The effectiveness of the voucher training programs:
A systematic review of the evidence from evaluations

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Abstract

Voucher programs are seen as an appealing allocation mechanism for education and vocational training programs. Yet, research on the effectiveness of vouchers is scarce and the results of the available studies are often ambiguous. The aim of this paper is to systematically review studies on the effectiveness of voucher training programs, to provide a summary of their findings and to draw some lessons on best practices.

We have limited our study selection to quantitative evaluation studies whose primary outcomes of interest were utilization/redemption of training vouchers, participation and completion of training as well as labour market outcomes (earnings, employability, job mobility/stability). For comparability of results we have only selected studies that have used either an experimental setting through randomized assignment of vouchers or any other quantitative techniques to identify causal effects. Our final selection consisted of fifteen studies evaluating the outcomes of seven different voucher programs in different countries.

Our review shows that there is no real agreement on the effectiveness of training vouchers on employment and earnings. Some even find a negative effect in the short run. The evidence shows that some subgroups of treated individuals (like individuals not holding a vocational degree and those participating in a degree program) may benefit more but they also redeem the vouchers less frequently. There is also some indicative evidence that such programs may come with a relatively high deadweight loss. Longer time horizons are needed to better estimate the effects.
1. Introduction

Voucher programs are seen as an appealing allocation mechanism for public policy interventions in general and for education and training programs in particular (Belfield & Levin, 2005; Bruttel, 2005; Cave, 2011; Lepenies, 2004; Orszag & Snower, 2000; Poeschel, 2014; Rinne, Uhendorff, & Zhao, 2013; Schwerdt, Messer, Woessmann, & Wolter, 2012; Steuerle, 2000; Valkama & Bailey, 2001; Winterhager, Heinze, & Spermann, 2006). Yet, research on the effectiveness of voucher-based programs is scarce and the effectiveness of vouchers as a allocation mechanism for adult training programs remains questionable (Bruttel, 2005; Doerr, Fitzenberger, Kruppe, Paul, & Strittmatter, 2014; Hidalgo, Oosterbeek, & Webbink, 2014; Kaplan, Novella, Rucci, & Vazquez, 2015). It seems that the relatively low incidence of voucher training programs coupled with data problems and the inability to track participants over a reasonably long time period have limited the number of effectiveness studies in this field.

This study presents the results of a systematic review of published papers and articles that evaluate the effectiveness of voucher-based labour market interventions delivering professional training for the youth, employed persons or the unemployed. We give an overview of the effectiveness of voucher programs based on evaluation studies that have used either an experimental setting for the randomized assignment of training vouchers or any other known econometric technique to identify causal effects. We also identify the main factors that contribute to the success of such programs and that can be used in the future to design more effective voucher-based adult training programs.

Training vouchers constitute one of the instruments that governments use, or consider, when trying to stimulate adult learning. The principle behind training vouchers is that they provide recipients with an earmarked budget, which can be spent on training courses. With this instrument workers have the freedom to choose from a specific list of courses in which they can enroll. The voucher also gives rights to all voucher recipients to participate, thus avoiding “cherry picking” by training institutions or employers. As with other labour market interventions, training vouchers are usually funded through public funds and payroll taxes and aim to increase the allocative efficiency of the vocational training market (such as in the case of giving individuals multiple alternatives for training) (Levin, 2002; Meurs, Puhani, & Von Haaren, 2015; Wise & Darling-Hammond, 1983), adjust any distributional outcomes (as in the case of giving all equal chances to participate in the training programs) (Bettinger, Kremer, & Saavedra, 2010), and enhance competitiveness in the adult training market (as in increased competition between training providers) (Bruttel, 2005; Epple & Romano, 1998; Figlio & Hart, 2014). Alternatively, training vouchers may adjust for market failures such as monopoly situations, distortions related to regulatory frameworks, low levels of services, or difficulties in adjusting to consumer demand (Winterhager et al., 2006).
On the other hand, critics of the voucher programs argue that the condition that individuals are well informed (both on own abilities and also on future benefits) is not always realistic (Kaplan et al., 2015), is associated with additional costs and can be a source of inequities. Publicly funded voucher programs may also crowd out private funds that otherwise would have been spent for the same purpose, and thus increasing the deadweight loss of such programs. Moreover, cream-skimming may by implementing agencies be an associated problem in voucher allocation (Schwerdt et al., 2012).

The advantages and disadvantages of the voucher programs show that even if they are useful instruments they also impose costs. With scarce resources for adult education and training, it is crucial to rigorously assess whether these programs are successful in improving employment opportunities and whether they provide gains in earnings for those who participate in them in an efficient way. Hence, evaluating them can provide guidance about when to introduce them, and how to design and implement them. At the same time, evaluations can also suggest under what conditions voucher programs should be adopted, or for some of them, even be abandoned. To the best of our knowledge, no study has so far reviewed the effectiveness of voucher training programs. Therefore this study will be the first to shed the light on the overall effectiveness of training vouchers from a global perspective.

2. Theoretical considerations

2.1. The definition of vouchers

There is no widely accepted formal definition of voucher programs, though most papers emphasize important elements of the vouchers such as: (i) vouchers are usually represented in a written, digital or any other form that is an alternative to direct cash transfers; (ii) they entitle the carrier to a subsidy or discount (that can range from a certain percentage to the full price) and therefore always carry a money-equivalent price; (iii) the entitlement is valid over a tangible good or service that otherwise would be paid against a price set by the market (or government); (iv) the benefits can be reclaimed at certain suppliers that can be public or private (and they often need to be claimed within a pre-defined period of time).

One distinct characteristic of a voucher program is the separation of the provision of public services from its financing. The funding remains with the government in the form of a voucher issued to individuals, entitling them to exchange the vouchers for services at a range of suppliers. The individual voucher-holder chooses among the different suppliers and pays them with the voucher. Vouchers can take at least three main forms: explicit, implicit or through the reimbursement of expenditures (either directly through subsidies or through tax credits) (Wells & Zunz, 2009). An explicit voucher is a physical coupon or smart card, which is presented to the supplier of the services who in return can exchange it for cash from a government body. An implicit voucher takes the form of a qualifying recipient choosing from a number of designated suppliers and, upon registering with one of them, the government pays directly to the provider of the service. The third form is for
the government to reimburse the user for expenditures on qualifying services from approved suppliers. This would most often be through the tax system, but can equally take the form of a traditional government expenditure program. From the point of view of the user, these three main forms offer a choice of suppliers with the government financing the service.

**Box 1. Definitions of vouchers from the literature**

“... (education) vouchers represent (governments finances given to parents) redeemable for a specified maximum sum per child per year if spent on "approved" educational services.” (Friedman, 1963)

“Grants earmarked for particular commodities, such as medical care or education, given to individuals” (Rosen, 2004)

A voucher has been defined as a token that may be exchanged for goods or services (Lamming & Bessant, 1988)

“A voucher is a subsidy that grants limited purchasing power to an individual to choose among a restricted set of goods and services.” (Steuerle, 2000)

“The definition ... (employed in this study) is any program through which a set amount of public funds is made available to a family to spend at the public or private educational institution of its choice”(McDermott, 2000)

The distribution through vouchers is defined as “regimes in which individuals receive (pay for or are allocated) entitlements to a good or service which they may “cash in” at some specified set of suppliers, which then redeem them for cash or the equivalent from a funding body” (Cave, 2011) (pg. 59).

“A voucher is a digital representation of the right to claim goods or services. A voucher has three necessary elements; a voucher issuer, a voucher holder, the issuer's promise to the voucher holder” (Card, Kluve, & Weber, 2010; Fujimura, 2003).

