

Commitment and Competition

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CHANGING STRUCTURE OF FINANCE

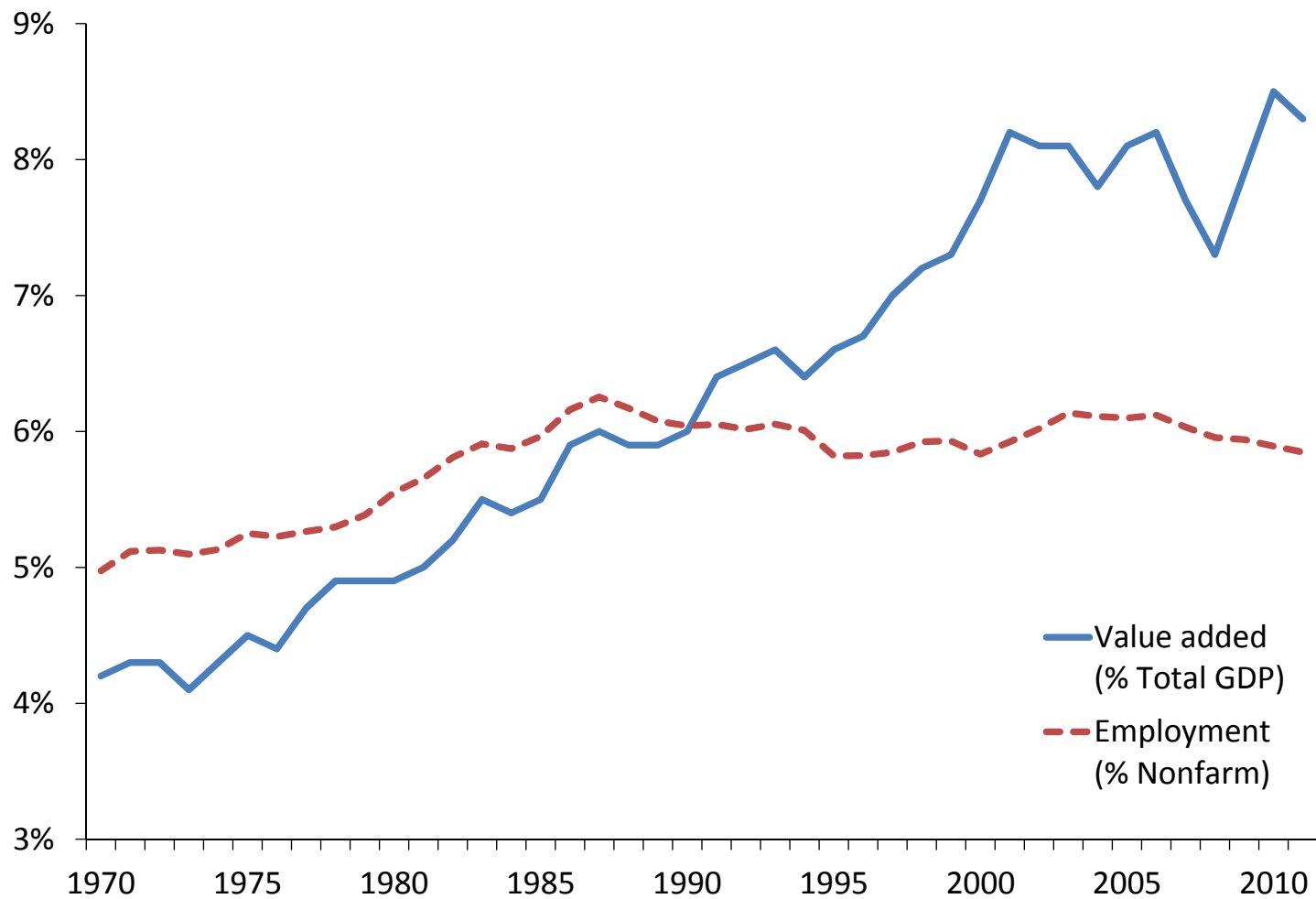
Starting in the 1970s, there has been significant changes in the **organizational structure** of the financial industry.

- In 1970 NYSE relaxed the rules for member firms to be public companies.
- Many financial firms moved away from partnership to corporations:
 - Merrill Lynch went public in 1971
 - Bear Stearns 1984
 - Morgan Stanley 1985
 - Lehman Brothers 1994
 - Goldman Sachs 1999
- Banking liberalization.

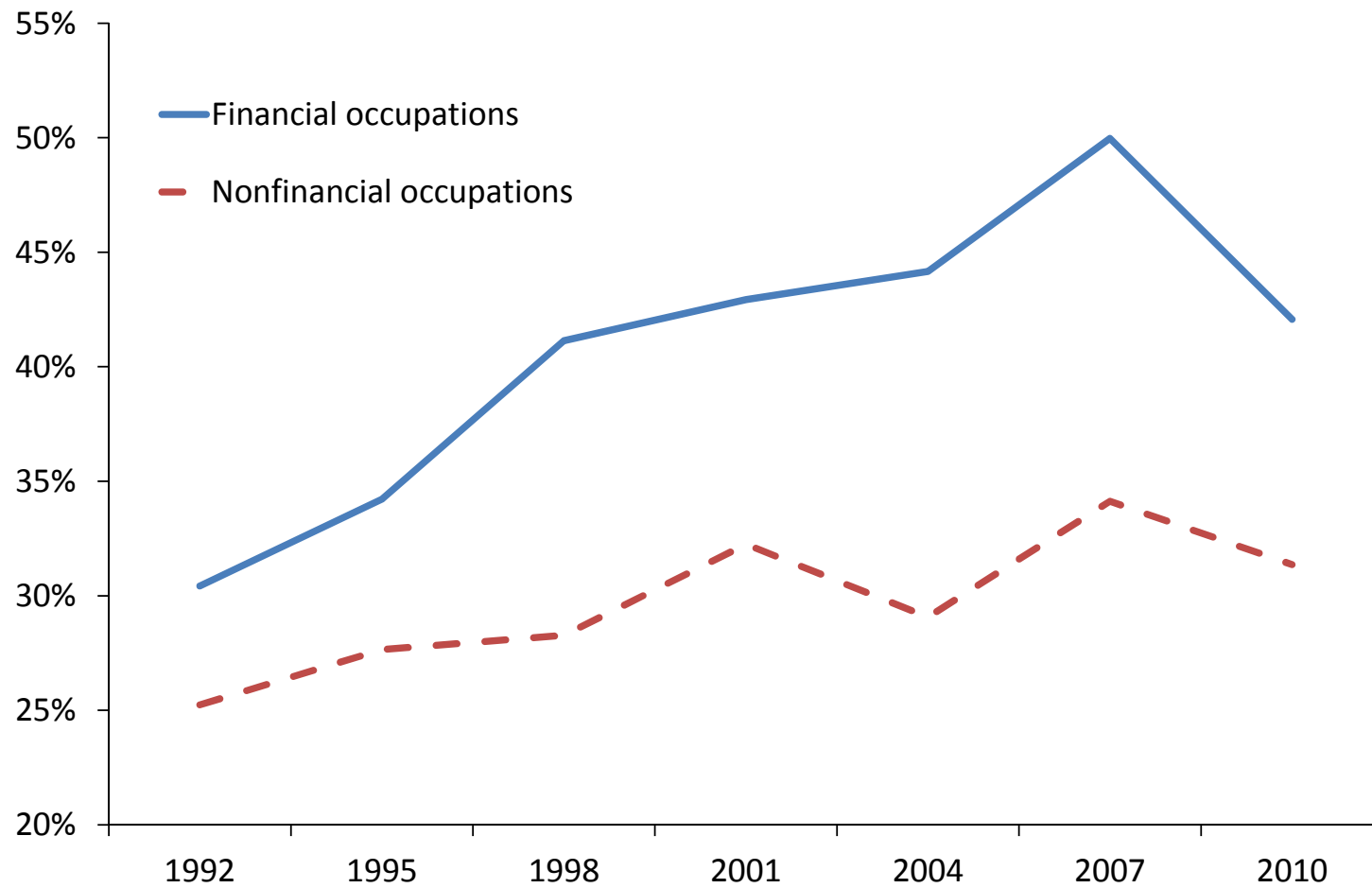
OTHER CHANGES IN FINANCE

1. Increasing size of the financial sector.
2. Increasing 'labor productivity' in the financial sector.
3. Increasing compensation in the financial sector and greater income inequality.

