The Effect of Employer-Sponsored MBA Education on Retention

Colleen F. Manchester

University of Minnesota, Carlson School of Management

HCRC Seminar Series: December 15, 2009

Tuition Reimbursement Programs

Employers reimburse employees for direct cost of tuition

- Widespread prevalence: Estimates range from 47% to 85% of employers (Black & Lynch 1998; Cappelli 2004)
- Substantial Investment: Upwards of $20 billion annually (Robbins 2008)
- Part-time MBA programs: Over 60% of students have at least half of tuition paid by employer (Arcidiacono et al. 2008)

Tuition Reimbursement Programs

Employers reimburse employees for direct cost of tuition

- Widespread prevalence: Estimates range from 47% to 85% of employers (Black & Lynch 1998; Cappelli 2004)
- Substantial Investment: Upwards of $20 billion annually (Robbins 2008)
- Part-time MBA programs: Over 60% of students have at least half of tuition paid by employer (Arcidiacono et al. 2008)

Typical program characteristics

- Reimbursement tied to successful completion of course
- Majority have annual reimbursement limit
- Some have service length requirements (before and/or after reimbursement)

Human Capital Theory

Tuition programs provide investment in general human capital

- Instruction at Accredited academic institutions

Predictions of Standard Human Capital Theory (Becker 1964)

- Because general skills transferable, employers cannot capture return
- Implication: Firm will not invest in general human capital
- Employees bear full cost (and capture full return) of investment

Human Capital Theory

Tuition programs provide investment in general human capital

- Instruction at Accredited academic institutions

Predictions of Standard Human Capital Theory (Becker 1964)

- Because general skills transferable, employers cannot capture return
- Implication: Firm will not invest in general human capital
- Employees bear full cost (and capture full return) of investment

Evidence that cost of general training not fully passed to employees

- Apprenticeships (e.g., Acemoglu & Pischke 1998)
- MBA (Arcidiacono et al. 2008; Gicheva 2009)

Widespread prevalence of programs implies firms are able to capture returns to general human capital.

New Developments in Human Capital Theory

How could firms capture return to general training?

Possible mechanisms proposed by literature

- Mobility constraints (e.g., Acemoglu & Pischke 1999)
- Asymmetric information (e.g., Autor 2001)
- Complementarities (e.g., Acemoglu & Pischke 1999)

New Developments in Human Capital Theory

How could firms capture return to general training?

Possible mechanisms proposed by literature

- Mobility constraints (e.g., Acemoglu & Pischke 1999)
- Asymmetric information (e.g., Autor 2001)
- Complementarities (e.g., Acemoglu & Pischke 1999)

Mechanisms make general training de facto firm-specific training
$\Rightarrow$ Allow firm to recoup investment in general training via retention of trained workers.

This Paper

Research Question: How does investment in general HC reduce turnover?

- Which mechanisms are operating?
- What is the relative strength of mechanisms?

Examine using data on employer-financed MBA coursework

- Common context eliminates role of **asymmetric information**
- Test **complementarities** by exploiting variation in relevancy of coursework to job
- Test **mobility constraints** using service requirements following participation

Remainder of Presentation

Conceptual Framework:

- Modeling complementarities
- Empirical specification & tests

Data on MBA Students

Preliminary Results:

- Evidence of complementarities
- Limited evidence for mobility constraints
- Remaining effect of program generosity

Modeling Complementarities

Firm-specific (S) and general (G) human capital affect worker's productivity at the current firm relative to outside employers (given by λ).

Model S and G as function of tenure at the firm (τ) and coursework (c):

$$\lambda = f(S, G) = h(\tau, c, \theta c) \tag{1}$$

where θ is degree to which coursework indirectly increases S due to complementarities.

Modeling Complementarities

Firm-specific (S) and general (G) human capital affect worker's productivity at the current firm relative to outside employers (given by λ).

