Learning Through the Lens of Your Job:

The Effect of Employer-Financed MBA Education on Turnover

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PRELIMINARY AND INCOMPLETE

Abstract:

Employer-financed education is a widespread practice in which tuition costs of coursework taken by employees is reimbursement by the employer. This practice of investing in general human capital by firms represents a puzzle because recouping the returns on such investments requires reduced turnover following investment, which is not predicted by human capital theory because general skills are transferable across employers. This paper examines two mechanisms by which employer-financed educational assistance may affect turnover using data on students who pursue a Master's in Business Administration (MBA) while working. This paper tests two potential mechanisms outlined in the training literature for how employers may recoup investments in general skills training: 1) mobility constraints, and 2) complementarities between firm-specific human capital and general human capital. I find evidence supporting both mechanisms, but find that complementarities between the skills sets has the stronger relative effect on turnover intentions. Future work will consider how the results vary by whether the coursework is required versus elected by the student and sensitivities to the measure of complementarities.

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I. Introduction

A key area of personnel economics focuses on the provision of human resource practices by firms, such as why one type of compensation is offered over another (Lazear and Oyer 2007). While this area of research includes various types of wage compensation, it also includes types of non-wage compensation, which have been shown to have sizable effects on worker behavior, such as mobility in the case of health insurance and traditional pension plans.

The present analysis examines the effect of employer-sponsored investment in general human capital, administered through tuition reimbursement programs, on employee turnover. Employer-provided tuition reimbursement is a widespread program in which firms provide financial assistance for the direct cost of coursework taken by its employees. Estimates of the percentage of firms that offer this program range from 47 percent (Black and Lynch 1998) to 85 percent (Cappelli 2004). These programs support investment in an employee's general human capital – skills that are transferable across employers – because accredited academic institutions are responsible for curriculum development, instruction, and certification and serve students employed at hundreds of different establishments.

These programs represent a puzzle because firms are unlikely to make general human capital investments without some expectation of receiving an ex post return, but standard human capital theory predicts that recouping investments in general skills would result in increased employee turnover (Becker 1962). According to standard theory, these workers will be hired away by other employers because the skills acquired are transferable across firms by definition. This puzzle has spurred empirical evaluation of the effect of tuition reimbursement programs on employee turnover. Recent studies find evidence of a negative relationship between tuition

reimbursement and employee turnover rates (Cappelli 2004; Manchester 2008). However, the mechanism by which turnover is reduced has not yet been determined.

This paper considers two possible mechanisms. First, productivity at the current firm relative to other employers could be enhanced if the general human capital acquired through coursework increases the productivity of firm-specific skills through complementarities in production. The theoretical work of Acemoglu and Pischke (1999) supports this channel as a possible mechanism, but empirical tests of this hypothesis are lacking. Second, employees could be explicitly bound to the firm through formal restrictions on service length following reimbursement. If violated, the employee must repay all or part of the tuition cost. However, because outside firms could include such repayments in employment offers, it is not clear how binding these constraints are. In the framework of Acemoglu and Pischke (1999), these requirements represent explicit mobility costs. This paper tests whether there is empirical support for these two mechanisms and, if so, their relative strength in explaining reductions in turnover.

II. Model

This paper uses the following model of how coursework and tenure at the firm affect the stock of firm-specific human capital (F) relative to general human capital (G). The ratio of these skill sets, λ, positively affects the employee's productivity at the current firm relative to outside employers. We model λ as a function of tenure at the employer (τ) and coursework (c), given by:

$$\lambda = f(F, G) = h(\tau, \theta, c) \qquad (1)$$

where $h_1 > 0$, $h_2 > 0$, and $h_3 < 0$. The parameter θ is the degree to which coursework indirectly increases firm-specific human capital via complementarities. Ceteris paribus, a decrease in λ will

increase the probability of voluntary turnover, which captures the risk of employees being poached by outside firms due to an increase in general skills relative to firm-specific skills.