Bradford (1999) notes that the differences between vouchers programs and others are not absolute but voucher programs are mainly distinguished by the following characteristics: (i) funds are granted directly to consumers and not to suppliers (even though sometimes expenditures are reimbursed directly to suppliers but on behalf of specific consumers), (ii) the program allows the consumer to have an intermediate choice (i.e., the consumer is free to choose between a range of previously agreed providers which all deliver a service that fits to the specifics agreed by the program), (iii) there exists some degree of competition between the different providers (however the extent of the competition may vary depending on the particular conditions of the market and the regulations imposed),
and (iv) there is a declining marginal reimbursement rate on the reimbursement of the expenditures of the program (an exemption of this feature are voucher programs that provide a flat reimbursement rate – like, say, the income tax deduction on education expenditures).

2.2. **The theoretical arguments behind the use of vouchers in adult education and training interventions**

The rationale behind voucher programs for adult training is similar to vouchers for education programs, brought forward by Friedman (Friedman, 1963). Friedman proposed to provide parents with education vouchers that could be redeemed at a list of “approved” education institutions. According to Friedman vouchers would carry a fixed amount per student per year and parents would have free choice in purchasing education from the approved institutions. In Friedman’s logic, institutions offering educational services could be either for-profit and privately operated enterprises, or different types of not-for-profit institutions. The advantages of the voucher programs are usually summarized in the efficiency and equity gains they are presumed to deliver.

The ability of consumers of education services to choose among possible suppliers increases competitiveness and thereby increases the probability of delivering high-quality services at the lowest cost (Bettinger et al., 2010; Steuerle, 2000). In fact, economists have claimed that the possibility of maximizing consumer choice is the biggest advantage of the vouchers. It is argued that this maximizes utility and in return contributes to maximizing the social welfare function (Barnow, 2009; Card et al., 2010). On the other hand, the increased choice of providers is expected to have an effect on competition among providers (Card et al., 2010). And this, in turn, is argued to enhance efficiency in training delivery (increased competition for participants among providers will lead to the survival of the fittest) and also of the quality of the training (Card et al., 2010).

Another argument in favor of the voucher interventions is that they simplify the training choice process and improve the performance of training organizations (Card et al., 2010). Vouchers are also advocated as they are thought to address important problems such as: (i) tackle distributional issues, (ii) have positive externalities, (iii) address market failures or (iv) demonstrate paternalism (Card et al., 2010). Hence, contrary to other forms of transfers or tax credits, vouchers focus on specific needs that otherwise may not be met by a household or individual who faces a severe budget constraint and may thus help to redistribute resources to where they are more needed. By focusing on the activities that benefit not merely the recipients of the vouchers (think of education vouchers), vouchers have positive externalities that otherwise may not be realized. Moreover, vouchers may be adjusted for market failures such as monopoly situations, distortions related to regulatory frameworks, low supplied services, or difficulties in adjusting to consumer demand. The paternalistic feature of the vouchers ensures that beneficiaries will engage in the intended activity (which is not ensured by the unconditional cash transfers or the tax credits).
However, despite all the theoretical advantages listed above, one of the most important conditions for voucher programs to be effective is that individuals are well informed (Kaplan et al., 2015). The overall efficiency of the vouchers programs may be questioned in the absence of information about: (i) the quality of the services offered by the provider, (ii) one’s own abilities to benefit from the program or (iii) of the expected future benefits (like the expected wages or employment prospects in case of a voucher training program) (Barnow, 2009). To overcome this potential risk, and considering that gathering information might be expensive for individuals with low levels of human capital, an alternative to allowing individuals to choose a training program is to request information from local workforce agencies or to ask workers to demonstrate knowledge about their decision before training takes place (Steuerle, 2000).

Moreover, voucher opponents argue that voucher programs cream skim the best students and that vouchers can increase inequities if selection into voucher programs falls along racial or economic divides. Another claim (especially given that public provision programs are competing against private ones) is that the increased availability of education or training may reduce further enrollment rates at public providers and hence intensify the fiscal strains felt by public centers or schools.

Given that voucher for trainings are generally financed by public funds another key concern here is whether public funds may crowd out private funds that otherwise would have been spent for the same purpose (i.e., whether increased participation in courses induced by the public voucher program comes partly at the detriment of adult training courses that would otherwise have been financed by employers). This result casts further doubt on the overall effectiveness of public policies in raising adult education (Schwerdt et al., 2012).

In his review of voucher programs across developing and developed countries, West (1997) also identifies fraud as a frequently cited challenge faced by governments keen on introducing voucher programs.

### 2.3. Evaluation aspects of training vouchers programs

In general, vocational training programs are used to adjust the skills of the unemployed to the changing requirements of the labor market and to improve the employability of the individual (impaired because of health problems, for example). The goal is to improve the human capital and productivity of the participants. Participation may have various benefits on the employability, earnings, duration of employment, etc. Short-term courses usually last from a limited number of hours until to one or two months. Long-term training courses typically last several months to one year. Teaching takes place in classrooms or on the job. The course curriculum may also include internships. Typical examples of training schemes are courses on IT-based accounting or on customer orientation and the sales approach.
There are two types of scientific evaluations of the voucher training programs: experimental and quasi-experimental. Experimental or classically designed evaluations require assignment of both the "control" and "treatment" groups - those who receive the assistance and those who do not - prior to the intervention. If a large numbers of individuals are randomly assigned to treatment and control groups, average characteristics of the two groups should not differ significantly. Thus, any difference in outcomes can be attributed to program participation. Quasi-experimental studies, identify treatment and control groups after the intervention. To compute the effectiveness of the program, statistical techniques are used that correct for differences in (un)observable characteristics between the two groups.

While randomization is thought to ensure the absence of selection bias among participants, proponents of randomized experimentation argue that the method relies heavily on a rather controversial assumption, i.e. the randomization does not alter the behavior being studied. This may not be the case, and in fact the bias induced by randomization may be quite strong (James J Heckman, 1992). For instance, individuals who are deemed eligible for the training may have already made plans anticipating enrollment in training. With a randomization process they may change their decision to apply or undertake activities complementary to training. Thus there will be a higher probability that risk-averse persons will be eliminated from the program.

In the quasi-experimental techniques, the treatment and control groups are selected after the intervention. In order to determine the effect of the program, econometric techniques correct for the differences in characteristics between the two groups. The main advantages of this technique lie in relatively low costs that allow the interventions to be conducted at any time. The main drawback is that these techniques are statistically complex. Attributes of individuals in treatment and control groups are different. The techniques for adjusting for differences in observable attributes (e.g., sex, education, age, region) are relatively straightforward but subject to specification errors and correcting for unobservable characteristics (e.g., motivation, family connections) requires additional statistical computing procedures that can yield widely different results (James J Heckman, 1992).

Any attempt to quantify the effects of adult education and training vouchers faces the fundamental problem of selection bias, because adults choosing to participate in education are likely to differ from adults choosing not to participate. These differences relate to the labor market success even without the training itself. Estimating the effect on earnings of an employment program using randomized and quasi-experimental techniques, (LaLonde, 1986) has shown that randomized experimentation yields significantly different results from quasi-experimental techniques. Policymakers should be aware that available non-experimental evaluations of training programs may be hampered by large biases (James J. Heckman & Hotz, 1989).

3. The search strategy and search results
The main aim of the systematic search was to identify studies evaluating the effectiveness of labour market interventions that consisted in delivering professional training for the unemployed through the use of voucher programs. The evaluation studies were limited to those whose primary outcomes of interest were utilization/redemption of training vouchers, participation and completion of trainings as well as labour market outcomes (earnings, employability, job mobility/stability). For the sake of comparability of results we have selected only studies that have used an experimental setting, a randomized assignment of vouchers or any other quantitative techniques in measuring the effects.

