Labor Finance Theory – a review

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Labor Finance is an emerging field

- Wide scope of interactions between financial and real economic activity (labor markets)
- Unlike capital goods, people can voluntarily leave, bargain, face unemployment costs, need to be trained etc.
- Topics include:
 - access to external finance vs job losses during crises
 - employment decisions in response to shocks
 - how public versus private ownership affects human capital

Asset Pricing & Labor

Chang, B., Hong, H. Selection versus talent effects on firm value. JFE (2019) Propose measuring value of labor-market hires for stock prices as a ratio of wage increases across agents of different compensation ranks to changes in output across firms.

Donangelo, Andres. Labor mobility: Implications for asset pricing. JFE (2014) Labor mobility contributes to greater operating leverage, firms in mobile industries shown to earn 5% higher returns.

Capital Structure & Labor

Sun, Q., Xiaolan, M.Z. Financing intangible capital. JFE (2019) Study labor market frictions, the impact of a firm's workforce on its capital structure, show that

high leverage makes managing labor harder.

Kim, H. How does labor market size affect firm capital structure? Evidence from large plant openings. JFE (2020)

Examine how labor market in which firms operate affects their capital structure decisions, show new plant opening leads to a 2.5pp increase in the debt-to-capital ratio of existing firms in the "winner" county relative to the "runner-up" choice.

Financing constraints & Labor. Part I

Benmelech, E., Frydman, C., Papanikolaou, D. Financial frictions and employment during the Great Depression. JFE (2019)

Using a hand-collected dataset of large industrial firms, show disruption in credit supply played a quantitatively significant role in unprecedented contraction of employment during the Great Depression.

Caggese, A., Cuñat, V., Metzger, D. Firing the wrong workers: financing constraints and labor misallocation. JFE (2019)

Financing constraints distort intertemporal trade-off between current and expected productivity, constrained firms sub-optimally fire short-tenured workers with high future expected productivity.

Chodorow-Reich, G. The employment effects of credit market disruptions: firm-level evidence from the 2008–09 financial crisis. Q. J.Econ (2014)

Using a dataset of banking relationships and employment at 2000 firms during the 2008-09 crisis show firms that had pre-crisis relationships with less healthy lenders had a lower likelihood of obtaining loan after Lehman bankruptcy, higher interest rates.

Financing constraints & Labor. Part II

Dobbie, W., Goldsmith-Pinkham, P., Mahoney, N., & Song, J. Bad credit, no problem? Credit and labor market consequences of bad credit reports. JF (2020)

Study financial and labor market impacts of bad credit reports, bankruptcy flags are strongly correlated with adverse credit market outcomes but have no predictive power for measures of job performance.

Ellul, A., Pagano, M. Corporate leverage and employees' rights in bankruptcy. JFE (2019) Show that if employees have high seniority in liquidation for unconstrained firms leverage increases more in response to shocks, for constrained firms leverage responds less.

Fonseca, J., & Van Doornik, B. Financial development and labor market outcomes: Evidence from Brazil. JFE (2022)

Credit expansion shown to have led to an increase in the skill intensity of firms and in within-firm returns to skill and to a reallocation of skilled labor from financially unconstrained firms to constrained firms.

Labor supply

Bennedsen, M., Tsoutsoura, M., Wolfenzon, D. Drivers of effort: evidence from employee absenteeism. JFE (2019)

Using employee absent spells data in 4140 firms in Denmark show firm component explains 60% of difference in absenteeism across firms, firms with stronger career incentives attract lower-absenteeism employees.

Bernstein, A. Negative home equity and household labor supply. JF (2021)

Using U.S. household-level data and plausibly exogenous variation in the location-timing of home purchases with a single lender, find negative home equity causes a 2% to 6% reduction in household labor supply.

Liquidation, Buyout & Labor

Antoni, M., Maug, E., Obernberger, S. Private equity and human capital risk. JFE (2019) Study human capital effects of private equity buyouts in Germany, find buyouts are followed by reduction in employment, salaries, administrative staff, higher demand for IT skills.

