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# Credit constraints and investment in human capital: Training evidence from transition economies



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## ABSTRACT

Using a unique survey database of 8265 firms from 25 transition economies, I find that lack of access to finance in general, and to bank credit in particular, is associated with significantly lower investment in on-the-job training. This effect is stronger in education-intensive industries and in industries facing good global growth opportunities. To address endogeneity issues, I use the structure of local credit markets as an instrument for credit constraints at the firm-level. In addition, in panel estimates, I control for the presence of unobserved firm-level heterogeneity, as well as for changes in macroeconomic conditions.

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## 1. Introduction

It is widely recognized that capital market imperfections can have adverse consequences for firm growth. A large empirical literature has documented the negative effect of credit constraints on capital investment (Love, 2003), R&D investment (Brown et al., 2009), and advertising expenses (Fee et al., 2009), among others. One potentially important alternative channel is investment in human capital through on-the-job training. Firm investment in human capital is costly<sup>1</sup> and at the same time intangible, thus harder to finance than physical assets. Becker (1962) was the first to argue that lack of access to external financing may depress efficient investment in training, either because credit constrained workers will not be willing to accept lower wages, or because credit constrained firms may not be able

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<sup>1</sup> Total annual spending on on-the-job training in the US economy routinely amounts to 2% of GDP, about one third of total expenses on formal education (for early evidence, see Mincer, 1962).

to pay workers more than their marginal product during the training period. However, because direct measures of credit constraints are missing in conventional datasets, there is no microevidence that credit constraints affect training or that the magnitude of the effect is economically important.

In this paper, I attempt to uncover the missing link. I use data from the 2005 EBRD/World Bank “Business Environment and Enterprise Performance Survey” (BEEPS) on 8265 small and medium enterprises from 25 transition economies to analyze the impact of various self-reported financing constraints on on-the-job training. The survey contains detailed firm-level information on training, on different proxies for credit access, and on various firm-level characteristics which enables me to control for a variety of standard predictions of human capital theory.

Under what conditions should firm-level credit constraints matter for on-the-job training? The theoretical literature provides answers to this question along two dimensions, related to the nature of training and to the structure of labor markets. In traditional human capital theory, firms do not pay for general training whose cost is fully borne by the workers, and so firm-level credit constraints should matter only in the case of specific training (Becker, 1962). More recently, the literature has suggested that firms are willing to pay for general training too, for example because they obtain superior information on the worker’s ability during training (Acemoglu and Pischke, 1998), or because the firm’s monopsonic power results in a compressed wage structure (Acemoglu and Pischke, 1999b). In these models, credit constraints on the side of the firm matter as long as the firm enjoys a certain degree of oligopsonic wage setting power, and as long as contractual problems do not prevent the firm from committing to providing training once the worker has made a wage concession.

There are three main stumbling blocks in evaluating the impact of credit market imperfections on investment in human capital. The first one is that while the literature has studied extensively what constitutes a credit constrained firm,<sup>2</sup> credit constrained firms are usually not observable. Indirect tests based on the response of wages to training in current and future jobs (e.g., Booth and Bryan, 2005) are unable to reveal the magnitude of the negative effect of credit constraints on training. In contrast to such studies, and similar to Jappelli (1990) and Cox and Jappelli (1993), I identify firms that do not have access to credit markets from replies to direct questions about whether firms were denied credit or did not apply fearing that they would be denied.

Second, credit constrained firms may also be firms for which the return to training is lower due to their more general technology, to their inability to lock workers into long-term contracts, or to their low degree of oligopsonic power. The detailed firm-level dataset used in this paper allows for separating the effect of credit constraints from the effect of these alternative factors. In particular, I observe how long it takes the firm to fill a vacancy (a proxy for oligopsonic power), the extent to which the firm is subject to labor and social security inspections (a proxy for the degree of contractual problems between the firm and its workforce), and the frequency with which the firm updates its technology (a proxy for the mix of general vs. specific training).

The most important stumbling block is that the use of survey-level data raises standard concerns about endogeneity. For one, there is the problem of reversed causality: less efficient (low-growth) firms may be reporting higher financing constraints as they shift the blame for their underinvestment to the country’s credit markets. For two, the cross-sectional nature of the data raises questions about omitted variable bias: for example, unobserved growth opportunities or managerial ability could be the main driving force behind the scale of the firm’s on-the-job training program. If less efficient firms over-state their credit constraints, or if firms with more able managers and with better growth opportunities are also less constrained, then a negative association between credit constraints and on-the-job training will be capturing a simple correlation between the two, rather than a causal link from constraints to training.

I address these issues in three ways. First, I employ a difference-in-differences specification whereby I exploit the fact that firms in certain industries are more likely to benefit - in terms of on-the-job training - from relaxed credit constraints. Second, I employ an instrumental variable procedure based on exploiting local variation in credit provision. In particular, I use the structure of local (city-level)

<sup>2</sup> See, for example, Fazzari et al. (1988), Kaplan and Zingales (1997), Whited and Wu (2006), Rauh (2006), Hadlock and Pierce (2010), among others.

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