The search used the following keywords:
- Vouchers
- High education
- Training
- Labour market
- Job promotion
- Job placement
- Effectiveness studies

The databases searched include JSTOR, Econlit, EconPapers, Google Scholar, Web of Science, SpringerLink and Wiley Online Library. In addition, databases listing working paper series were also scrutinized, including: the National Bureau of Economic Research (NBER), EconStor, IDEAS, Institute for the Study of Labor (IZA), The Centre for Economic Policy Research (CEPR), Social Science Research Network (SSRN) as well as World Bank working papers. References of the identified articles were scrutinized for additional references.

The selection of the studies was done through pre-developed inclusion criteria. Only economic papers that included a quantitative evaluation (based both on experimental or observational data) of the effectiveness of voucher-based interventions for adult training were considered. All studies that were outside of the review scope, (i.e. reviews, theoretical and model-based papers, non-quantitative evaluations and editorials) were excluded. The first author performed the search and classification of the retrieved articles. Data extraction included: authors, year of publication, type of intervention, country of analysis, quantitative methods used, main comparator(s), costs of the program, outcomes as well as the main findings.

Figure 1. The selection process
The search retrieved 434 citations, which were reduced to 277 after excluding duplicates and non-English language citations. After screening titles and abstracts 24 articles (Figure 1), were further scrutinized to exclude papers that fell outside the scope of the review. The remaining references (15 studies) were included in the review. Table 1 gives the general study characteristics of the selected publications for this review.
<table>
<thead>
<tr>
<th>No.</th>
<th>Author/Year</th>
<th>Country/Program</th>
<th>Target population</th>
<th>Treatment and Control groups</th>
<th>Outcomes of Interests</th>
<th>Methods</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>(Attanasio, Kugler, &amp; Meghir, 2011)</td>
<td>Colombia, a randomized experiment using Jóvenes en Acción (JeA) training program for urban young unemployed in the early 2000s</td>
<td>The urban young unemployed</td>
<td>The urban young unemployed in Colombia. Treatment/control: Randomly assigned</td>
<td>Formal Labour Sector (FLS) Income Probability of working in FL Probability of working in a large firm in FL Monthly earnings contributions to social security</td>
<td>Regression</td>
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<td>2</td>
<td>(Doerr &amp; Kruppe, 2015)</td>
<td>Germany (vouchers as ALMP)</td>
<td>All individuals in Germany who received and made use of occupation-related or general training.</td>
<td>Treatment: Individuals who used the training voucher in Germany Individuals receiving a training voucher and making use of occupation-related or general training. No info on voucher receipt (only institutional effect is measured). Control: unemployed participants from the period before the reform</td>
<td>Employment Earnings</td>
<td>Inverse probability weighting (IPW) and ordinary least squares (OLS). Instrumental Variables</td>
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<td>3</td>
<td>(Görlitz, 2010)</td>
<td>Germany, Federal State of North Rhine-Westphalia; Bildungsscheck program (2006)</td>
<td>Employees who did not participate in training in the previous and in the current year</td>
<td>Treatment: Employees who were offered a training voucher in NRW area Control: Other German regions or NRW before Jan 2006</td>
<td>Training incidence Training intensity conditional on the investment decision</td>
<td>Difference-in-difference</td>
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<td>4</td>
<td>(Görlitz &amp; Tamm, 2015)</td>
<td>Germany (vouchers as ALMP)</td>
<td>Individuals who used the voucher to participate in training, (but whose training course had not already started</td>
<td>Treatment: Individuals receiving a training voucher and making use of occupation-related or general training. No info on voucher receipt (only institutional effect is measured).</td>
<td>Employment Earnings</td>
<td>Matching (double)</td>
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<td>5</td>
<td>(Hidalgo et al., 2014)</td>
<td>Netherlands, a randomized experiment distributing training vouchers to low-skilled workers in The Netherlands</td>
<td>All employees in sectors like (animal husbandry &amp; greenhouse horticulture; (2) potatoes, vegetables and fruit; (3) food industry; and (4) natural stone before the first interview).</td>
<td>Control: Individuals who obtained a voucher, but did not manage to redeem it. Treatment/control: Random conditional on the sector fund in which someone is working.</td>
<td>Training participation Type of training Earning Job mobility</td>
<td>Regression</td>
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<td>6</td>
<td>(Hicks, Kremer, Mbiti, &amp; Miguel, 2011)</td>
<td>Kenya, Technical and Vocational Vouchers Program (TVVP), randomized program</td>
<td>Out-of-school youths (18 to 30 years old)</td>
<td>Treatment: Out-of-school youths (18 to 30 years old) participating in the program. Control: Youth that did apply but were not awarded a voucher</td>
<td>Impact of information intervention on application/enrollment/choice Retention Percentage of Vocational Education Course Completed Labour market outcomes</td>
<td>Participants’ attendance</td>
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<td>7</td>
<td>(Huber, Lechner, &amp; Strittmatter, 2015)</td>
<td>Germany (vouchers as ALMP)</td>
<td>Individuals receiving a training voucher and voucher redemption for participation in some vocational training course. Control: unemployed individuals without voucher award (and redemption) during the years 2003 and 2004</td>
<td>Voucher redemption employment stability,(employed for at least 6 months)</td>
<td>Propensity score matching</td>
<td></td>
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<td>8</td>
<td>(Gerards, De Grip, &amp; Witlox, 2014)</td>
<td>Netherlands, a firm-sponsored training (“Employability-miles”)</td>
<td>All employees of the selected form.. Treatment: employees using the vouchers All employees, guaranteeing training supply.</td>
<td>Voucher use Employability awareness Willingness to train</td>
<td>Regression</td>
<td></td>
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<td>No.</td>
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<td>9</td>
<td>Kaplan et al., 2015</td>
<td>Chile, the program Bono Trabajador Activo, a training voucher program.</td>
<td>Lower (&lt;1200$) wage employee with at least 12 months experience and 6 months contributions. Treatment: Applicants whom were awarded a voucher and enrolled in a training course. Control: Applicants whom were awarded a voucher but did not take a training course.</td>
<td>Employment, Employment duration, Earnings</td>
<td>Difference-in-difference Instrumental Variables</td>
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<td>10</td>
<td>McVicar &amp; Polidano, 2015</td>
<td>Australia, broad-based voucher in VET in Australia; natural experiment</td>
<td>Students of post-secondary VET courses 15 to 19 year-olds.</td>
<td>Alignment of course choice with skill demand and academic achievement, Estimated wage</td>
<td>Difference-in-difference</td>
<td></td>
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<td>11</td>
<td>Messer &amp; Wolter, 2009</td>
<td>Switzerland (Randomized experiment using Swiss Labor Force Survey (SLFS))</td>
<td>Past participants of SLFS.</td>
<td>Voucher redemption/utilization, Employer participation</td>
<td>Regression</td>
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<td>12</td>
<td>Poeschel, 2014</td>
<td>Germany (vouchers as ALMP)</td>
<td>All individuals in Germany who received and made use of occupation-related or general training.</td>
<td>Employment</td>
<td>Matching</td>
<td></td>
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<td>13</td>
<td>Paul, Dörr, Fitzenberger, Kruppe, &amp;</td>
<td>Germany (vouchers as ALMP in 2003/4).</td>
<td>All individuals in Germany who received a training</td>
<td>Employment</td>
<td>Matching</td>
<td></td>
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<tr>
<td>No.</td>
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<td>14</td>
<td>Strittmatter, 2013</td>
<td>Germany (vouchers as ALMP)</td>
<td>All individuals in Germany who received and made use of occupation-related or general training.</td>
<td>Treatment: Individuals who used the training voucher in Germany Individuals receiving a training voucher and making use of occupation-related or general training. Control: unemployed participants from the period before the reform</td>
<td>Employment Earnings</td>
<td>Matching (double)</td>
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<td>15</td>
<td>Rinne et al., 2013</td>
<td>Switzerland (Randomized experiment using Swiss Labor Force Survey (SLFS))</td>
<td>Past participants of SLFS.</td>
<td>Treatment: SLFS participants interviewed in 2005 (and before) but not scheduled to be interviewed in 2006. Control: SLFS participants interviewed both in 2005 and 2006 and 2007.</td>
<td>Participation in adult education Earnings Employment Subsequent adult education</td>
<td>OLS Instrumental variable</td>
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</table>
4. Main characteristics of voucher programs in the chosen studies

The studies in the review included the evaluation of eight different voucher programs or experiments: the Colombian Jóvenes en Acción program (JAP); the German training vouchers under the HARTZ reform; one Dutch training voucher experiment; the Chilian training vouchers for the Bono Trabajador Activo (BTA); the Australian Victorian Training Guarantee (VTG), the Swiss randomized field experiment with vouchers for adult training; the Argentinian Proempleo Experiment (APE) as well as a Technical and Vocational Vouchers Program (TVVP) in Kenya. Appendix 2 gives a short description of each of the programs.