Baghai, R. P., Silva, R. C., Thell, V., & Vig, V. Talent in distressed firms: Investigating the labor costs of financial distress. JF (2021)

Importance of skilled labor exposes firms to risk of losing talent at critical times, firms shown to lose workers with the highest cognitive and noncognitive skills as they approach bankruptcy.

Bernstein, S., Colonnelli, E., Giroud, X., Iverson, B. Bankruptcy spillovers. JFE (2019)

Study externalities that bankruptcy design can impose on non-bankrupt firms, employment declines substantially in the immediate neighborhood of liquidated establishments.

Campello, M., Gao, J., Qiu, J., Zhang, Y. Bankruptcy and the Cost of Organized Labor: Evidence from Union Elections, RFS (2017)

Identify effect of worker unionization on bondholders in bankruptcy states, unionization is shown to be associated with longer, more convoluted, and costlier bankruptcy court proceedings.

Start-ups & Labor

Appel, I., Farre-Mensa, J., Simintzi, E. Patent trolls and startup employment. JFE (2019) Analyze how patent infringement claims made by non-practicing entities affect start-up's ability to grow. Using adoption of anti-troll laws in 32 US states for identification, find a 4.4% increase in high-tech start-up employment.

Chen, J., Hshieh, S., & Zhang, F. The role of high-skilled foreign labor in startup performance: Evidence from two natural experiments. JFE (2021)

Examine the role of high-skilled foreign labor in VC-backed start-ups, show high-skilled foreign workers possess skills difficult to replace, barriers to securing H-1B visas lower startups' innovation.

Hacamo, I., & Kleiner, K. Forced entrepreneurs. JF (2022)

Find that compared to voluntary entrepreneurs, firms founded by forced entrepreneurs are more likely to survive, labor shocks disproportionately impact high-earners and they start more successful firms.

Financing constraints distort employment decisions

Caggese, Cuñat, Metzger. Firing the wrong workers: Financing constraints and labor misallocation. JFE, 2019

- Financing constraints distort intertemporal trade-off between current and expected productivity, hiring and firing costs.
- Constrained firms fire short-tenured workers with high future expected productivity.
- Use credit ratings, exchange rate data to identify financing constraints, demand shocks.

Model. Value of long-tenured workers



Model. Value of short-tenured workers



Model. Employment decisions – Free Entry Condition



Data

- Swedish firm employer-employee data for 1998–2010 from the Swedish Companies Registration Office (Bolagsverket)
- Rating information from UC AB
- International trade data from Statistics Sweden
- "longitudinal integration database for health insurance and labor market studies" (LISA) from Statistics Sweden (SCB)

97607 firm-year observations

Regression Discontinuity Design

High appreciation of krona against currency basket $y_{ft} = \alpha + \delta_f + \gamma_{st} + P(risk \ forecast) + \beta_1 Shock_{ft-1}$ $+\beta_2(C_{ft}*Shock_{ft-1})+\beta_3C_{ft}+\varepsilon_{ft}.$ Rating – constrained? Worker-level $y_{ift} = \alpha + \beta_1 Shock_{ft-1} + \beta_2 Short_tenured_{it}$ $+\beta_3 C_{ft} + \beta_4 (C_{ft} * Shock_{ft-1})$ $1[tenure \leq 2 years]$ $+\beta_5(Short_tenured_{it} * Shock_{ft-1})$ $+\beta_6(C_{ft} * Short_tenured_{it} * Shock_{ft-1}) + \varepsilon_{it}$

Firm-level

Hypotheses

Hypothesis 1. The more financially constrained a firm is, the more likely it fires a short-tenured worker, and the less likely it fires a long-tenured worker.

Hypothesis 2. The more financially constrained a firm is, the younger the tenure profile of its labor force is.

Hypothesis 3. A financially unconstrained firm reduces employment by firing relatively more long-tenured workers than it would during normal times.

Hypothesis 4. A more financially constrained firm fires workers with shorter tenures.