Model S and G as function of tenure at the firm (τ) and coursework (c):

$$\lambda = f(S, G) = h(\tau, c, \theta c) \tag{1}$$

where θ is degree to which coursework indirectly increases S due to complementarities.

Properties of h: $h_1 > 0,\ h_2 < 0,\ h_3 > 0$

λ related to voluntary turnover: Ceteris paribus,

- Decrease in $\lambda \Rightarrow$ increase in turnover propensity
- Increase in $\lambda \Rightarrow$ decrease in turnover propensity

Empirical Specification

$$T^* = \beta_1 c_i + \beta_2 \theta_i c_i + M_i \delta + X_i \gamma + \epsilon_i \quad (2)$$

where T^* is employee's turnover propensity.

Coursework measured by c: Expect $\beta_1 > 0$

Complementarities:

- Interaction between θ and c
- Test: $\beta_2 < 0$

Mobility constraints (M):

- Vector of k types of post-reimbursement service requirements (δ_k)
- $<$ 12 months, equal to 12 months, $>$ 12 months, no requirement
- Test: $\delta_k < 0$

MBA Dataset

Longitudinal dataset of MBA degree candidates

- Background survey
- Post-semester survey
  - Questions about courses taken past semester
  - Employment status & expectations
- Post-graduate survey (1-year post)
- Data collection is ongoing

Data used in analysis:

- Employed students in part-time MBA program
- 219 individuals, 566 semester-person observations
- Approx. 90% participate in tuition reimbursement program

Descriptive Statistics

Background Characteristics	Mean	St. Dev.	Program Mean
GMAT	630	58.2	622 to 632
Prior Work Experience	6.1	3.5	5.3 to 5.8
Female	51.8%	-	28% to 39%
Age	29.6	4.7	
Married or Partner	62.1%	-	
Typical Hours	44.0	5.7	
Credits completed	5.6	8.3	
Post-semester Characteristics	Mean	St. Dev.	
Annual Earnings	$71,200	$23,200	
Semester Tuition	$4,490	$3,235	
Employer Paid Tuition	$3,311	$3,000	
Semester Credits	4.0	2.9	
Cumulative Credits	16.1	11.7	(Degree is 48)

Measure of Turnover

Realized mobility in dataset

- Position change: 11%
- Employer change: 3%

Intention to Turnover:

- "What is the chance that you will voluntarily quit your job in the next 12 months?" with responses {0, 25%, 50%, 75%, 100%}
- Mean: 27.1%, St. Dev.: 29.3%
- Validation of positive relationship with actual turnover (e.g., Griffeth, et al. 2000)
- Confirmed positive significant relationship between employer change and lagged turnover intention

Measuring θ

- "After completing this course, I am more productive at my current employer than if I switched to a different employer," on 5-point scale from -2 (strongly disagree) to $+2$ (strongly agree).
- Averaged over courses taken in a semester (All, Core, Elective)
- Measured each semester (θ_S) or averaged over entire coursework (θ)

	Obs.	Mean	St. Dev.
θ^{ALL}	219	-0.01	0.77
θ^{CORE}	208	-0.09	0.78
θ^{ELEC}	134	0.15	0.91
θ_S^{ALL}	566	0.02	0.90
θ_S^{CORE}	445	-0.06	0.93
θ_S^{ELEC}	284	0.16	1.05

Outline of Results

1. Baseline model of turnover intention

2. Complementarities
   - Overall measure of θ
   - Semester measure of θ

3. Mobility Constraints
   - Service Length Requirements
   - Program "Generosity"

Baseline Results for Turnover Intention

LHS: Quit Probability	(1)	(2)	(3)
Total Credits Taken	0.006***		
	(0.001)		
Total Credits Taken, Core		0.007***	
		(0.002)	
Total Credits Taken, Elective			0.015***
			(0.004)
Tenure at Firm	0.016	0.018	0.016
	(0.013)	(0.013)	(0.012)
Tenure at Firm^2	-0.001**	-0.002**	-0.001**
	(0.001)	(0.001)	(0.001)
Work for Non-Profit	0.102	0.106	0.114
	(0.086)	(0.088)	(0.079)
Work for Government	0.168**	0.173**	0.180**
	(0.080)	(0.082)	(0.076)
Observations	563	563	563
R^2	0.156	0.142	0.156

Notes: OLS Regression. Robust standard errors in parentheses clustered at individual. Includes age, gender, marital status, typical hours, income, and semester dummies. * p<0.10, ** p<0.05, *** p<0.01.