The main goal of the selected training voucher programs was to increase the employability of the participants (Attanasio, Guarín, Medina, & Meghir, 2015; Attanasio et al., 2011; Doerr et al., 2014; Galasso, Ravallion, & Salvia, 2004; Gerards et al., 2014; Görlitz, 2010; Görlitz & Tamm, 2016; Hicks et al., 2011; Hidalgo et al., 2014; Huber et al., 2015; McVicar & Polidano, 2015; Messer & Wolter, 2009; Poeschel, 2014; Rinne et al., 2013) but also to increase the chances to access better quality jobs (Kaplan et al., 2015).

The target of the interventions varied greatly as the selected voucher programs aimed to cover different segments of people needing or planning to undergo training or on-job experience. These included specific groups like unemployed young people (Attanasio et al., 2015; Hicks et al., 2011; McVicar & Polidano, 2015), low-income or low-skills employees (Gerards et al., 2014; Görlitz, 2010; Görlitz & Tamm, 2016; Hidalgo et al., 2014; Huber et al., 2015; McVicar & Polidano, 2015; Messer & Wolter, 2009; Poeschel, 2014; Rinne et al., 2013) but also more general groups like the unemployed job seekers (Doerr et al., 2014; Huber et al., 2015; Poeschel, 2014; Rinne et al., 2013) or also more generally employees who were randomly assigned into a voucher program (Messer & Wolter, 2009; Schwerdt et al., 2012).

The setup of the programs also differed between programs. The amount of the voucher, the other supporting programs and benefits, the selection of the providers and the duration of the training were some of the main distinguishable features.

4.1. The setup of the programs

Programs targeting youth – Voucher programs targeted to the youth were generally programs that offered medium to longer term training (from three months in case of the Colombian (JAP) up to a full-time course in case of the Australian (VTG)). The program contents are complemented by on-the-job internships as in the case of the Colombian JAP (Attanasio et al., 2015). In addition, often beneficiaries also receive a food and transportation allowance (Attanasio et al., 2015). In a similar way the extra subsidies were also available to colleges to meet the extra cost of catering for ‘high needs learners’, such as indigenous students in the Australian VTG (McVicar & Polidano, 2015).
The youth generally received vouchers for training allowance, which they can use to enroll in a training course of their choice from a list of competitively selected providers or from a list of provided courses.

**Programs targeting low-income or low-skilled workers** – The selected voucher programs for the low-income or low-skilled usually consisted of a grant that allowed workers to choose labor-training courses from a predetermined list. The assignment and the procedure for the redemption of the voucher differed between the programs but despite the differences all the programs shared similar features namely: (i) employment status; (ii) contribution to social security; (iii) earning a low wage or (iv) considered to have low skills. Hence, in Chile to be eligible for the voucher, applicants of the “Bono Trabajador Activo” had to be employed, be at least 18 years old and no more than 60 for women and 65 for men and have had contributed to social security at least 12 months during their professional lives. In a different setting, but yet similarly, an experimental voucher program in the Netherlands targeted employers of sectors like animal husbandry and greenhouse horticulture; growers of potato, vegetables and fruit; workers in the food industry; and workers in the natural stone industry.

In Chile the training took place in technical training organizations (Kaplan et al., 2015) and the training courses lasted between 80 and 140 hours (distributed, on average, over a 6-month period) (Kaplan et al., 2015). In the Netherlands each selected individual received €1000 for a training of choice.

**Programs targeting unemployed job seekers** - The most representative voucher program among the selected publications for the unemployed job seekers is the German voucher program. Here the main eligibility criteria was being unemployed. The caseworker denoted the objective, content, and maximum duration of the course on the voucher. The unemployed individual could choose a course offered by an eligible training provider that was located within a one-day commuting zone subject to the restrictions denoted on the voucher (Doerr et al., 2014; Görlitz, 2010; Görlitz & Tamm, 2016; Huber et al., 2015; Messer & Wolter, 2009; Poeschel, 2014; Rinne et al., 2013).

**Experiments targeting randomly assigned employees** – In the experimental voucher interventions, the participants are randomly assigned from the general labour force (as in the Swiss study (Messer & Wolter, 2009; Schwerdt et al., 2012)), from participants of a particular workfare program (Galasso et al., 2004), or from a particular sector (as explained in the Dutch experiment (Gerards et al., 2014; Hidalgo et al., 2014)). Hence, the Swiss experiment used the Swiss Labor Force Survey (SLFS) data to randomly assign vouchers. The Argentinean’s APE took a random sample of Trabajar workers who received a voucher that entitled them to training or job placement.

**4.2. The monetary value of the voucher and characteristics of the participants**

The amount of the voucher differed greatly between the programs. Figure 1 gives an indication for the studies where such monetary value was explicitly mentioned. As it can
be observed, the value of the voucher varied from €500 (PPP adjusted) to around €2000 (PPP adjusted). The Swiss study is an exception being an experiment as the value of the randomly assigned voucher varied from €272 to €2046 (PPP adjusted).

Figure 1. Monetary value of the vouchers (in PPP Euros)

Note: The Swiss study (Messer et al. 2009) gave three different values to randomly selected participants.

Unfortunately, not all the studies report an explicit monetary amount for the vouchers offered. Moreover, some of the programs also cover for extra costs, like the accommodation costs, etc.

Figures A1-A5 in the appendixes show the characteristics of the participants in the selected studies. The

4.3. The methodology used in the evaluations

The design of the selected evaluation studies can be broadly divided in experimental and non-experimental studies. Table 1 shows that the studies that employed an experimental design (Attanasio et al., 2015; Galasso et al., 2004; Hidalgo et al., 2014; Messer & Wolter, 2009; Schwerdt et al., 2012) used linear regression to estimate the effects of the random assigned vouchers. The other studies that used secondary sources of data (like administrative data and surveys) to estimate the effect of vouchers used a mix of methods varying from difference-in-differences, matching techniques, regression discontinuity and instrumental variables.

The main outcomes of interests included voucher redemption/utilization employment, earnings, employer participation, participation in adult education, etc. A complete list of the outcomes of interests for each of the studies is given in Table 1.

The differences in the sample size between control and intervention groups also varied a lot between the studies (see Figure 2) depending on the sources of the data and the scale of the study.
4.4. The effects of the voucher programs on the main outcomes

1.1. Utilization/redemption of training vouchers

The numbers in Figure 3 show the take up rates and utilization of the vouchers. As can be seen, the figures vary greatly between programs. Hicks (Hicks et al., 2011) finds that 74% of the individuals that were offered a voucher attended a training program for at least one term the program, which illustrates the strong interest among the youth in Kenya. Unfortunately, this finding is not confirmed by the other Australian study also focusing on youth (Kaplan et al., 2015).