Size of Finance and Insurance



Income Share Top 5%



IN THIS PAPER

We propose a theory where these facts could be the consequence of the change in organizational structure: from partnerships to public companies.

EFFECTS OF THE ORGANIZATIONAL CHANGES

(From partnerships to public companies)

1. Weakened commitment

The separation of ownership from management implies the firm has a lower commitment toward the manager. (Contractual inefficiency)

2. Increased competition for managers

Competition increases turnover of managers and reduces mismatches. This in turn increases the incentive to invest in human capital. (Equilibrium benefits)

RESULTS

We show that the organizational change leads to

- Larger size of the financial sector;
- Higher 'labor' productivity';
- Greater income inequality.

REMARK

- The model is general, not specific to the financial industry.
- We focus on finance only because the organizational changes in this sector have been more extensive than other sectors.

PRESENTATION PLAN

1. Describe a simple two-period model to illustrate the key mechanism.
2. Extend the model with additional features. We calibrate the model to 1970s data and shows the effects of the organizational change.
3. Provide some empirical support for the theory.

SIMPLE MODEL

- Two periods, 1 and 2.
- In period 1 a manager is matched with a firm and produces \bar{A} .
- In period 2 production is either \bar{A} or \underline{A} with probability $\frac{1}{2}$.
- In period 2, before production, with probability ρ , the manager could re-match with another firm. Production in the new firm is \bar{A} .

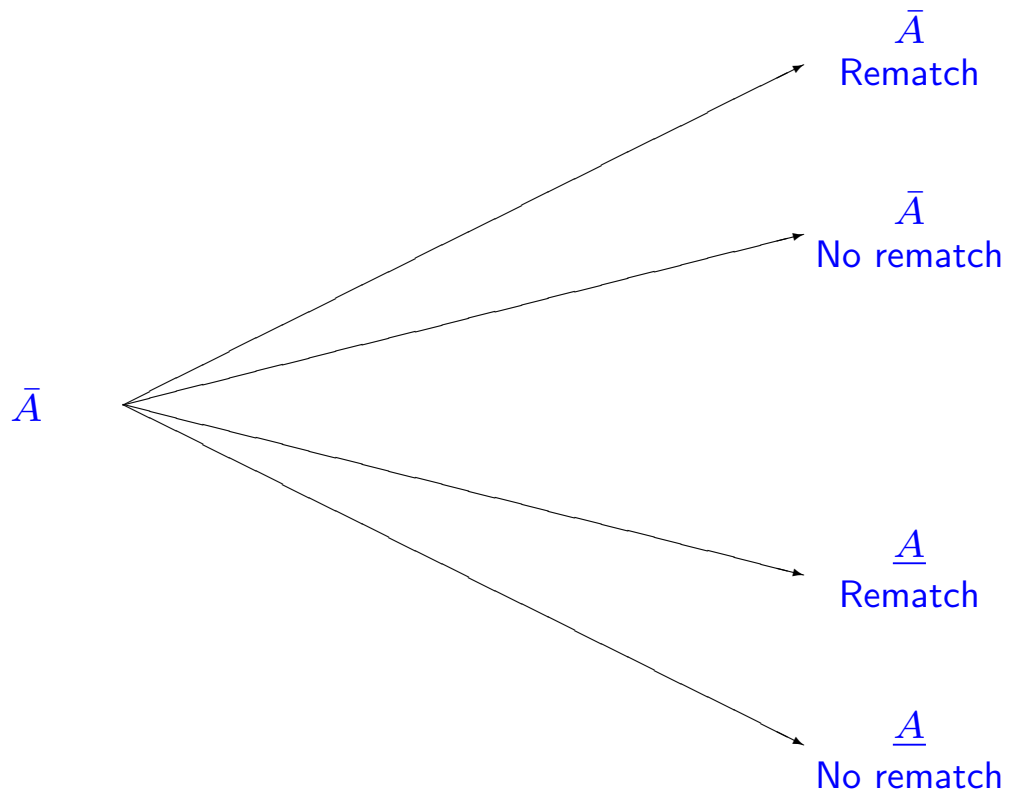
Further details:

- The manager has outside options D_1 and D_2 .
- The firm has all the bargaining power.

TIMING

PERIOD 1

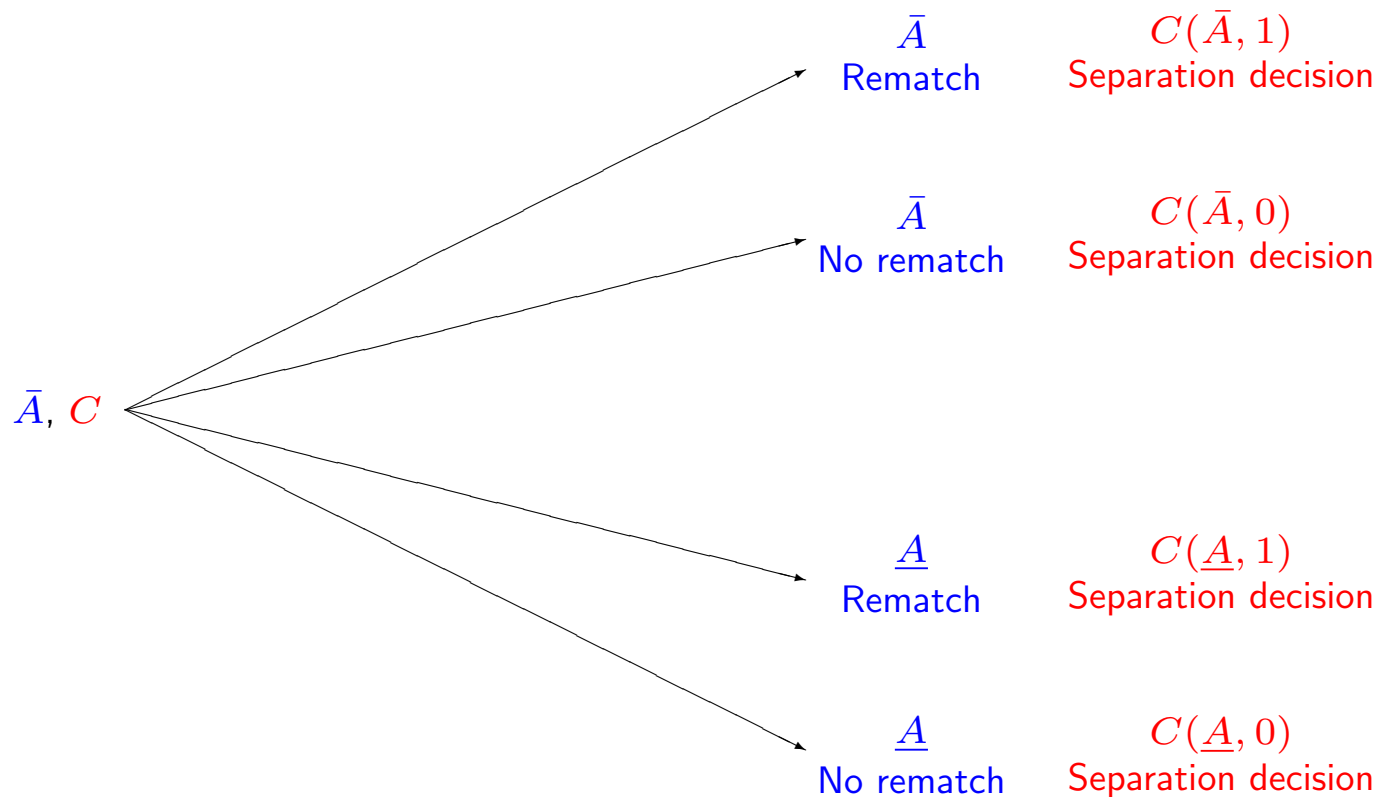
PERIOD 2



COMPENSATION AND SEPARATION

PERIOD 1

PERIOD 2



CONTRACTUAL ENVIRONMENT

1. Partnership: One-sided commitment

- Partners can quit.
- The investor is the **representative of partners**. No reneging on partners.

