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# Learning the master's trade: Apprenticeship and human capital in Ghana

Garth Frazer *

*Centre for Industrial Relations, University of Toronto, 121 St. George Street, Toronto, ON, Canada M5S 2E8*
*School of Management, University of Toronto, 105 St. George Street, Toronto, ON, Canada M5S 3E6*

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**Abstract**

This paper explores the institution of apprenticeship in Ghana. A model is presented where apprenticeship training is idiosyncratic, increasing an individual's productivity in the current firm, but not in any other firm. Still, individuals are willing to fund apprenticeships as they can reap the returns to the specific training of apprenticeship if they manage to acquire the capital required to start their own firms, and replicate the technology and business practice of the apprenticeship firm. Predictions of the model for the productivity and remuneration of different workers are developed and tested using both a linked employer–employee survey of manufacturing firms and a national household survey.


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## 1. Introduction

The formulation of an appropriate education and training policy for the manufacturing sector in Africa should begin with an understanding of the training currently in place. Given the importance of apprenticeships in Africa,[1] where apprentices learn one of the trades used in the manufacturing sector, any analysis should begin by examining this institution. Nevertheless, very few articles exist which use economic analysis to explore apprenticeships in Africa (Velenchik,

* Tel.: +1 416 978 5692; fax: +1 416 978 5433.
*E-mail address:* gfrazer@chass.utoronto.ca.

[1] Apprenticeships are particularly important in West Africa, but are significant institutions throughout Africa. Their significance is documented in Boehm (1997) and Bas (1989).


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1995). This paper is a step towards addressing this dearth and contends that the apprenticeship institution is best understood in the larger context of the specificity of firm training.

Apprenticeships are periods of roughly 3 years in length during which an apprentice learns a trade, such as metal-working or carpentry from a master of that trade. At the end of the apprenticeship, the apprentice may end up being hired by the firm where the apprenticeship occurred, begin working at another firm or the apprentice may start a new firm and become self-employed. Apprenticeships occur most often, but not exclusively, in smaller firms, and the master is often the owner of the firm.

Becker (1964) showed that, in the human capital model with perfect labor markets, workers (and not firms) always pay for general training, which increases an individual's productivity with all employers, as the value of their outside wage offer increases with general training. However, firms cannot credibly commit, without some formal contracting or other mechanism, to compensate workers for firm-specific training once it has occurred, as it does not increase their outside wage offers. This dichotomy has provided a framework for analyzing the nature of training in a number of studies. Acemoglu and Pischke (1998) treat German apprenticeships as general training and present a model that explains why firms are willing to invest in this training. Acemoglu (1997) and Acemoglu and Pischke (1999) provide distinct models, which explain why firms might invest in general training.

Other papers have examined worker investment in firm-specific training. Prendergast (1993) describes the potential for promotion rules to induce worker investments in firm-specific human capital, with the firm's ability to commit to future wage increases through long-term contracts playing a significant role in the model's mechanism. Scoones and Bernhardt (1998) remove the need for long-term contracts to achieve worker investment in firm-specific human capital by introducing asymmetric information. In their model, workers invest in firm-specific human capital, in order to be promoted by the firm, as promotion reveals their higher ability to other firms. In a similar model, Scoones (2000) finds that workers invest in firm-specific capital because efficient turnover transforms former employers into outside options. Other papers (e.g. Felli and Harris, 1996) examine firm-specific human capital as something exogenous to worker decisions, but we are interested in examining investment in human capital that is discretionary from the worker perspective.

At first glance, apprenticeships might appear to be general training, that is applicable at least in all of the firms within an industry, if not more generally. As noted, this is how they have been understood in Germany. However, the nature of the training acquired in Ghana is far more specific—specific to the firm providing the training, reflecting the firm's technology and business practice. In this context, the model of apprenticeship to be developed shares the spirit of the model of Jovanovic and Nyarko (1995). In their overlapping generations model, each old agent understands an idiosyncratic (which is unique to the firm owned by the old agent) technology, which is passed on to a young agent who is his apprentice. This interpretation of apprenticeships as training unique to the firm is consistent with the apprenticeships under examination in this paper.[2] Apprentices are taught by a master how to work the master's craft, but the way in which that craft is carried out varies highly from firm to firm. In the process of this research investigation, I visited and interviewed dozens of the manufacturing firms in the dataset. A number of the firms interviewed were involved in the manufacture of a single item. When

[2] The apprenticeships under examination in this paper include all of the non-tailoring apprenticeships in Ghana, in particular those within the Ghanaian manufacturing sector. Tailoring apprenticeships are to be considered in a separate paper by the same author in order to account for their idiosyncratic nature.