The other studies report redemption rates that vary between 18 and 40 per cent of the total allocated number of vouchers.

Figure 3 Redemption rates for the vouchers.
4.5. Participation in trainings

Table 1 also shows the extraction of the data for the participation effects of the vouchers on the training program, both in terms of the probability and the intensity of participation. The data show that the highest impact of voucher programs is on the participation incidence and the intensity of participation. The effect on the incidence varies from a 3.3 percentage points increase to almost 20 percentage points and it remains always positive. The effect on the intensity of the participation is also positive.

4.6. Labour market outcomes

The main objective of almost all the selected voucher programs was to increase earnings and employability of the participants. Results in table 2 show that it is not always clear whether the voucher programs increase earnings and employability. The results are especially small or negative when the follow-up period is rather short. Hence for Germany, Rinne et al. (Rinne et al., 2013) analyze the impact of the Hartz reform implemented in 2003, which introduced training vouchers and imposed more selective criteria on the applicants. The authors estimate the overall reform effect and then decompose it into a voucher effect and an assignment effect. They find positive effects of the voucher on employment, measured at 12 and 18 months after starting in the program. Also for Germany, Doerr et al. (Doerr et al., 2014) estimate the average causal effect of the voucher on the employment probability and monthly earnings for individuals who were awarded a voucher. The authors find positive effects on employment and earnings after a period of four years. Their results indicate that after four years of being awarded a training voucher, recipients are 1 to 2 percentage points more likely to be employed, but they earn less than comparable non-recipients.

The evidence from low and middle-income countries shows similar trends. Hence, Hicks et al (Hicks et al., 2011) found that one year after participation the probability of employment (in the formal sector) decreased by 3.7 percentage points in Kenya. Similar trends were found also by Kaplan et al (Kaplan et al., 2015) in Chile. Athanasio et al
(Attanasio et al., 2015) on the other hand find positive outcomes for the Argentinian program on both employment and earnings of the participants after two years followed.

The findings show that there exists a lot of heterogeneity in the groups that benefit from the voucher programs. Hence, Kaplan et al found that the BTA program had differential effects by gender and level of education. In particular, the BTA had a larger (and positive) effect on females compared to male employment and earnings, and it had a more negative effect on lower educated than on higher educated individuals (see also Figures A6-A7 in the Appendixes).

4.7. The deadweight loss of the voucher programs

Some of the selected studies in our analysis also estimate the deadweight loss of the voucher programs. This relates to the costs because of voucher redemption by those who would have participated in adult education anyway, thereby raising the overall cost of any public program (Hidalgo et al., 2014; Messer & Wolter, 2009; Schwerdt et al., 2012). The results show that there is a relatively large share of always-takers who would have participated in training courses even without the voucher program. Hence the deadweight loss varies from 30 to 59 per cent, reaching the highest value in the experimental studies, like in Switzerland (50 percent) and in the Netherlands (59 percent).
Table 2. Summary of the main findings for the selected studies

<table>
<thead>
<tr>
<th>Author/Year</th>
<th>Country/Program</th>
<th>Follow-up (years)</th>
<th>Formal earnings</th>
<th>Probability of employment (formal sector)</th>
<th>Effects on Training Incidence</th>
<th>Effects on Training Intensity</th>
<th>Deadweight loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Attanasio, Kugler et al. 2011)</td>
<td>Colombia</td>
<td>2</td>
<td>13,6%</td>
<td>4,0%</td>
<td>5,9%</td>
<td>0,3%</td>
<td></td>
</tr>
<tr>
<td>(Doerr and Kruppe 2015)</td>
<td>Germany</td>
<td>4</td>
<td>n.s.s. (-)</td>
<td>2,0%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Görlitz 2010)</td>
<td>Germany</td>
<td></td>
<td></td>
<td>1,0%</td>
<td>4,0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Görlitz and Tamm 2015)</td>
<td>Germany</td>
<td>2</td>
<td>-1,0%</td>
<td>5,9%</td>
<td>0,3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Hidalgo, Oosterbeek et al. 2014)</td>
<td>Netherlands</td>
<td>2</td>
<td>n.s.s. (-)</td>
<td>19,6%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Hicks, Kremer et al. 2011)</td>
<td>Kenya</td>
<td>1</td>
<td></td>
<td>-3,7%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Huber, Lechner et al. 2015)</td>
<td>Germany</td>
<td>4</td>
<td></td>
<td>3,0%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Gerards, De Grip et al. 2014)</td>
<td>Netherlands</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Kaplan, Novella et al. 2015)</td>
<td>Chile</td>
<td>1</td>
<td>-12,0%</td>
<td>-0,6%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Hidalgo et al. 2014)</td>
<td>Netherlands</td>
<td>1</td>
<td></td>
<td>20,0%</td>
<td></td>
<td>59%</td>
<td></td>
</tr>
<tr>
<td>(McVicar and Polidano 2015)</td>
<td>Australia (expected)</td>
<td>2</td>
<td>22,0%</td>
<td>3,3%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Messer and Wolter 2009)</td>
<td>Switzerland</td>
<td>1</td>
<td></td>
<td>20,0%</td>
<td></td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td>(Poeschel et al. 2014)</td>
<td>Germany</td>
<td>2</td>
<td></td>
<td>20,0%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Paul, Dörr et al. 2013)</td>
<td>Germany</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Rinne, Uhlenendorf et al. 2013)</td>
<td>Germany</td>
<td>1,5</td>
<td>10,0%</td>
<td>10,0%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Schwerdt, Messer et al. 2012)</td>
<td>Switzerland</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>30%</td>
<td></td>
</tr>
</tbody>
</table>

Note: The effects are given as the effect on the treated (voucher) in percentage points: n.s.s. – Not statistically significant
5. Discussion

Training schemes are a popular instrument of labour market interventions aimed at enhancing the employability of jobless people or to increase prospective wages of low-earning and low-skilled people. The main rationale behind the use of such instrument is that training has a direct effect on both employment chances and prospective earnings (Meager, 2009). The utilization of vouchers for allocating participants to training centers has also been advocated as a mean to increase efficiency of the interventions (Friedman, 1963) in two ways; (i) by enabling informed workers to choose the most beneficial training program and (ii) by increasing competition among the training providers and hence improving quality of the training (Kaplan et al., 2015; Meurs et al., 2015; Poeschel, 2014). The current study systematically reviewed the results of evaluations focusing on professional training programs for the youth, low skilled, low-waged or unemployed and that make use of vouchers.

The review was limited to evaluation studies whose primary outcomes of interest were utilization/redemption of training vouchers, participation and completion of training as well as labour market outcomes (earnings, employability, job mobility/stability). We selected only studies that used an experimental setting, a randomized assignment of vouchers or any other quantitative techniques in measuring causal effects. The final selection consisted of fifteen studies evaluating the outcomes of seven different voucher programs.

The review of our selected studies showed that while there are mixed findings in terms of the effectiveness of the voucher programs, there is a consistent positive trend regarding the participation incidence and the intensity of participation. This trend was confirmed in many of the selected studies (Gerards et al., 2014; Hicks et al., 2011; Hidalgo et al., 2014; Messer & Wolter, 2009; Schwerdt et al., 2012). This finding confirms what previous studies have found. Two reviews of active labour market policies from the World Bank mention that, generally, providing vouchers that cover program costs does encourage enrolment and that those who can use the voucher for a private training program are more likely to sign up and stay in school (Betcherman, Dar, & Olivas, 2004; Dar & Tzannatos, 1999). So, from this perspective vouchers can be seen as a means to increase participation and in this regard the involvement of the private sector may reinforce such effects. Hicks et al. (Hicks et al., 2011) find similar results in the context of a developing country. However, one has to interpret such findings with caution. Hence, Gerards et al (Gerards et al., 2014) pointed out that voucher use is higher for workers with a more internal locus of control, as well as higher levels of goal setting, career ambition, education, and tenure. Furthermore, Hidalgo et al. (Hidalgo et al., 2014) mentioned that that recipients more often participate in training that is general instead of specific which may potentially affect the overall results of the training.