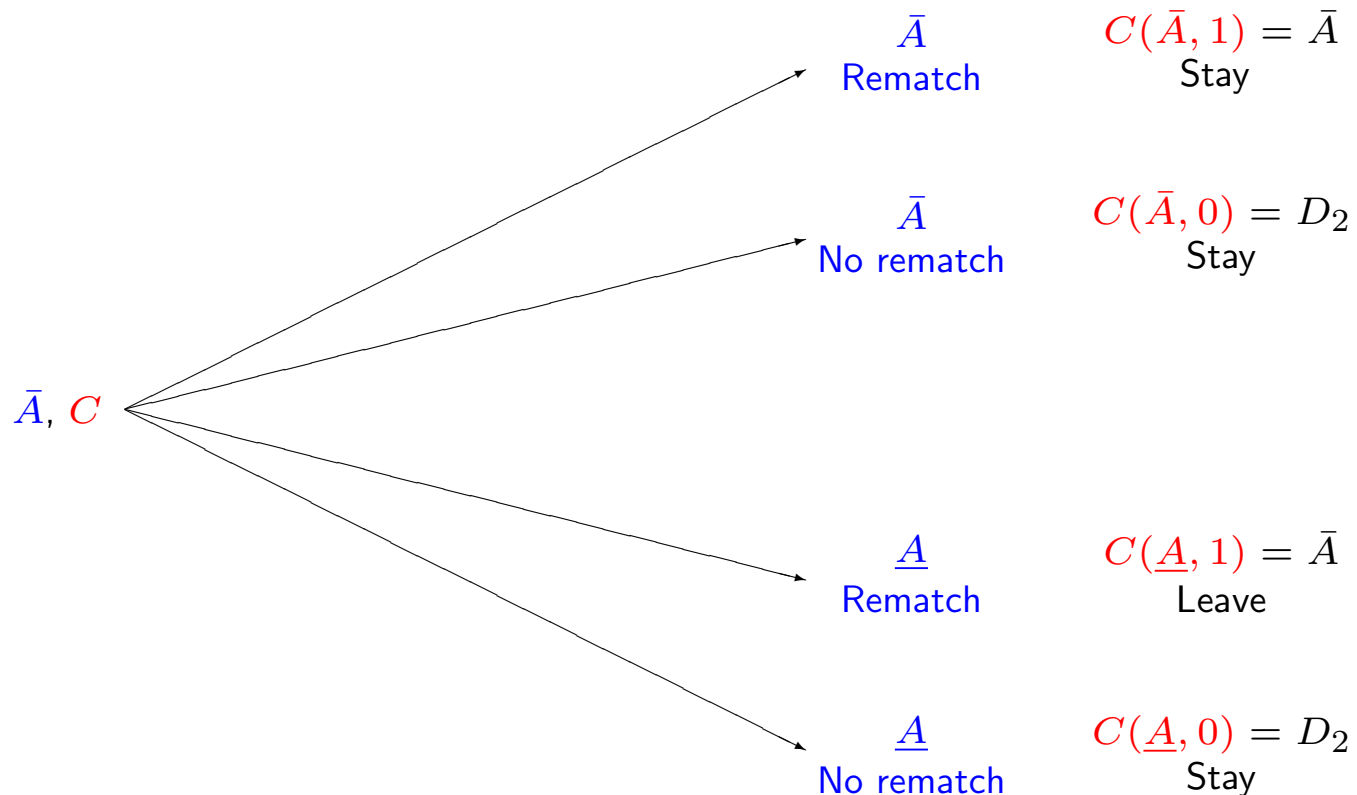
2. Public company: Two-sided limited commitment

- Partners can quit.
- The investor is the **representative of shareholders**, not managers. Reneging past promises to managers becomes possible.

PARTNERSHIP (One-sided commitment)

PERIOD 1

PERIOD 2



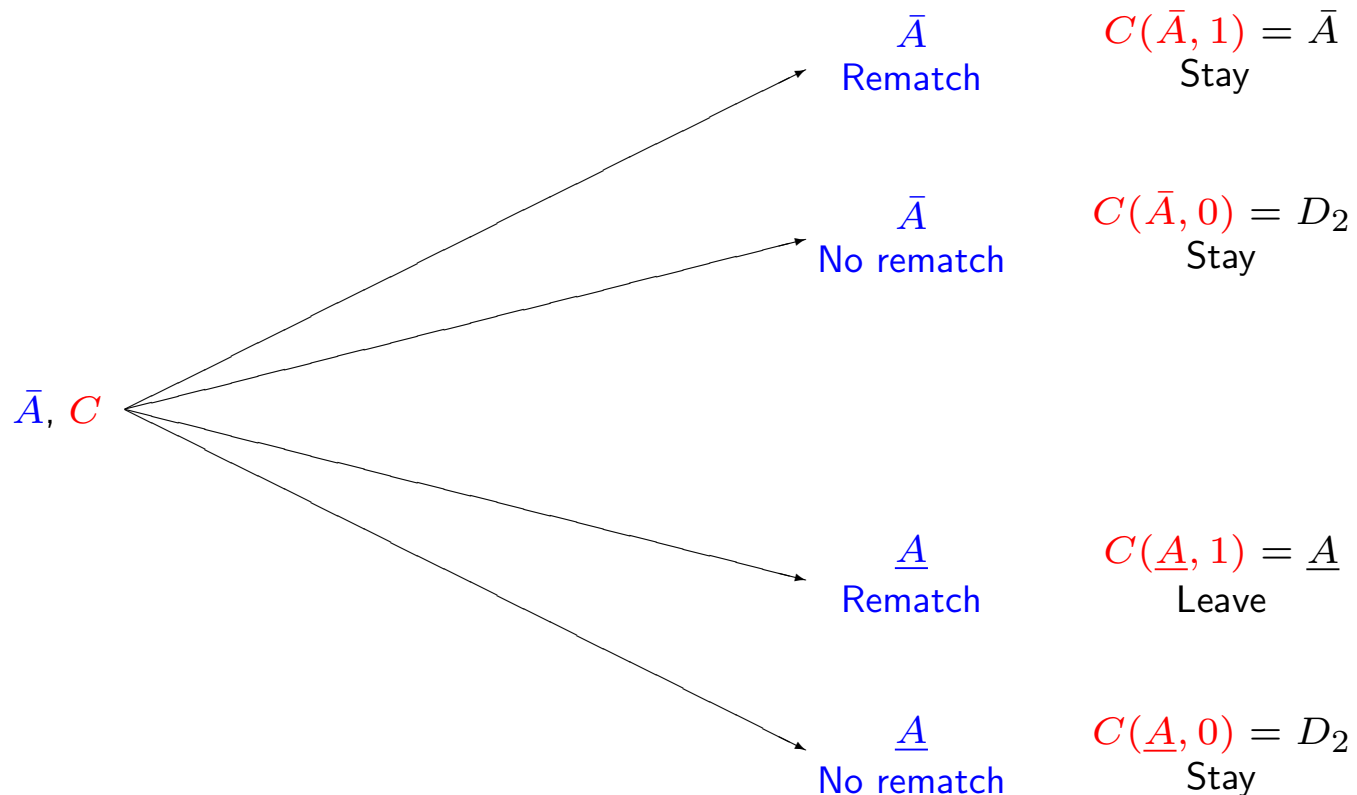
$$C + \frac{\rho}{2}C(\bar{A}, 1) + \frac{1-\rho}{2}C(\bar{A}, 0) + \frac{\rho}{2}C(\underline{A}, 1) + \frac{1-\rho}{2}C(\underline{A}, 0) = D_1$$