I estimate the effect of the two mechanisms on employee turnover by approximating equation 1 with a linear function:

$$T_i^* = \alpha c_i + \beta_1 \theta_{i+} \beta_2 \theta_i c_i + \beta_3 M_i + \mathrm{X_i}\boldsymbol{\delta} + \varepsilon_i \qquad (2)$$

where T_i^* is the employee's turnover propensity, M_i represents mobility costs imposed by service requirements following reimbursement, and $\mathbf{X_i}$ includes controls for tenure at the firm as well as other employee and firm characteristics. The measure θ_i enters equation 2 as a main effect (i.e. the degree of complementarities reduces turnover intention by increasing firm-specific skills) and as an interaction (i.e. the relationship between investment in general human capital and turnover intention is attenuated due to complementarities). Estimating the regression parameters allows for an empirical assessment of the relative influence of the two mechanisms.

III. Data

The data used in this analysis come from a longitudinal dataset of students pursuing a Masters in Business Administration (MBA) at the University of Minnesota. Recent work by Arcidiacono, Cooley, and Hussey (2008) examines the return to MBA degrees using the GMAT Registrant Survey. This survey only includes an indicator for whether the majority of the degree was financed by the employer and thus is not well-suited to examine how program characteristics relate to turnover.[1] In estimating the returns to an MBA degree, Arcidiacono et al. find that

[1] Arcidiacono et al. (2008) find that approximately 60 percent of part-time students had the majority of their MBA tuition was paid for by their employer.

students who had the majority of their tuition financed by their employer did not have significantly different returns to the MBA degree.

For the present study, the dataset was constructed by collecting information on employment status (including earnings, position change, and employer change) and information on coursework completed for up to five contiguous semesters. (Data collection is ongoing). The initial data collection included a sample of students who were enrolled in the MBA program in January 2008, who had completed coursework ranging from 0 to 29 credits out of a 48-credit program. Students who began their MBA coursework in subsequent semesters have also been enrolled in the study. The present analysis restricts the sample to students who are pursuing their degree while working (239 individuals with 623 post-semester observations). Using the post-semester survey as the unit of analysis, average credits taken per semester are 4.6 with a standard deviation of 3.0 and average accumulated credits are 16.7 with a standard deviation of 10.5. Using demographic information available from the MBA program office, such as percent female, work experience, and GMAT scores, the sample appears to be representative of the population of students.

The data are appropriate for examining the mechanism by which tuition reimbursement affects turnover because 87 percent of the sample participates in a tuition reimbursement program. Programs vary widely in their characteristics. In terms of reimbursement amounts, 32 percent of programs do not limit the annual reimbursement, while 12 percent reimburse less than $5,000, 34 percent reimburse between $5,000 and $5,999, and 20 percent have an annual reimbursement cap of $6,000 or greater.[2] Programs also vary in the requirements they impose

[2] The modal amount between $5,000 and $5,999 can be explained by the tax structure of these payments: reimbursements less than or equal to $5,250 are not subject to personal income tax (Section 127).

following receipt of tuition reimbursement. Fifty-five percent of programs do not require continued employment following reimbursement, while 20 percent require 12 months and 22 percent require more than 12 months of continued employment following reimbursement.

The measure of turnover used in this paper is an employee's response to the following question: "What is the chance that you will voluntarily quit your job in the next 12 months?"[3] This question is on each post-semester survey. The average probability is 0.27 with a standard deviation of 0.30. Industrial relations and human resources scholars use measures of turnover intention and have validated its positive relationship with actual turnover (e.g., Griffeth, Hom, and Gaertner 2000). To validate this measure in this dataset, I examined the relationship between turnover intention and subsequent turnover and found that lagged turnover intention has a large, positive and significant predictor of actual turnover. Future work will incorporate actual turnover as more waves of data become available.