The findings from our selected studies suggest that the existing empirical evidence on the effect of training vouchers is not conclusive regarding whether such instrument is more
effective than alternative ones (e.g., programs where assignments to training are made by
the government or other agents) in terms of employability and wages. In fact, some of the
reviewed studies found negative effects on employment (at least in the short-term) (Hicks
et al., 2011; Huber et al., 2015; Kaplan et al., 2015) and also on wages (Doerr et al.,
2014; Görlitz & Tamm, 2016; Hidalgo et al., 2014; Kaplan et al., 2015) (though such
effects were not always statistically significant). The negative effects on employment and
earnings coincide with previous findings in the literature stating that individuals who took
training courses through vouchers have worse labor outcomes than those who did not
(Corson et al., 1993; Dickinson and West, 1983; McConnell et al., 2006). The reasons
behind such negative outcomes may vary. Doerr et al. (2014), argue that the negative
effect of the voucher in the short-term could be the result of a lock-in period for
participation in the program (i.e., individuals reduce the intensity of job search or
accepting job offers). Hidalgo et al. (2014) mentions that this may be due to the short
time spell elapsed between training participation and the moment wages are measured.
Or, that it may also be due to the relatively small size of the investment (e.g., an
investment of €1000 is not an ignorable amount, but yet too small to realistically translate
into a wage increase of more than some tenths of a percent) (Hidalgo et al., 2014). One
other reason for negative outcomes is that these programs generally target lower skilled
and less abled individuals (e.g. long-term unemployed) (James J. Heckman, Lalonde, &
Smith, 1999).

In fact, the literature on the effectiveness of training for the unemployed gives mixed
results. There is a general agreement that participants often benefit from these programs
in terms of higher employment rates but not in terms of higher earnings (Audhoe,
Hoving, Sluiter, & Frings-Dresen, 2010; Betcherman et al., 2004; Boone & Van Ours,
2004; Card et al., 2010; Dar & Tzannatos, 1999; Greenberg, Michalopoulos, & Robins,
2003; Kluve, 2010; Kuruscu, 2006; Meager, 2009; Regnér, 2002). Yet, such findings are
not completely uniform across different programs. Hence, training for the long-term
unemployed can help (especially when the economy is improving) (Betcherman et al.,
2004; Dar & Tzannatos, 1999). On the other hand, small-scale, tightly targeted on-the-job
training programs offer often appear to yield the best returns (Dar & Tzannatos, 1999;
Kluve, 2010). A recent meta-analysis of microeconometric evaluations of active labour
market policies by Card et al. showed that classroom and on-the-job training programs
are not particularly effective in the short run, but have more positive relative impacts
after two years (Card et al., 2010).

Furthermore, previous studies have shown that differences in effectiveness may also be
due to differences between the targeted groups. Hence, several studies have found the
earnings to be larger among women than for men, but not as large (or negible) among the
age cohorts (i.e., youth versus others) (Card et al., 2010; Greenberg et al., 2003; Kluve,
2010). Our result seems to confirm this later trend as often our selected studies found that
the effects were larger or positive for women than for men (Attanasio et al., 2015; Kaplan
et al., 2015; Rinne et al., 2013). Similarly, results were stronger for individual without a
vocational degree participating in degree courses. The evidence shows that some
subgroups of treated individuals (like individuals not holding a vocational degree and
those participating in a degree program) may benefit more but they also redeem the
vouchers less frequently. So heterogeneity in treatment effect should have a central role here.

In addition, one concern from the review of the selected studies was also the relatively large share of always-takers who would have participated in training courses even without the voucher program. Measured as the deadweight loss of the programs this varied from 30 to 59 per cent suggesting that such programs may also affect the effectiveness of the private investments (as in the case of employers paying for the training costs). However, one should consider that there is general agreement that public labour market programs have a relatively high deadweight loss. For instance Dar et al., 1999 report that estimates of deadweight losses varied from about 30 percent to about 50 percent in the self-employment experiments in the US, Canada, Denmark and Ireland (Dar & Tzannatos, 1999). Moreover, the results show that the highest value is reached in experimental studies (which in themselves did target all employees and therefore had a higher probability for higher deadweight loss values). We cannot say much about the other studies as these values were not reported in these studies.

Despite the fact that we have selected all the studies that fulfilled our inclusion criteria, some concerns about the reliability and robustness of the results in the studies selected remain. First, as mentioned above, previous studies on the returns to the active labour market programs show that such programs have lower outcomes in the short term and therefore a longer time horizon is needed to better estimate their impact. Indeed, it appears that many programs with insignificant or even negative effects after a year show significantly positive effects after 2 or 3 years. For instance, classroom and on-the-job training programs appear to be particularly likely to yield more favourable medium-term than short-term impact estimates (Card et al., 2010).

6. Conclusions

The results of this systematic review show that there is no real consensus to be reached on the effectiveness of training vouchers on employment and earnings. While most studies have found a positive effect of the vouchers on participation and intensity of training very few find positive effects on employment probabilities and wages, while some also find a negative effect in the short run. The evidence shows that some subgroups of treated individuals (like females or individuals not holding a vocational degree) may benefit more but reportedly redeem the vouchers less frequently. There is also evidence that such programs come with a relatively high deadweight loss. Given the short term horizon in most analyzed studies, we think that a better estimation of the effects requires longer follow up periods.
7. References


8. Appendixes

**Figure A.1.** Average share of females in the selected studies

<table>
<thead>
<tr>
<th>Study</th>
<th>Average Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Schwerdt, Messer et al. 2012)</td>
<td>0.56</td>
</tr>
<tr>
<td>(Rinne, Uhlendorff et al. 2013)</td>
<td>0.43</td>
</tr>
<tr>
<td>(Paul, Dörr et al. 2013)</td>
<td>0.44</td>
</tr>
<tr>
<td>(Messer and Wolter 2009)</td>
<td>0.56</td>
</tr>
<tr>
<td>(McVicar and Polidano 2015)</td>
<td>0.46</td>
</tr>
<tr>
<td>(Kaplan, Novella et al. 2015)</td>
<td>0.45</td>
</tr>
<tr>
<td>(Huber, Lechner et al. 2015)</td>
<td>0.46</td>
</tr>
<tr>
<td>(Hicks, Kremer et al. 2011)</td>
<td>0.63</td>
</tr>
<tr>
<td>(Görlitz and Tamm 2015)</td>
<td>0.79</td>
</tr>
<tr>
<td>(Doerr and Kruppe 2015)</td>
<td>0.45</td>
</tr>
<tr>
<td>(Attanasio, Kugler et al. 2011)</td>
<td>0.54</td>
</tr>
</tbody>
</table>

**Figure A.2.** Average age of the treated participants in the selected studies

<table>
<thead>
<tr>
<th>Study</th>
<th>Average Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Schwerdt, Messer et al. 2012)</td>
<td>41.426</td>
</tr>
<tr>
<td>(Rinne, Uhlendorff et al. 2013)</td>
<td>37.12</td>
</tr>
<tr>
<td>(Huber, Lechner et al. 2015)</td>
<td>39.03</td>
</tr>
<tr>
<td>(Görlitz and Tamm 2015)</td>
<td>38.16</td>
</tr>
<tr>
<td>(Attanasio, Kugler et al. 2011)</td>
<td>21</td>
</tr>
</tbody>
</table>
Figure A.3. Average education years of the treated participants in the selected studies

(Kaplan, Novella et al. 2015) 11.92
(Hicks, Kremer et al. 2011) 8.8
(Attanasio, Kugler et al. 2011) 10.2