PUBLIC COMPANY

(Two-sided limited commitment)

PERIOD 1

PERIOD 2

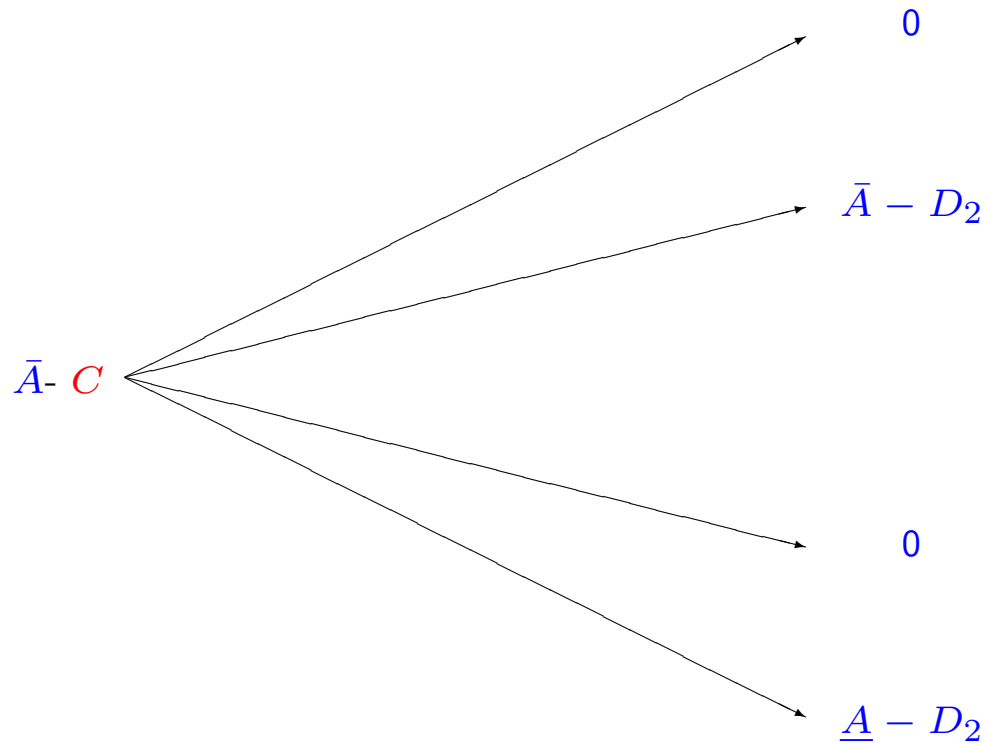


$$C + \frac{\rho}{2}C(\bar{A}, 1) + \frac{1-\rho}{2}C(\bar{A}, 0) + \frac{\rho}{2}C(\underline{A}, 1) + \frac{1-\rho}{2}C(\underline{A}, 0) = D_1$$

PARTNERSHIP (Profits)

PERIOD 1

PERIOD 2

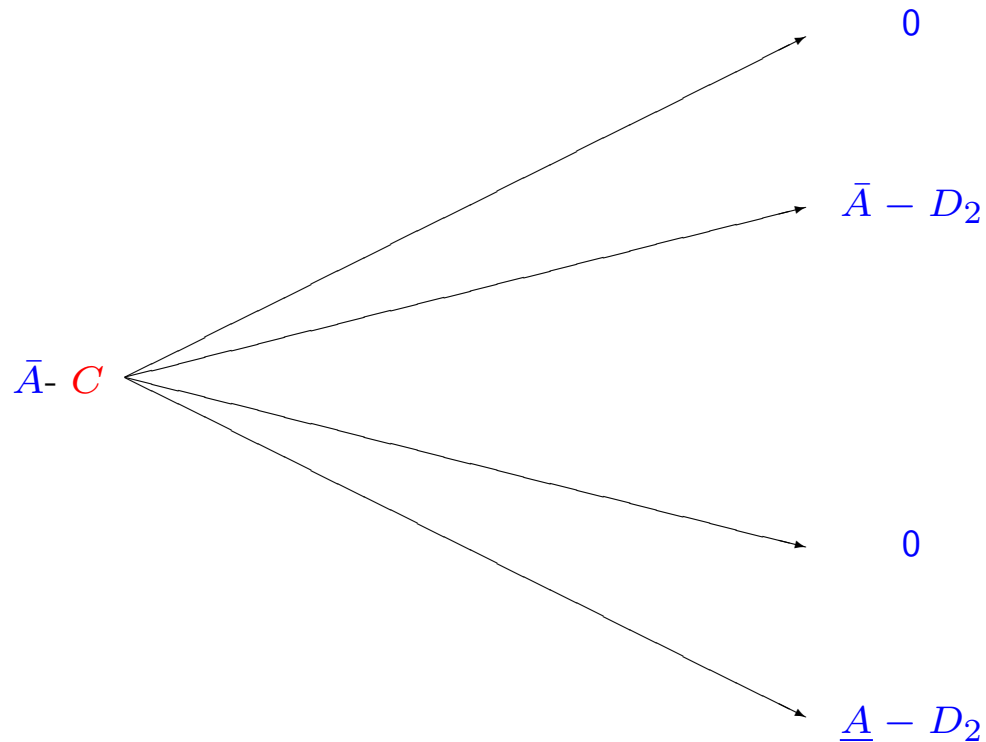


$$C = D_1 - \frac{\rho}{2}\bar{A} - \frac{1-\rho}{2}D_2 - \frac{\rho}{2}\underline{A} - \frac{1-\rho}{2}D_2 \quad \text{Profit new firm}=0$$

PUBLIC COMPANY (Profits)

PERIOD 1

PERIOD 2



$$C = D_1 - \frac{\rho}{2}\bar{A} - \frac{1-\rho}{2}D_2 - \frac{\rho}{2}\underline{A} - \frac{1-\rho}{2}D_2 \quad \text{Profit new firm} = \bar{A} - \underline{A}$$

EQUILIBRIUM CONSEQUENCES

- With **one-sided** commitment, new firms will make zero profits.
 - In equilibrium no vacancies will be posted.
 - Managers are not reallocated to more profitable matches.
- With **two-sided** limited commitment, new firms will make positive profits.
 - In equilibrium vacancies will be posted.
 - Some managers are reallocated to more profitable matches.

ADDITIONAL FEATURES

- Suppose that:
 - Investment decisions in period 1 affect, *stochastically*, the manager's human capital in period 2.
 - The manager's human capital is transferable.
 - Human capital is more productive in high quality matches.
- Then, with **public companies** there is more accumulation of human capital which in turn implies:
 - Higher value added per worker.
 - Higher contribution to aggregate production (larger size).
 - Higher dispersion of compensation (inequality).

GENERAL MODEL

- Managers:

- Characterized by human capital h_t and lifetime utility

$$\mathbb{E}_t \sum_{t=0}^{\infty} \beta^t \ln(C_t),$$

C_t =Consumption.

- Investors:

- With lifetime utility

$$E_t \sum_{t=0}^{\infty} \beta^t \tilde{C}_t$$

\tilde{C}_t =Consumption.