IV. Analysis

The empirical analysis consists of estimating equation 2 on the sample of employed MBA students using the post-semester data as the unit of analysis. An advantage of restricting the analysis to employed individuals who are all pursuing the same degree is that I am able to side-step other potential mechanisms hypothesized in the literature as to how general human capital may reduce turnover. In particular, it has been hypothesized that the reduction in turnover stems from the current employer having an informational advantage over outside employers in terms of the type of general human capital acquired or over the ability of the employee. However, these mechanisms are not relevant in this context because they equally affect all individuals in the

[3] Responses include: 100% chance, 75% chance, 50% chance, 25% chance, and 0% chance.

sample. Hence, this paper provides a test of complementarities and explicit mobility costs in isolation from issues of stemming from asymmetric information.

Equation 2 provides the basis for the empirical strategy. Coursework (c_i) is the number of total credits the student has accumulated as of the post-semester survey. I proxy for θ_i in equation 2 using a measure of the extent to which coursework increased the individual's productivity at his or her current employer relative to other potential employers using the following question: "After completing this course, I am more productive at my current employer than if I switched to a different employer," on a 1 (strongly disagree) to 5 (strongly agree) Likert scale. Currently, this measure is the average response for courses taken that semester (mean of 3.02, with standard deviation of 0.90).

Therefore, testing whether complementarities between firm-specific and general skills is a mechanism by which tuition reimbursement reduces turnover intention amounts to a test of whether $\beta_1 < 0$ and $\beta_2 < 0$. I capture mobility costs M_i using k different levels of service requirements following reimbursement where k ={no formal program, no service requirement (excluded category) less than 12 months, equal to 12 months, more than 12 months}. In order to estimate the effect of coursework, complementarities, and program characteristics on turnover intention, I use OLS estimation with robust standard errors clustered at the employee-level. Because I am interested n including the role of post-reimbursement service requirements, including an employee-level fixed effect is not feasible.[4]

Table 1 reports the results of the empirical analysis. I first present the results from a baseline model that just includes the accumulation of coursework to demonstrate that investment

[4]Fixed effects estimation is not used to avoid estimating the coefficients on program characteristics off of the limited number of individuals who switched employers. This will be considered in future work.

in general human capital increases turnover intention: a one standard deviation increase in the number of credits increases the chance of voluntary turnover in the next year by approximately 6.9 percentage points (off a base of 0.27 percent) (column 1). Column 2 adds the measure of complementarities ("Proxy for θ") and its interaction with coursework to test the complementarities mechanism. The results provide strong support for this mechanism (joint test of $\beta_1 = 0$ and $\beta_2 = 0$ has a p-value = 0.000). Employees who agreed that coursework increased their productivity at their current employer relative to other employers had an 11.7 percentage point lower turnover intention. In addition, the relationship between investment in general human capital and turnover intention is significantly lower for these employees: a one standard deviation increase in the number of credits increases the chance of voluntary turnover in the next year by approximately 3.2 percentage points (i.e. 0.0685 - 0.0366 = 0.0319).

When service requirements are included (column 3), I find that only continued employment requirements of over 12 months following reimbursement significantly reduce turnover intention relative to having no service requirement. This requirement reduces turnover intention by 9.9 percentage points. Adding program characteristics does not significantly change the role of complementarities. Therefore, these results show that both mechanisms operate.

Before summarizing the relative influence of the two mechanisms, it is important to note that this paper's findings are consistent with the basic prediction of human capital theory: increasing general human capital has a strong positive effect on turnover intention. In particular, 10 credits of coursework increase the chance of voluntarily leaving the employer by 5 percentage points (off a base of 27 percent) (column 3). In terms of the relative strength of the two mechanisms, the results indicate that complementarities have the dominant effect relative to explicit mobility costs in reducing turnover intention through tuition reimbursement programs. For employees

whose coursework led to increased firm-specific skills, average turnover intention is 10.3 percentage points lower and the relationship between general human capital investment and turnover intention is significantly weaker: 10 credits of coursework increase the chance of voluntarily leaving the employer by approximately 2 percentage points for employees whose coursework led to increased firm-specific skills.[5] Explicit mobility constraints have a limited effect on turnover intention in that they only are effective when the post-reimbursement requirement is over 12 months. While such a requirement does have a substantial effect on turnover intention, most tuition reimbursement programs either lack a post-reimbursement service requirement or have a less restrictive requirement. Therefore, these results indicate that complementarities are the main channel by which investment in general human capital through tuition reimbursement decreases turnover intention.