Measuring value of labor hires

Chang, Hong. Selection versus talent effects on firm value. JFE, 2019

- Goal: measure value of labor-market hires for stock prices
- Considered: IPO underwriters (reduce cost of capital), CEOs (increase firm productivity)
- Importance of talent (agent) relative to selection (firm) $\sim \Delta wage$

 $\Delta Output$

 Median of this ratio is 0.5% for underwriters and 2% for CEOs.

Model. Expected profit of firm y hiring agent h



Model. Assignment function $\mu: Y \to H \cup \{\emptyset\}$



Model. Ratio of slopes



Value of CEOs

• S&P 1500 CEO compensation for 1993-2014



Talent effect for CEOs



Corporate leverage vs Employee Rights

Ellul, Pagano. Corporate leverage and employees' rights in bankruptcy. JFE, 2019

- Corporate leverage response to employees' rights in bankruptcy
- Financially unconstrained: leverage increases more in response to positive shocks if employees have high seniority in liquidation and weak rights in restructuring
- Financially constrained: leverage responds less if employees have higher seniority

Strategic Debt Model. Timeline



Strategic Debt Model. Worker compensation



Strategic Debt Model



Data

- Accounting data from Worldscope and Osiris (outside US) and Compustat for 1988-2015
- Workers' employment protection and union density from the OECD
- Real estate price data from the Bank for International Settlement database
- Commodity prices from Bloomberg
- Legal rights of employees in bankruptcy from a detailed questionnaire submitted to law firms

Sample: 22592 firms from 29 countries over the period 1988–2015

Regression

$$\begin{aligned} \Delta D_{ijct} &= (\lambda_0 + \lambda_1 \theta_c + \lambda_2 \gamma_c + \lambda_3 \alpha_c + \lambda_4 \beta_c) \cdot S_{ijt-1} \\ &+ \delta' X_{ijct-1} + \mu_{cjt} + \varepsilon_{ijct} \end{aligned}$$

i, j, c, t index firms, industries, countries, and years ΔD_{ijct} - change in leverage ratio (debt to assets) S_{ijt} - shock, change in real estate value or EBITDA θ_c - employees' seniority γ_c - public insurance α_c - worker bargaining power (union density) β_c - worker rights in debt renegotiation X_{ijct} - firm controls (size, tangibility, M/B, investment)

 μ_{cjt} - country-industry-time effects

Results

	Unconstrained firms		Constrained firms	
	(1)	(2)	(3)	(4)
Real estate shock \times Worker seniority Real estate shock \times	0.0158*** (4.16) 0.0122**	0.0155*** (4.01) 0.0119**	-0.0091** (-2.62) -0.0058**	-0.0087** (-2.55) -0.0054*
Government insurance coverage Real estate shock × Union density	(2.10) 0.0016*** (3.50)	(1.99) 0.0015*** (3.41)	(-2.08) -0.0011** (-2.59)	(-1.91) -0.0010** (-2.43)
Real estate shock × Worker rights in restructuring Real estate shock	-0.0102** (-2.48) 0.0402*** (7.18)	-0.0099** (-2.39) 0.0378*** (7.04)	0.0031* (1.68) 0.0383*** (8.41)	0.0027 (1.46) 0.0371*** (8.22)
Firm control variables Fixed effects	No Country-industry- year	Yes Country-industry-year	No Country-industry- year	Yes Country-industry-year
<i>R</i> ² Number of observations	0.09 115,019	0.10 115,019	0.07 176,409	0.07 176,409
		Supports strategic leverage		Supports credit rationing

Financial Markets Affect Labor Markets

Mitra, I., & Xu, Y. (2020). Time-varying risk premium and unemployment risk across age groups. *The Review of Financial Studies*, *33*(8), 3624-3673.