Technology

- Two investment opportunities, safe and risky:

$$R_{t+1}^s = A_t \min \left\{ K_t^s, h_t^s \right\}$$

$$R_{t+1}^r = z_{t+1} A_t \min \left\{ K_t^r, h_t^r \right\}$$

$$A_t \in \{\underline{A}, \bar{A}\}, \quad \text{Persistent matching quality}$$

$$z_{t+1} \in \{\underline{z}, \bar{z}\}, \quad \text{Unanticipated iid productivity, } \mathbb{E}z > 1$$

Assumption 1. *The initial matching quality is always $A_t = \bar{A}$. After that, with probability θ it drops permanently to $A_t = \underline{A}$.*

- Given the portfolio choice λ_t , the investment return is

$$R_{t+1} = R_{t+1}^s + R_{t+1}^r = \left[1 + \lambda_t(z_{t+1} - 1) \right] A_t h_t.$$

-
- The management of risky investments requires a cost

$$e(\lambda_t)K_t$$

- Dynamics of human capital,

$$h_{t+1} = h_t + \kappa R_{t+1}$$

- Value of a firm

$$V_0 = \mathbb{E}_0 \sum_{t=0}^{\infty} \beta^t (\Pi_t - C_t),$$

$$\Pi_t = \pi(A_t, \lambda_t)h_t,$$

$$h_{t+1} = g(A_t, \lambda_t, z_{t+1})h_t.$$

Market for managers

- Free entry with search for employed and unemployed managers.
- Firms post vacancies that specify A and h .
- Cost of vacancy τh_t .
- Matches are determined by a standard matching function.
- Bargaining determines the initial value for the manager,

$$\hat{Q}^{Nash}(Q_t, h_t) = \arg \max_{\hat{Q}_t} V(\bar{A}, \hat{Q}_t, h_t)^\eta (\hat{Q}_t - Q_t)^{1-\eta}$$

Q_t = Value of existing job

CONTRACTUAL ENVIRONMENT

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2. Public company: Two-sided limited commitment

- Partners can quit.
- The investor is the [representative of shareholders](#), not managers. Reneging past promises made to managers becomes possible.

ONE-SIDED COMMITMENT

(The partnership)

$$\mathbf{s}' = (A', z', \xi')$$

$$V(A, Q, h) = \max_{\lambda, C, \omega(\mathbf{s}'), Q(\mathbf{s}')} \left\{ \pi(A, \lambda)h - C + \beta \mathbb{E} \omega(\mathbf{s}') V(A', Q(\mathbf{s}'), h') \right\}$$

s.t.

$$Q = u(C) + \beta \mathbb{E} \left[\omega(\mathbf{s}') Q(\mathbf{s}') + (1 - \omega(\mathbf{s}')) D(\hat{Q}^{Max}(h'), h', \xi') \right],$$

$$Q(\mathbf{s}') \geq D(\hat{Q}^{Max}(h'), h', \xi'),$$

$$h' = g(A, \lambda, z')h.$$

TWO-SIDED LIMITED COMMITMENT

(The public company)

$$s' = (A', z', \xi')$$

$$V(A, Q, h) = \max_{\lambda, C, \omega(s'), Q(s')} \left\{ \pi(A, \lambda)h - C + \beta \mathbb{E} \omega(s') V(A', Q(s'), h') \right\}$$

s.t.

$$Q = u(C) + \beta \mathbb{E} \left[\omega(s') Q(s') + (1 - \omega(s')) D(Q^{s'}, h', \xi') \right]$$

$$Q(s') \geq D(\hat{Q}^{Max}(h'), h', \xi').$$

$$h' = g(A, \lambda, z')h$$

$$V(A', Q(s'), h') \geq 0$$

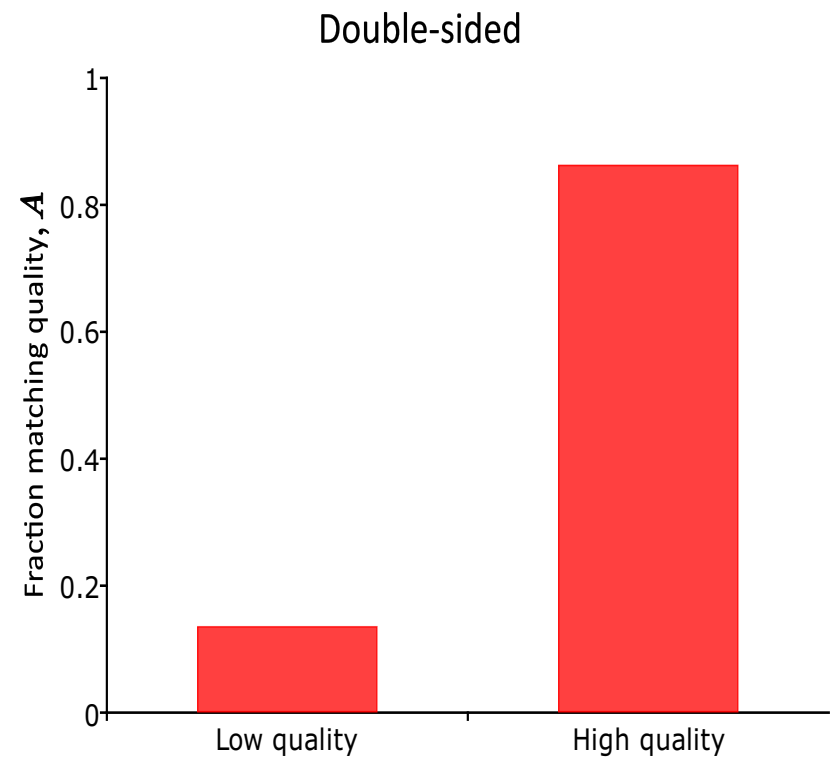
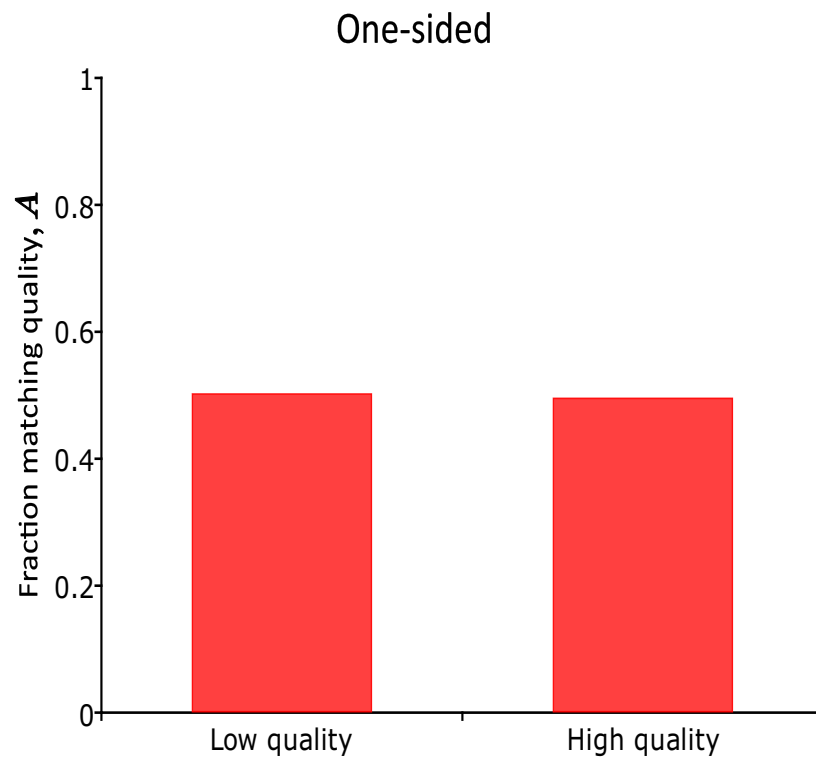
$$V(A', Q^{s'}, h') = 0$$