Turnover Intention: Overall measure of θ

LHS: Quit Probability	(1)	(2)	(3)
Total Credits Taken	0.006***	0.005***	0.006***
	(0.001)	(0.001)	(0.002)
$\theta^{ALL} \times$ Total Credits	-0.008***		
	(0.001)		
$\theta^{CORE} \times$ Total Credits		-0.006***	
		(0.001)	
$\theta^{ELEC} \times$ Total Credits			-0.005***
			(0.002)
Tenure at Firm	0.014	0.021*	0.016
	(0.011)	(0.012)	(0.026)
Tenure at Firm^2	-0.001**	-0.002***	-0.002
	(0.001)	(0.001)	(0.002)
Observations	563	538	413
R^2	0.251	0.200	0.235

Notes: OLS Regression. Robust standard errors in parentheses clustered at individual. Includes age, gender, marital status, typical hours, income, sector, and semester dummies. * p<0.10, ** p<0.05, *** p<0.01.

Interpretation

Predictions of Standard HC Theory

- Turnover intention increases with total credits.
- Turnover intention related to tenure: additional tenure reduces turnover intention after 8 years.

Interpretation

Predictions of Standard HC Theory

- Turnover intention increases with total credits.
- Turnover intention related to tenure: additional tenure reduces turnover intention after 8 years.

Interaction term: Descriptive statistics for θ

- St.Dev. of $\theta^{ALL} = 0.77$
- One standard deviation **above** mean (mean of $\theta^{ALL} = -0.01$): Interaction $= -0.008 \times 0.76 = 0.006 \Rightarrow$ An increase in total credits **does not** significantly effect turnover intention.
- One standard deviation **below** mean: Interaction $= -0.008 \times -0.78 = 0.006 \Rightarrow$ An 1 unit increase in total credits predicted to increase turnover intention by 0.012.

Results robust to restricting θ to core courses.

Turnover Intention: Semester measure of θ

LHS: Quit Probability	(1)	(2)	(3)
Total Credits Taken	0.006***	0.005***	0.005**
	(0.001)	(0.001)	(0.002)
$\theta_s^{ALL} \times$ Semester Credits	-0.014***		
	(0.003)		
$\theta_s^{CORE} \times$ Semester Credits		-0.013***	
		(0.003)	
$\theta_s^{ELEC} \times$ Semester Credits			-0.013***
			(0.004)
Tenure at Firm	0.015	0.014	0.018
	(0.012)	(0.011)	(0.029)
Tenure at Firm^2	-0.001**	-0.001**	-0.002
	(0.001)	(0.001)	(0.002)
Observations	562	441	283
R^2	0.192	0.188	0.202

Notes: OLS Regression. Robust standard errors in parentheses clustered at individual. Includes age, gender, marital status, typical hours, income, sector, and semester dummies. * p<0.10, ** p<0.05, *** p<0.01.

Interpretation

Interaction term:

- St.Dev. of $\theta_S^{ALL} = 0.90$
- One standard deviation **above** mean (mean of $\theta_S^{ALL} = 0.02$):
  Interaction $= -0.014 \times 0.92 = -0.013 \Rightarrow$ An increase in 1 semester credit reduces turnover intention by 0.007 (-0.013 + 0.006).
- One standard deviation **below** mean:
  Interaction $= -0.014 \times -0.88 = 0.012 \Rightarrow$ An 1 unit increase in semester credit increases turnover intention by 0.018 (0.012 + 0.006).