Financial Markets Affect Labor Markets

Time-varying risk premium (BAA-AAA credit spread, take as given)
Discount rate and Firms' hiring and firing policies
Disproportionately affects young workers relative to prime-age workers

Labor search and matching model based on Diamond-Mortensen-Pissarides (1982, 1994, 1985), adding:

- 1. time varying risk premium and
- 2. firms learning about heterogenous worker productivity

Financial Markets Affect Labor Markets

Predictions: 1. Unemployment gap is larger when RP is higher (time-series) and 2. is more cyclical in high beta industries (cross-section)

Empirical support (data from five sources, regressions, no IV or DiD)

Labor Features Affect Financial Markets

Donangelo, A., Gourio, F., Kehrig, M., & Palacios, M. (2019). The cross-section of labor leverage and equity returns. *Journal of Financial Economics*, *132*(2), 497-518.

• Labor Leverage: The relative inflexibility of labor expenses lead to a form of operating leverage

1.0% reduction in sales: 1.08% in non-labor costs; 0.53% in labor costs

- Lack of theoretically supported empirical measure of labor leverage
- Identify two sufficient conditions for labor leverage mechanisms:
 1. wages are smoother than shocks to a firm's output, and
 2. labor and capital are strict complements in production
- Theoretically support using firm-level labor share to measure labor leverage

Labor Features Affect Financial Markets

- Consider three alternative measures of labor share based on Compustat or confidential firm-level Census data
- Theoretically and empirically, high labor share firms
 1. have operating profits that are more sensitive to economic shocks and
 2. have higher expected returns and higher betas
- Regressions, still no IV, DiD, or other causal identification strategies

Financial Model of Labor Occupation Choice

Catherine, S. (2022). Keeping options open: What motivates entrepreneurs?. *Journal of Financial Economics*, 144(1), 1-21.

Entrepreneurs appear to earn less and bear more risk than employees (Hamilton, 2000; Moskowitz and Vissing-Jorgensen, 2002)

Earnings data may understate the benefits of entrepreneurship: 1. Unobserved benefits: nonpecuniary (psychic) benefits, unreported earnings, and

legal tax avoidance

2. Option to return: Cross-sectional studies overstate the downsides of entrepreneurship by overlooking entrepreneurs' option to return to paid employment if they fail

Financial Model of Labor Occupation Choice

Risk-averse agents can become entrepreneurs and later return to paid employment $V_{it} = \mathbb{E}_{t} \sum_{s=t}^{R-1} \beta^{s-t} \frac{\left(C_{it} + \mathbf{1}_{K_{it} > 0}B\right)^{1-\gamma}}{1-\gamma} + \beta^{R-t} V_{iR}, \qquad (1) \begin{cases} z_{1,it_{0}} = \underbrace{\bar{z}}_{industry mean} + \underbrace{v_{1,i}}_{observed} + \underbrace{v_{2,i}}_{unknown} \\ v_{1,i} \sim \mathcal{N}(0, \sigma_{v,1}^{2}) \\ v_{2,i} \sim \mathcal{N}(0, \sigma_{v,2}^{2}) \end{cases}$ (5) $\Pi_{it} = (1-\tau) \left[e^{z_{it}} K_{it}^{\alpha} - \delta K_{it} - r_{D} D_{it} \right], \qquad (2) \qquad Randomly assigned to agents$

1. While they are entrepreneurs, individuals learn about the productivity of their firm and enjoy unobserved benefits

2. While they are employed or return to paid employment, they earn wages

Financial Model of Labor Occupation Choice

- Quantitative estimates of unobserved benefits and the value of option to return:
 1. Unobserved benefits add up to 90,700€ over the average entrepreneurial spell
 2. For new entrepreneurs, the option is worth 136,000€ in 2018
 - 3. Explain 42% of firm creations
- Estimation Strategy: Simulated Method of Moments

Future Research Directions

Open Banking

How does labor composition change with the advent of open banking?

• Machine Learning

Novel ML methods, datasets, how does AI affect the labor market?

• Fintech

How does demand for labor react to fintech disruption?

• COVID-19

How did remote work affect productivity?

• Labor as input to Data generation How to measure the value of data?