Parameter values

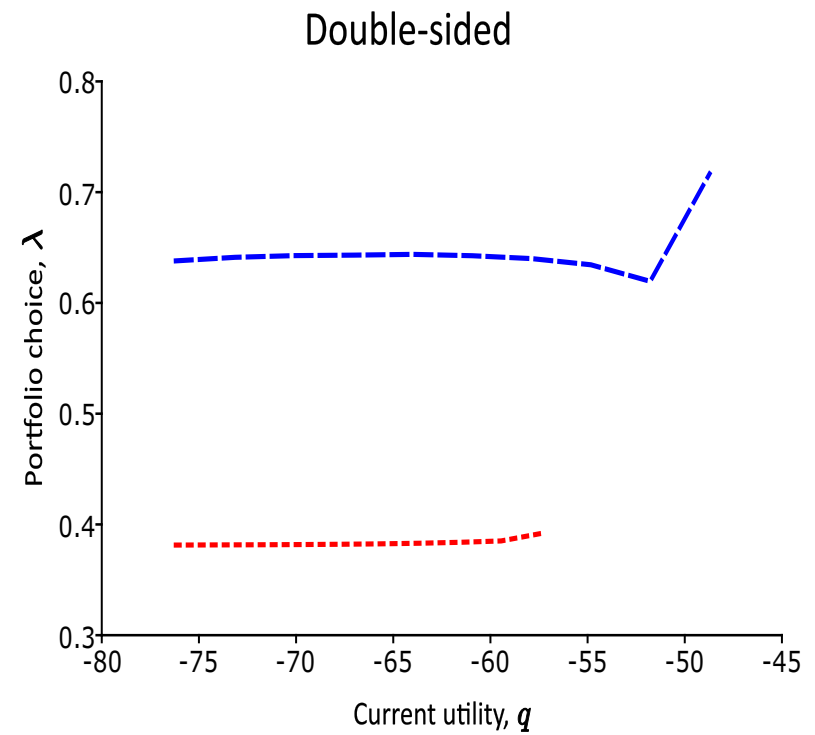
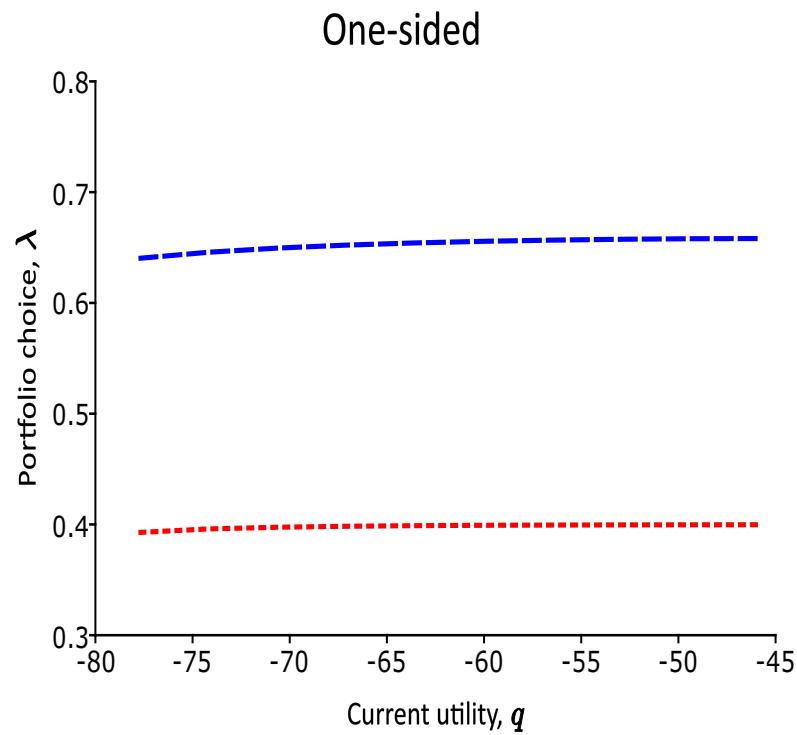
Description	Value
Intertemporal discount rate/Interest rate	$r = 0.04$
Survival probability	$\varpi = 0.975$
Matching function efficiency and bargaining	$\bar{m} = 0.5, \eta = 0.5$
Consumption when unemployed	$\underline{c} = 0.0001$
Matching quality	$\underline{A} = 0.05, \bar{A} = 0.075, \theta = 0.026$
Risky investment iid shock	$\underline{z} = -6.5, \bar{z} = 9.5, p = 0.5$
Cost of risky investment	$\alpha = 0.032$
Human capital dependence on investment return	$\kappa = 0.232$
Cost of posting a vacancy	$\tau = 0.35$

THE EFFECTS OF CHANGING THE ORGANIZATIONAL STRUCTURE

Mismatch (mis-allocation)



Portfolio choice, λ



..... Low match, \underline{A} - - - High match, \bar{A}

More properties

	<i>One-sided</i>	<i>Two-sided</i>
Probability of matching when unemployed	0.278	0.281
Probability external offer	0.000	0.139
Job separation	0.025	0.045
Fraction of high quality matches	0.500	0.863
Average matching quality	0.062	0.072
Per-capita human capital	2.868	6.474
Human capital growth (average)	0.018	0.022
Human capital growth (standard deviation)	0.069	0.085
Gini index for human capital	0.504	0.745
Share of human capital top 5%	0.344	0.640
Share of human capital top 1%	0.182	0.496
Share of human capital top 0.1%	0.071	0.335
Utility value unemployed manager	-77.682	-76.193
Utility value new match for unemployed manager	-60.965	-59.297
Firm value when matched with unemployed manager	0.389	0.393

Changing the organizational structure

- Suppose we are in the steady state with one-sided commitment (partnerships).
- What would be the value of a new firm that starts in the form of a public company?

	<i>Partnership</i>	<i>Public company</i>
Probability new match when unemployed	0.278	0.278
Probability external offer	0.000	0.139
Initial value for the manager, q_t	-60.965	-59.804
Initial value for the firm, $v_t(q_t)$	0.389	0.402

