

Do Apprenticeships Provide Skills Beyond the Master's Trade?

Evidence on Apprenticeships, Skills and the Transition to Work in Senegal

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EXTENDED ABSTRACT

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A large body of literature suggests that general skills are rewarded in labor markets with higher education leading to better jobs and higher earnings (Bigsten et al., 2000; Glick and Sahn, 1997). Consistent with an inefficient educational system, a growing body of literature suggests that returns to education increase with the level of education in developing economies (Duraismy, 2002; Söderbom et al., 2006; Kahyarara and Teal, 2008). A convex earnings function, which implies lowest returns for individuals with least education, gives incentives for the adolescents with no or low education to look for alternative ways to acquire skills that are valued on the labor market. The evidence in developing economies suggests positive returns to vocational training on earnings (Moenjak and Worswick, 2003; Kahyarara and Teal, 2008). In Senegal, this pathway remains underdeveloped because secondary schools dedicated to vocational training are few and because the kind of training is only accessible to adolescents who have completed the first three grades of middle school (Walther and Filipiak, 2007). As a consequence, informal on-the-job training, such as apprenticeships, remains the only option for less-educated adolescents on their way to work.

In Senegal, where a significant share of the youth lack of basic skill in numeracy and literacy (about 9% of the cohort born from 1985 to 1989 never enrolled in school and less than 55% of the cohort reached middle school), apprenticeships are a popular source of skills for the youth and one of the main provider of skilled workers in the informal sector (Chort et al., 2014; Haan and Serriere, 2002). Traditional apprenticeship training is based on the transmission of a technical knowledge from a master craftsman to an apprentice and takes place in small-scale firms of the handicraft industry. The more common type of trade includes mechanics, woodworking, welding, bricklaying, plumbing, electrician and sewing for men, sewing and haircutting for women. The trade is learned on-the-job, in a workshop or a building site. Skills developed through apprenticeships are driven by the local demand as the training depend exclusively on the firm activity. The training process is entirely informal: it does not include in-class training, does not rely on a common curriculum and do not deliver certificates. As a

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consequence, apprenticeships are usually very long (five years on average) and differ widely in terms of quality.

Traditional apprenticeship training is seen as a second chance for adolescents who dropped out of formal school early. Its informal nature and heterogeneous quality raise questions about the returns to apprenticeships. While most African countries are working on modernizing technical and vocational training, can an informal technical training, such as apprenticeships, be a pathway to better employment for low-educated youth?

Although traditional apprenticeships are widespread in West Africa (Adams et al., 2013; Filmer and Fox, 2014; Walther, 2008) and especially in Senegal (Chort et al., 2014), the lack of detailed data on apprenticeship has prevented researchers from drawing causal inference on the role of apprenticeship on labor market outcomes in developing countries, and little is known about what leads adolescents to engage into apprenticeship (Teal, 2016). The few rigorous studies suggest that traditional apprenticeship allows young people without education to better integrate the labor market and achieve greater earning. In the context of Ghana, Monk et al. (2008) shows that while former apprentices earn significantly less than the rest of the working population, there are positive returns to apprenticeship training for individuals with no or low formal education. G. Frazer (2006) also observes positive returns to apprenticeship but emphasizes that the technical skills one learns in a workshop is sector-specific, as oppose to the general knowledge acquired through formal schooling, limiting employment options outside the master's firm. He argues that self-employment is therefore the only way to obtain returns to apprenticeship training and points out the credit constraint as the main obstacle for the youth to take advantage of their newly acquired skills.

Acknowledging the quality of this type of training, apprenticeship schemes have been used in placement programs for unemployed young people in some countries. Those approaches question about the capacity of the handicraft sector to absorb a surge in the number of apprentices. Results from recent studies, set in Ghana and Cote d'Ivoire, highlight the presence of an unmet demand for apprentices in the handicraft sector as the placement of young workers increases the treated firm size (Crépon and Premand, 2018; Hardy and McCasland, 2015). According to Hardy and McCasland (2015), the unmet demand reflects the high cost associated with the search for high-ability apprentices. Interestingly, both studies observed that placed apprentices contribute to an increase in firms' profit.

The purpose of this paper is to fill the gap in this literature by investigating the role of the traditional apprenticeship training in the transition to adulthood in Senegal. More specifically, after modeling the determinants to participation to apprenticeships, we explore the returns to apprenticeships in the labor market and investigate whether the training contribute to the accumulation of cognitive and non-cognitive skills.