Interpretation

Interaction term:

- St.Dev. of $\theta_S^{ALL} = 0.90$
- One standard deviation **above** mean (mean of $\theta_S^{ALL} = 0.02$): Interaction $= -0.014 \times 0.92 = -0.013 \Rightarrow$ An increase in 1 semester credit reduces turnover intention by 0.007 (-0.013 + 0.006).
- One standard deviation **below** mean: Interaction $= -0.014 \times -0.88 = 0.012 \Rightarrow$ An 1 unit increase in semester credit increases turnover intention by 0.018 (0.012 + 0.006).

Complementarities?

- Interpret negative interaction as complementarities in production
- Alternative: Skill-weights approach to firm-specific HC (Lazear 2009)
  - All skills are transferable, but firms differ in the weight placed on different skills.
  - Achieves same predictions of standard HC theory + provision of general skills by firms.
  - θ could be a measure of skill-weight of firm

Turnover Intention: Mobility Constraints

LHS: Quit Probability	(1)	(2)	(3)
Total Credits Taken	0.004***	0.005***	0.004***
	(0.001)	(0.001)	(0.001)
$\theta_s^{ALL} \times$ Semester Credits	-0.013***	-0.014***	-0.013***
	(0.003)	(0.003)	(0.003)
No Tuition Program	0.031		0.011
	(0.061)		(0.059)
Post-Service: Less than 12 months	0.208**		0.200**
	(0.087)		(0.090)
Post-Service: 12 months	0.094**		0.095**
	(0.045)		(0.045)
Post-Service: More than 12 months	-0.110***		-0.100**
	(0.041)		(0.042)
Amt. Paid by Employer, ($1,000s)		-0.014***	-0.010**
		(0.005)	(0.005)
Observations	562	562	562
R^2	0.247	0.205	0.253

Notes: OLS Regression. Robust standard errors in parentheses clustered at individual. Includes age, gender, marital status, typical hours, income, sector, tenure, and semester dummies. * p<0.10, ** p<0.05, *** p<0.01.

Interpretation of Mobility Constraints

Distribution of service requirements following reimbursement

- No Requirement (or no program): 54%
- Less than 12-months: 4%
- Equal to 12-months: 20%
- More than 12-months: 22%

Employees at firms with requirements of 12-months or less have significantly higher turnover intention.
Only requirements of more than 12-months significantly reduce turnover intention.

Interpretation of Mobility Constraints

Distribution of service requirements following reimbursement

- No Requirement (or no program): 54%
- Less than 12-months: 4%
- Equal to 12-months: 20%
- More than 12-months: 22%

Employees at firms with requirements of 12-months or less have significantly higher turnover intention.
Only requirements of more than 12-months significantly reduce turnover intention.

Program Generosity?

- After controlling for two mechanisms, generosity still has significant negative effect on turnover intention.
- Additional mechanisms to explore
  - Gift-exchange
  - Informal norms

Conclusion

Tuition reimbursement programs to examine mechanisms for how general training may increase retention.

Evidence that both mobility constraints and complementarities having a significant effect on turnover intention.

Relative strength of mechanisms

- Mobility constraints: Requirements of 12 months or shorter not binding
- Complementarities: Offset positive relationship between general human capital acquired through coursework and turnover intention.

Conclusion

Tuition reimbursement programs to examine mechanisms for how general training may increase retention.

Evidence that both mobility constraints and complementarities having a significant effect on turnover intention.

Relative strength of mechanisms

- Mobility constraints: Requirements of 12 months or shorter not binding
- Complementarities: Offset positive relationship between general human capital acquired through coursework and turnover intention.

Limitation:

- Consistent with skill-weights approach to firm-specific human capital.
- Program generosity has significant effect: remaining mechanisms left to examine.
- Endogeneity of total credits