SUMMARY OF PREDICTIONS

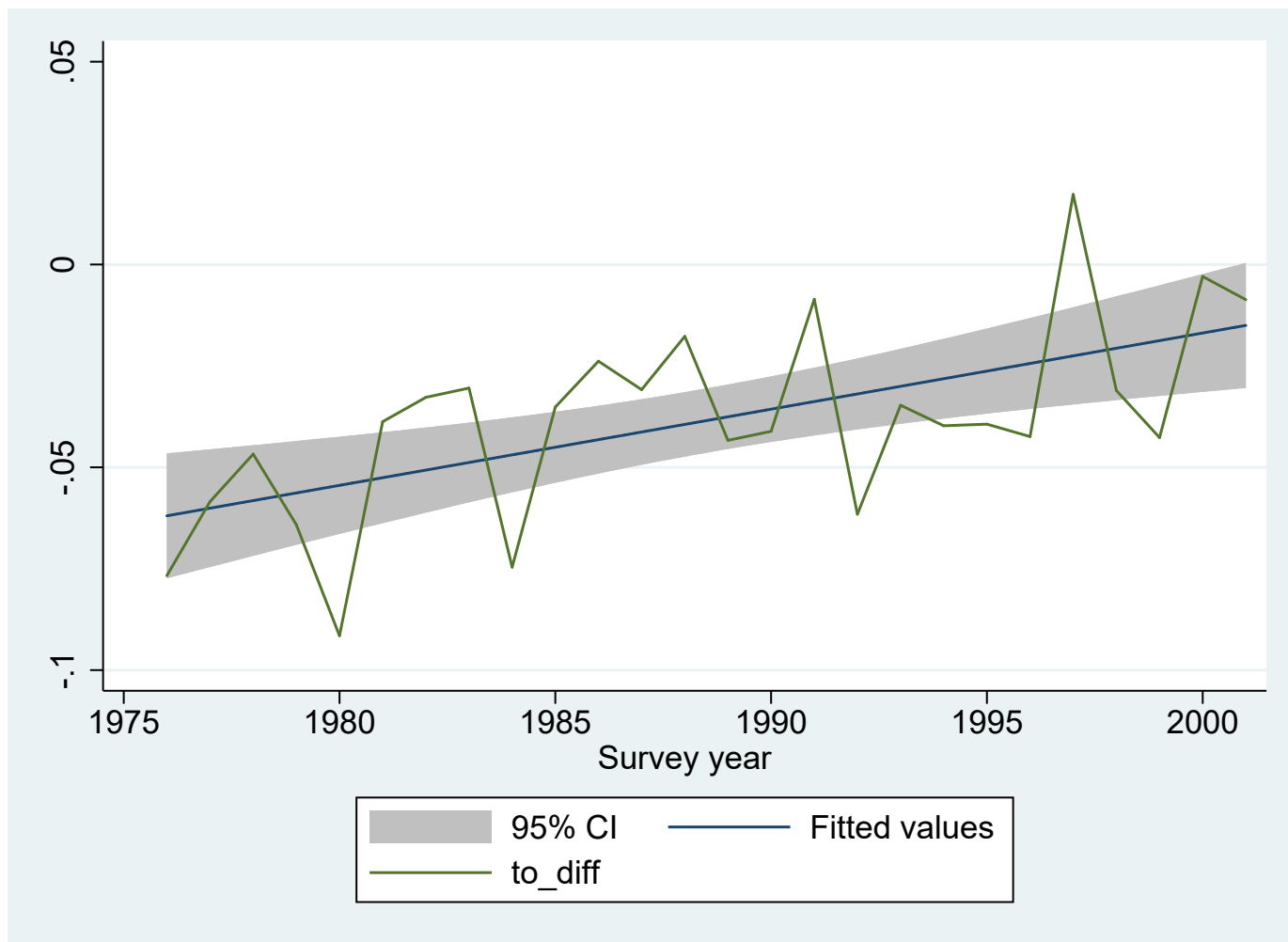
1. Higher turnover in finance.
2. Higher per-capita income in finance.
3. Higher dispersion of income in finance.
4. Idiosyncratic volatility in finance.

EMPIRICAL EVIDENCE

- Current Population Survey (annual files).
- Sample period: 1976-2000.
- Labor earnings (wages) is the income variable.
- Sample restricted to
 - Males;
 - Employed full-time.
- Finance industry includes
 - Banking and credit agencies;
 - Security and commodity brokerage and investment companies.

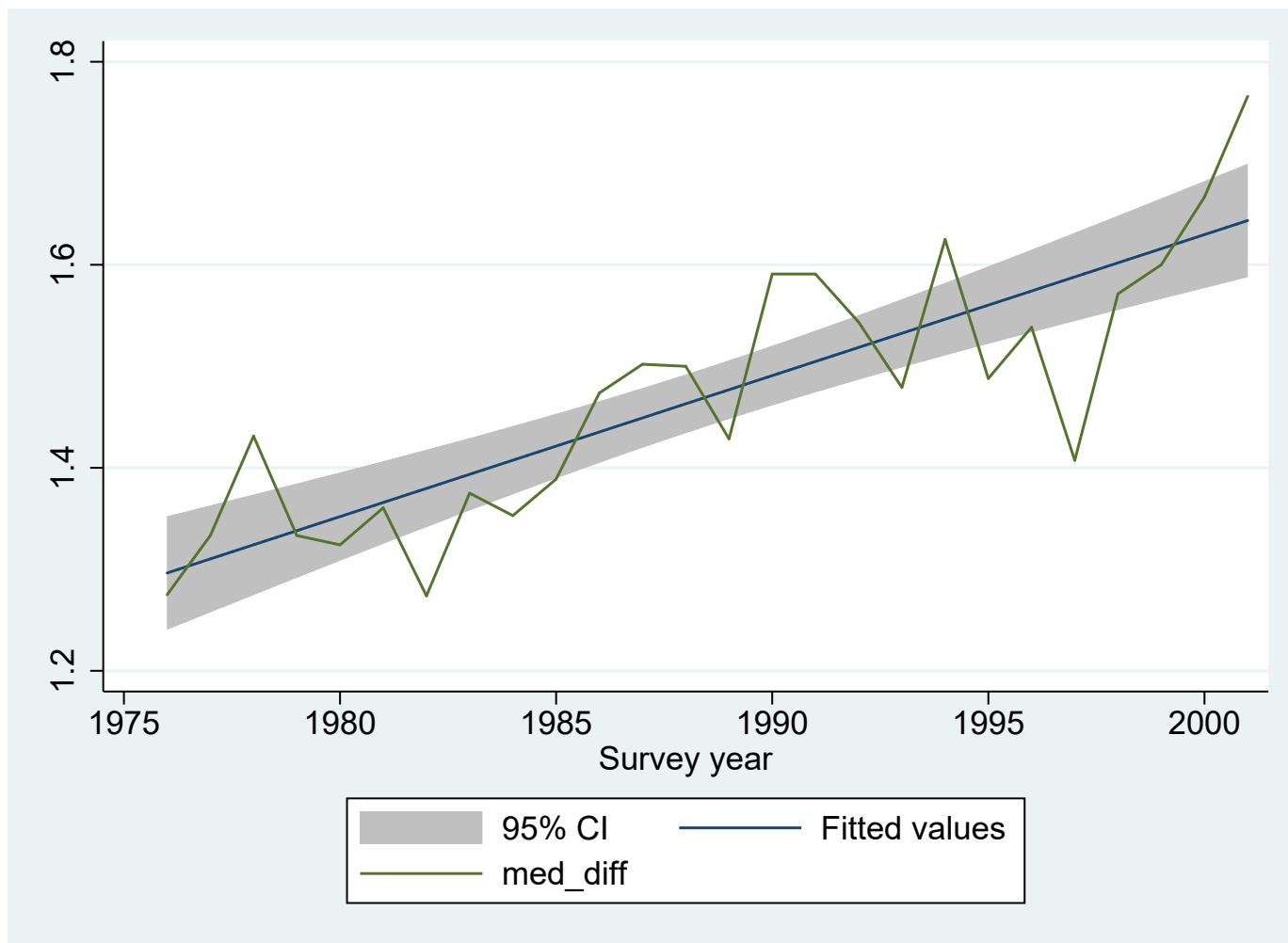
1. Turnover rate

(Turnover in finance minus turnover in non-finance)