Figure A.4. Share of individuals having finished vocational education in the selected studies

(Schwerdt, Messer et al. 2012) 0.487
(Messer and Wolter 2009) 0.099
(Görlitz and Tamm 2015) 0.64
(Doerr and Kruppe 2015) 0.108
Figure A.5. Share of individuals having finished university education in the selected studies

(Schwerdt, Messer et al. 2012) 0,116
(Rinne, Uhlendorff et al. 2013) 0,11
(Messer and Wolter 2009) 0,206
(Görlitz and Tamm 2015) 0,335
(Doerr and Kruppe 2015) 0,225

Figure A.6. Treatment effect for employment of females in the selected studies

(Schwerdt, Messer et al. 2012) -0,035
(Kaplan, Novella et al. 2015) 0,039
(Hicks, Kremer et al. 2011) -0,078
9. Annexes

**Appendix 1. Description of the voucher programs in the selected studies**

**Colombia - The Jóvenes en Acción program**
The Jóvenes en Acción program was a training program for urban young unemployed that was implemented in the early 2000s in Colombia as part of a wider strategy called Red de Apoyo Social, aimed at providing a safety net for the poorest sectors of the population after the crisis that hit the country in the late 1990s. It was targeted to unemployed youths 18 to 25, who belonged to the poorest population classified in the two lowest levels of a score, called SISBEN, which is used in Colombia to target all welfare programs. The program was implemented in the seven main cities of the country: Bogotá, Medellín, Cali, Barranquilla, Bucaramanga, Manizales and Cartagena. By 2005, it had enrolled 80,000 students.

Program’s goal - To increase the employability of the young beneficiaries.

Design and implementation - The youth received training allowance and vouchers, which they can use to enroll in a training course of their choice from a list of competitively selected providers. Job training lasts about three months and is followed by a three-month internship in a company or organization. Beneficiaries also receive a food and transportation allowance. The program is administered by a group of government agencies, non-profit organizations and private companies.

**Germany - Training Vouchers under the HARTZ reform**
The First Modern Services on the Labor Market Act (the so-called Hartz I Reform) introduced a voucher system for the provision of training for the unemployed in January 2003. First, the voucher specifies the objective, content, and maximum duration of the course. Second, it can only be redeemed within a one-day commuting zone. Third, the validity of training vouchers varies between one week and three months. Fourth, no sanctions (e.g. cuts in unemployment benefits) are imposed in case of non-redemption.

Program’s goal – To increase the employability of unemployed job-seekers.

Design and implementation - The caseworker denotes the objective, content, and maximum duration of the course on the voucher. The unemployed individual may then choose a course offered by an eligible training provider that is located within a one-day commuting zone subject to the restrictions denoted on the voucher.

**Training voucher experiment in the Netherlands**
The voucher experiment analyzed here, was conducted by CINOP Centre of Expertise and was initiated and partially funded by the Ministry of Education of The Netherlands. The following four sectors: (1) Animal husbandry and greenhouse horticulture; (2) potatoes, vegetables and fruit; (3) food industry; and (4) natural stone.

Program’s goal – was to increase the employability of targeted low-skilled workers.

Design and implementation – The treatment consisted of giving each individual in the treatment group a voucher of €1000 for a training, €500 came from the government and the other €500 from the sector funds. The funds were in charge of administering the vouchers and they informed the individuals of their treatment status.

**Chile - Training Vouchers and Labor Market Outcomes**
At the beginning of 2011, Chile implemented the BTA to address the low levels of employability of particular groups of workers and increase their access to better quality jobs. The BTA, managed by SENCE, consists of a grant that allows workers to choose labor-training courses from a predefined list. The training takes place at technical training organizations (OTECs, for its acronym in Spanish).

Program’s goal – To increase the employability and increase access to better quality jobs.
Design and implementation - To be eligible for the voucher, applicants had to be employed; be at least 18 years old and no more than 60 for women and 65 for men; have had contributed to social security at least 12 months (continuously or discontinuously) during their professional lives; have had contributed at least 6 months (continuously or discontinuously) during the year prior to the application; and, have, on average, a monthly gross wage lower than US$1,200 (CLP 600,000). By design, the training courses lasted between 80 and 140 hours (distributed, on average, over a 6-month period).

**Australia - Victorian Training Guarantee (VTG)**

The establishment of the broad-based voucher scheme known as the Victorian Training Guarantee (VTG) in the Australian state of Victoria was part of national reforms in 2008. All Australian states agreed to introduce demand-driven models where funding follows student choice. Victoria was the first state to implement such reforms from July 1 2009 for 15-19 year-olds by introducing the VTG. The VTG did not affect public funding of the classroom component of apprenticeships and traineeships. Depending on the circumstances of the student, extra subsidies are also available to colleges to meet the extra cost of catering for ‘high needs learners’, such as Indigenous students.

Program’s goal – To increase the employability of 15-19 year-olds.

**Switzerland - Large-scale randomized field experiment with vouchers for adult training**

The field experiment was conducted in Switzerland in the 2006-2007 period. The experiment used the Swiss Labor Force Survey (SLFS) data. It selected a random sample of 2,437 individuals for the experiment from the approximately 6,000 individuals who would otherwise have been scheduled to continue participating in the next round of interviews. The experimental group was matched with a control group of about 14,000 individuals who were interviewed by the SLFS as scheduled in 2006 and met the criterion of having been interviewed in 2005. Only subjects aged 20 to 60 were entitled to receive vouchers. There were no limitations as to employment status.

Program’s goal – was to increase the employability of voucher users.

Design and implementation - The 2,437 randomly selected individuals received a letter from the Swiss Federal Statistical Office during the first days of January 200612 containing the adult education voucher. The letter stated that the voucher was in reward for past participation in the SLFS. Recipients were entitled to use the voucher for an adult education module of their choice.

**Argentina’s Proempleo Experiment**

Argentina’s Proempleo Experiment was conducted in 1998–2000 - In the experiment, one randomly chosen sample of Trabajar workers received a voucher that entitled a private-sector employer to a wage subsidy covering part of the total wages paid to the employee. A second sample was offered limited training as well. A third random sample formed the control group. After a baseline survey, follow-up surveys were conducted at six month intervals for a total of 18 months.

Target – Increase employability of workfare participants in a welfare-dependent urban area

Design and implementation - Experiment-based.

**The Technical and Vocational Vouchers Program (TVVP) in Kenya**

Approximately 2,160 out-of-school youths (roughly 18 to 30 years old) applied for vocational education tuition vouchers, and a randomly selected half were awarded vouchers. Among voucher winners, a random half (approximately 530 students) were awarded a voucher that could only be utilized in public (government) vocational institutions, while the other half were awarded a voucher that could be used in both private and public schools. Each voucher is worth approximately US$460, an amount sufficient to fully or almost fully cover tuition costs for both government and private vocational programs.
Appendix 2. Description of the methodological design of the selected studies


*Design of the study* – Experimental (vouchers randomly assigned to applicants)
ECAPs selected up to 50% more applicants than the places available for the courses. 30 of the selected applicant were then randomly assigned to the course while the others were used as a control group. The baseline survey collected information on the individuals in the sample before their participation in the program. The follow-up survey collected information on individuals after the end of the classroom and on the-job training. The baseline sample included 2,066 individuals in the treatment group and 2,287 controls. The follow-up interviews were carried out between 13 and 15 months after the conclusion of the program.