One potential concern for this analysis is whether θ is endogenous. Namely, if students with high turnover intentions select courses that are less relevant to their current position, then there would be a negative correlation between θ and ε in equation 2. One advantage of examining students pursing the same degree is that 30 of the 48 credits are core credits that students do not have discretion over in selecting classes. Future work can proxy for θ only using core courses as well as examine how θ differs for core vs. elective courses.

Another limitation of this analysis is that I assume the increased productivity at the employee's current firm stems from complementarities between firm-specific and general human capital in production. However, other conceptualizations of firm-specific human capital may support these empirical findings. In particular, Lazear (2009) proposes a skill-weights view of

[5] This is measured as one standard deviation above the mean (or a value of 4.0 on the 5-points scale), which corresponds to agreeing that with the statement that "After completing this course, I am more productive at my current employer than if I switched to a different employer"

firm-specific human capital in which all skills are general, but the way in which they are combined at a particular employer is specific. Bishop (1997) proposed a similar idea. Because I use increased productivity at the current employer relative to other employers as the proxy for complementarities, these two conceptualizations cannot be empirically distinguished in this analysis. Future work should consider how to empirical differentiate these two theories. In addition, future work should address endogeneity concerns in the estimation, such as the potential for sorting of workers across firms based on tuition reimbursement program characteristics.

V. Conclusion

In summary, this paper finds that tuition reimbursement programs reduce turnover through at least two channels: complementarities and mobility costs. While I find that mobility costs imposed by program rules play a significant role when these requirements stipulate continued employment longer than 12 months, complementarities between general skills learned through courses and skills specific to the employer is the dominant mechanism for this population of MBA students. In terms of implications, this paper provides support for using of a richer model of human capital when studying firm training behavior, In particular, such a model should allow for complementarities between firm-specific human capital and general human capital, or include a mechanism by which general skills directly affect the relative productivity at the current employer as compared to other employers, such as the skill-weights approach.

Table 1: Effect of Coursework, Complementarities, and Program Constraints on Turnover

	1	2	3
Coursework^{S}	0.0688***	0.0685***	0.0512***
	(0.0177)	(0.01603)	(0.0158)
Proxy of θ ^{S}		-0.1162***	-0.1030***
		(0.0226)	(0.0117)
Coursework x Proxy of θ ^{S}		-0.0366***	-0.0315***
		(0.0115)	(0.0117)
Tenure at firm	0.0108	0.0097	0.0140
	(0.0119)	(0.0112)	(0.0106)
Tenure at firm, squared	-0.0013**	-0.0013**	-0.0014***
	(0.0006)	(0.0005)	(0.0005)
Annual Earnings ($10,000s)	-0.0154*	-0.0133*	-0.0129*
	(0.0086)	(0.0077)	(0.0075)
No Tuition Reimbursement Program			0.0798
			(0.0560)
Service Requirement < 12 months			0.2294***
			(0.0884)
Service Requirement = 12 months			0.0865**
			(0.0408)
Service Requirement > 12 months			-0.0988**
			(0.0390)
Constant	0.1648	0.1607	0.2038
	(0.1361)	(0.1290)	(0.1270)
R-Squared	0.1704	0.2270	.2776
Observations	623	623	623

Notes: OLS regression where dependent variable is chance of voluntarily leaving employer in next 12 months (0, .25, .5, .75, 1.0). Robust standard errors in parentheses clustered at individual level. Included controls: Female, age, firm sector, firm size, and dummy variables for semester x year. Results robust to using an ordered probit model (not shown). Excluded program category in column 3 is a tuition reimbursement program with no service requirement following reimbursement.

^{S} Indicates standardized coefficients: interpret a one-unit change as a one-standard deviation change.

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