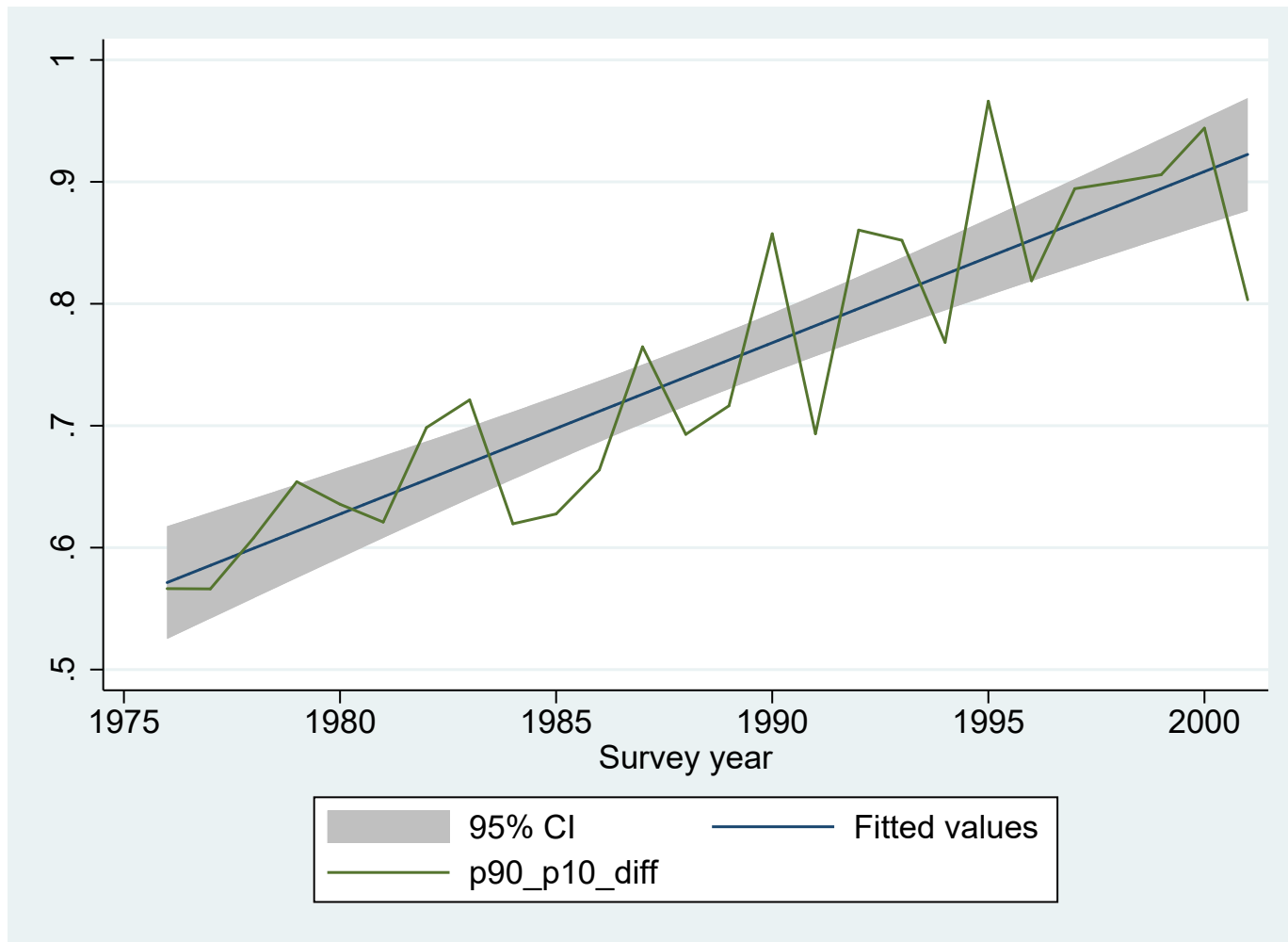


2. Per-capita income

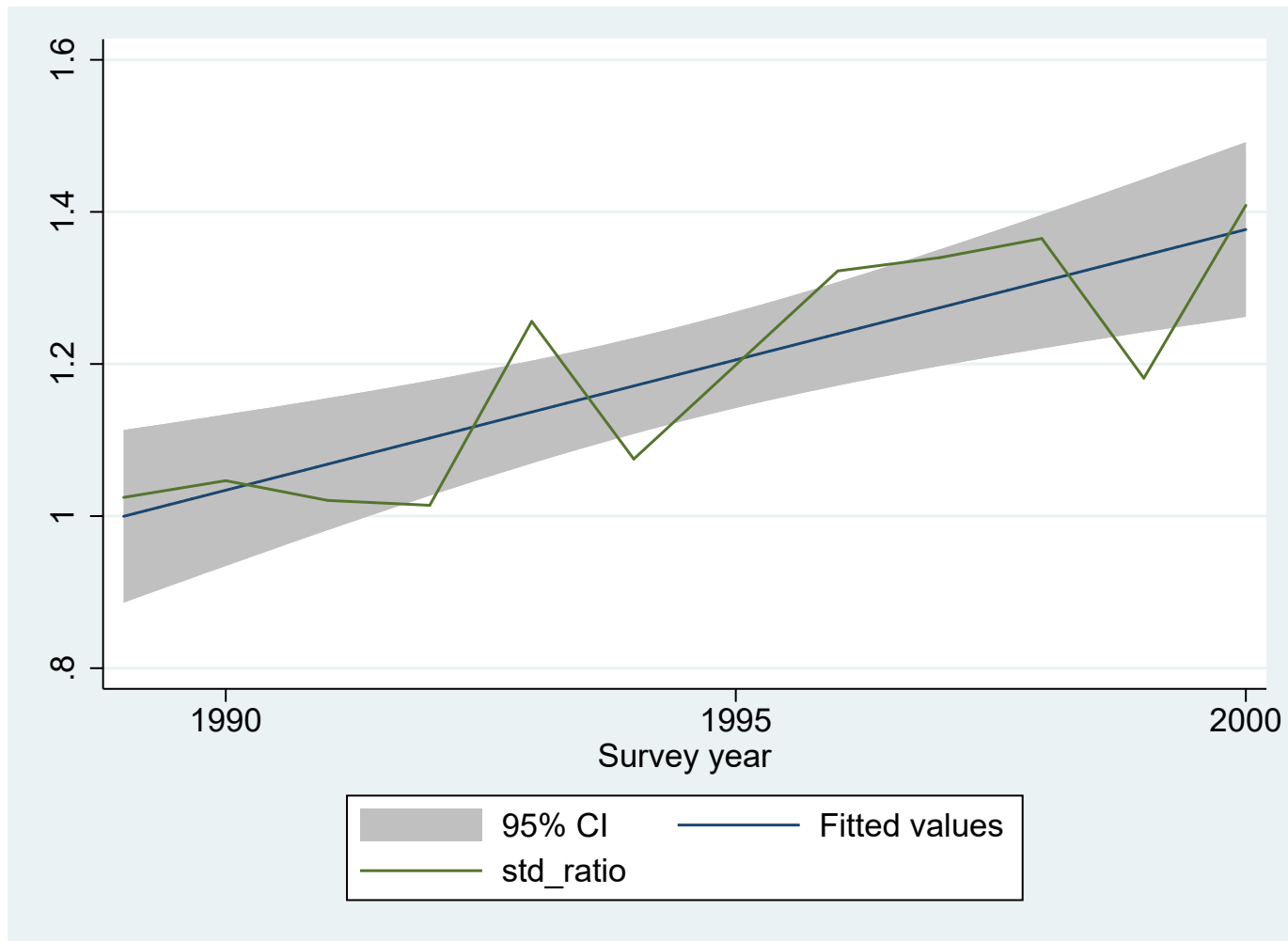
(Median in finance over median in non-finance)



3. Income inequality (P80/P20 in finance over P80/P20 in non-finance)



4. Idiosyncratic income volatility (Std growth in finance over std in non-finance)



CONCLUSION

- Partnerships may have lower contractual frictions than public companies because there is no separation between ownership and management.
- However, the greater 'internal' efficiency of partnerships reduces 'external' competition for managerial talents which, in equilibrium, lowers turnover.
- Lower turnover increases mis-matching and reduces the incentive to engage in activities that enhance human capital.
- An industry where the prevalent organizational form changes from partnerships to public companies experiences higher turnover, (labor) productivity and income inequality within the industry.

Compensation affects probability of external offers

- Vacancies are targeted at A_t and h_t but not Q_t^s .
- However, by lowering Q_t^s , the firm may attract external offers.
- As an extension we allow ρ to depend on individual Q_t^s .

Equilibrium properties

	<i>Partnerships</i>	<i>Public companies</i>
Probability of matching when unemployed	0.505	0.501
Probability external offer	0.069	0.229
Job separation	0.069	0.092
Average matching quality	0.057	0.061
Per-capita human capital	4.000	5.057
Growth human capital (average)	0.016	0.017
Growth human capital (standard deviation)	0.021	0.024
Gini index for human capital	0.597	0.664
Share of human capital top 5%	0.460	0.534
Share of human capital top 1%	0.289	0.361
Share of human capital top 0.1%	0.129	0.178
Utility value unemployed manager	-65.880	-67.173
Utility value new match unemployed manager	-59.346	-60.744
Firm value new match with unemployed manager	0.142	0.141