Two additional source of administrative data:
1. SISPRO contains information from the Unified Register of Contributions
2. SISBEN index which was constructed as a weighted average of a number of household level variables

*The methodology* followed was based on regression analysis.

ii. Training Vouchers in Germany under the HARTZ reform - Doerr et al. 2014

*Design of the study* – Non-experimental.
Data were provided by the Federal Employment Agency of Germany. These data contained information on all individuals in Germany who received a training voucher in 2003 or 2004 and include precise award and redemption dates. Integrated Employment Biographies (IEB). The data contained detailed daily information on employment subject to social security contributions, receipt of transfer payments during unemployment, job search, and participation in different active labor market programs as well as rich individual information.

The control persons were from the same data base: About 3 percent random sample (based on twelve days of birth during the year) of those individuals in Germany who experience at least one switch from employment to non-employment (of at least one month) between 1999 and 2005.

The final sample included 133,193 unweighted observations, of which 50,796 individuals were awarded with a voucher during their first twelve months of unemployment and 82,397 observations were in the control group. There were 42,331 individuals in the sample who redeemed their vouchers. This amounts to a redemption rate of 83%. Further, 8,465 vouchers were awarded but not redeemed.

*Methodology*
Inverse probability weighting (IPW) and ordinary least squares (OLS). For both approaches, exact matching was performed on the elapsed unemployment duration and the duration since the award of the voucher. The comparison included only individuals who were still unemployed at the time of the treatment start.

Robustness checks included investigating the sensitivity of the OLS results with respect to selection on unobservables using an IV approach. To instrument consisted in the remaining variation after having controlled for a large set of individual and regional characteristics. These controls account for individual and regional differences in labor market conditions, which were likely to affect the outcome variables directly.

iii. Germany, Federal State of North Rhine-Westphalia; Bildungsscheck program – Görlitz, 2010
Design of the study – Establishment Panel that was conducted annually by the Institute for Employment Research (IAB) in Nuremburg. It was representative of all German establishments having at least one employee in receipt of social security which were approximately 80% of the German workforce. A variable for training incidence was generated indicating whether establishments financed employee training either by covering direct costs of training or by providing training during working hours. All in all, the sample consists of more than 8100 establishment.

Methodology - A difference-in-difference approach. DD estimator compueres the training development of establishments in NRW across time with the development of other German federal states. The second DD estimator (henceforth referred to as DD2) compueres the training development before and after the introduction of the reform between small and large establishments

iv. Germany, Federal State of North Rhine-Westphalia; Bildungsscheck program – Görlitz et al 2015

Design of the study – The analysis focused on individuals who participated in the program in 2010. The first wave of interviews took place with around 5,050 individuals in 2010. The second wave of interviews took place 12 months (± 2 months) after the first interview. The intended number of realized interviews was reduced to 2,210 in the second interview. In the first interview, information was collected on the redemption of the voucher, sociodemographic characteristics, the employment history of the previous two years as well as the current employment status and (if employed) the characteristics of the current job.

The control group included individuals who obtained a voucher, but did not manage to redeem it until the time of the second interview because of a random event. These events include: a cancelation of the training course by the provider, a change of timing or location of the course by the provider, an illness, a family-related reason or not having enough time.

Methodology - OLS and equations using linear fixed effects models

v. Training voucher experiment in the Netherlands Hidalgo et al. (2014)

Design of the study – The data from a randomized experiment that was conducted in four sectors with a majority of low-skilled workers.

Methodology - OLS regressions

vi. Training Vouchers in Germany under the HARTZ reform Huber et al. (2015)

Design of the study – Data were provided by the Federal Employment Agency of Germany. These data contain information on all individuals in Germany who received a training voucher in 2003 or 2004 and include precise award and redemption dates. Integrated Employment Biographies (IEB). The data includes information allowing to control for wealth of personal characteristics and detailed labour market histories (e.g., type of employment, industry, occupational status, earnings) see Lechner and Wunsch (2013).

Control - Unemployed individuals without voucher award (and redemption) during the years 2003 and 2004. It also originates from the IEB and was constructed as a three per cent random sample of individuals who experience at least one transition from employment to non-employment (of at least one month) in 2003. The follow-up period was four years.

vii. Training Vouchers and Labor Market Outcomes in Chile - Kaplan et al. (2015)

Design of the study A administrative data from SENCE containing information on BTA applicants. The study also uses data from the Chilean UI system, which was administered by the Unemployment Fund Administrator, and contains data from all formal dependent workers since 2002. For every voucher received, it was possible to identify the starting and ending dates of the corresponding training course.
The final sample consisted in a limited the sample to the 137,657 individuals who met the eligibility criteria and were at least 18 years old in 2006. Out of these observations, 30 percent (29,917 workers) enrolled in a training course in 2011 (treatment group). The remaining 70 percent (70,038 workers) were awarded a voucher but did not enroll in a training course (control group).

**Methodology** - OLS regressions

**viii. Broad-based voucher in VET in Australia- McVicar et al. (2015)**

*Design of the study* – The main dataset used in the analysis was the VET Provider Collection (VETPC), an annual administrative dataset containing records of the population of publicly-funded VET students in Australia. The sample of analysis was all new enrolments among 15-19 year-olds (on January 1st in the year of enrollment, which determines VTG eligibility) who were no longer in secondary school and who commenced study in 2008 (prereform) or 2010 to 2011 (post-reform). The VETPC contains detailed course, student and college information, and a unique student.

*Methodology* - Difference-in-differences approach (Victoria relative to NSW)

The study uses differences in the timing of national reform implementation between Victoria and NSW, which occurred for exogenous political reasons. Therefore the Victorian reforms were treated as a natural experiment and their impact was estimated using a standard difference-in-differences approach.

**ix. Large-Scale Randomized Field Experiment with Vouchers for Adult Training- Messer et al. (2009)**

*Design of the study* – (add it here)

*Follow-up period* – 1 year

*Methodology* - Probit and multinomial logit regressions

**x. Voucher Funding of Training Programs: Germany’s Hartz reforpm Poeschel (2013)**

*Design of the study* – All data was supplied by the public Federal Employment Service (Bundesagentur für Arbeit) in Germany including: voucher use, integrated employment histories (data called IEB), civil status, number of children, and health status. Sample selection: those who were unemployed at some point in 2004. For the treatment, those unemployed who receive a voucher make up the treatment group, all others being the control group. The outcome variable was binary and indicates whether or not a client was in employment after one year has elapsed.

*Follow-up period* – One year

*Methodology* - The nonparametric estimator was also analysed in Frölisch (2007), where it was found to be SQTn-consistent and efficient. Its implementation for a binary instrument was available from Frölisch and Blaise Melly.

**xi. Voucher Funding of Training Programs: Germany’s Hartz refoopm Rinne (2013)**

*Design of the study* – All data was supplied by the public Federal Employment Service (Bundesagentur für Arbeit) in Germany (see above) In order to isolate the institutional effect, a two-step propensity score matching procedure was applied. In the first step, the pre-reform participants were matched with the post-reform participants.

In the second step, the matched pre-reform participants in 2002 were matched with non-participants of the same year.
The corresponding treatment effect ATT2002|2003 was the effect only for those participants under
the pre-reform regime who were comparable to participants after the reform

Follow-up period – 1.5 years

**Methodology** - Two step matching (see above)

**xii. The impact of an adult education voucher program: Evidence from a randomized field experiment Schwerdt et al. (2013)**

*Design of the study* – The study included a random sample of 2437 individuals for the experiment who had been interviewed in the 2005 SLFS and would normally have been scheduled to continue participating in the next round of interviews but would have been dropped for financial reasons. The treatment group was matched by a control group of 17,234 individuals who had been interviewed by the SLFS in 2005 and were scheduled to be interviewed again in 2006.

Follow-up period – 1 year

**Methodology** - Probit and multinomial logit regressions

**xiii. Assisting the transition from workfwere to work Galasso et al. (2004)**

*Design of the study* – Experiment (add it here)

Follow-up period – 1.5 years

**Methodology** - Differences in means, Double Difference Estimates of Impact.