This paper is part of a larger project investigating the transition to adulthood in Senegal on the basis of a long-term individual panel dataset. The whole sample consists of a cohort of 1953 persons born between 1985 and 1989 who have been interviewed twice, first as adolescents in 2003 (*Enquête sur l'Education et le Bien-être des Ménages au Sénégal*) and during a follow-up as young adults in over the 2011-13 period (*Enquête sur les Transitions des Jeunes au Senegal*). Cohort members, who were aged 14 to 17 of age at baseline, were 22 to 27 years old at endline, making our sample particularly relevant for studying the school to work transition of young adults.

This data is especially well suited for analyzing the transition to work of the less educated youth. First, the panel encompasses the period of the life-course when young people make decisions regarding investments in education and the school-to-work transition. It also encompasses the age at which most adolescents engage into apprenticeships (around 14 to 16 years old). Second, both surveys put a special emphasis on the school to work transition and included detailed information on educational achievement and labor market outcomes. Specifically, it includes questions about the duration of the apprenticeship

training and the kind of trade the apprentice learned. Thirdly, while the level of technical skills acquired by apprentices was not assessed, cohort members were given cognitive tests to assess their knowledge in mathematics, French and life skills, as well as “Big Five” personality traits (conscientiousness, extraversion, neuroticism, agreeableness and openness to experience).

When investigating the returns to apprenticeship, the main threat to identification is the endogeneity of the participation in apprenticeships with respect to both work outcomes and skills accumulation: participation is likely driven, in part, by unobserved dimensions of ability and a parent’s capacity to find a master willing to accept a new apprentice. Therefore, adolescents who select into apprenticeships are likely to have higher “apprenticeship abilities”, different abilities in formal education and different preferences with respect to occupations. Moreover, the decisions to leave school and to undertake apprenticeship training may occur simultaneously, raising concerns about reverse causality in the production of skills.

To overcome the potential for endogeneity bias, our strategy of identification relies on exploiting proxies for the local demand for apprentices as an instrument for the participation in apprenticeships. Adapting a standard methodology proposed by Bartik (1991) and widely used in the labor economics literature since, the proxies for the demand for apprentices are constructed by first using the 2002 census of the Senegalese population to calculate the local employment shares for young workers (15-34 years of age) in each industry that may employ an apprentice. Next, WITS data are used to calculate the growth in imports of the key inputs used in sectors that employ apprentices (e.g., imports of woods for woodworking, metals for metal workers, fabric for tailoring). The Bartik shift-share instruments is then computed by first interacting the initial share of employment in each crafts-related sector within a community (based on share of employment of young workers) with the average annual growth of the most important imported input used in the industry sector through 2012, and then we sum across sectors within the community to obtain a proxy for community specific increase in demand for apprentices across all sectors. With the aim of maximizing the power of the instrument, we interact the proxy for demand with an indicator of whether an individual is from the primary local ethnic group, reflecting the fact that ability to respond to local demand may be influenced by a parent’s local network. Both instruments (the shift-share index and its interaction with ethnicity) have a strong positive effect on the participation in apprenticeships.

Additionally, we rely on the value-added methodology to investigate the impact of apprenticeships on the accumulation of skills. As innate ability and preferences toward education are likely to influence educational choices and performance at school, estimating the contribution of apprenticeship training to the accumulation of cognitive and non-cognitive skills at adolescence is also threatened by the presence of unobservables. The panel dimension of the measure of cognitive skills allows for the estimation of a value-added model where a measure of prior achievement is included in the production function with the aim of controlling for unobservable inputs that have affected the production of skills before baseline.

We provide evidence that, while selection into apprenticeship is mostly driven by the lack of formal schooling and serious delays in educational progression by teenage years, apprenticeship experience is associated with positive returns on the labor market. Conditional on educational attainment lower-ability adolescents are more likely to undertake apprenticeship. Family background and network also plays a role in the decision: the presence of a former or current apprentice in the household at adolescence increases the likelihood of becoming an apprentice.

Despite the lack of general skills, apprenticeship experience is rewarded in the labor market. There is no significant effect of apprenticeship training on the participation to the labor market but former apprentices have worked more weeks than non-apprentices over the last 12 months. Moreover, former apprentices are more likely to work outside of agriculture, especially the young men in the lower end of

the skills distribution as the marginal effect of apprenticeship on the probability to work outside of agriculture decreases with skills. We do not observe any clear effect on earnings.

These positive returns cannot be attributed to the contribution of apprenticeship on the acquisition of general knowledge. Estimates of the value-added model suggests that apprenticeship experience does not contribute to the development of numeracy or literacy skills. Conditional on additional schooling and the initial endowment, apprenticeship experience has no significant effect on the acquisition of cognitive skills during teenage years with the notable exception of a positive impact on emotional stability (neuroticism).

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