Drivers of Effort : Evidence from Employee Absenteeism

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Motivation

- Employee Effort is crucial for firm productivity.
- Practices to encourage employee effort are widespread. Examples of policies:
  - Incentive pay
  - Other human resource practices: TQM, benchmarking, profit sharing with all employees, employee participation in decision making
- These practices are widespread:
  - In the 1990s, 45% of salaried workers in the U.S. had some type of performance pay (Lemieux, McCleod, and Parent, 2009)
  - Black and Lynch (2001) find that other human resource practices are also very common among a representative sample of U.S. firms
- There is scant evidence comparing employee effort across a representative sample of firms
  - "The future of the field may be to move away from purely single firm studies to consider a larger number of firms…"(Bloom and Van Reenen, 2011)

This paper

1. Is there variation across firms in the average level of employee "effort"?

2. Is this variation driven by the type of employees who choose to work in each firm or by the incentives provided by the firm?

3. What firm features are important for employee effort provision?
   - This is the finance question

4. Do policies have heterogeneous effect effects on different group of employees? (senior managers vs workers)

This paper

- Measure of individual performance: Absenteeism
  - Pros:
    - Can be consistently computed for all employees in all occupations for a large number of firms in a developed economy
    - Because it is measured at the individual (and not firm) level, can identify firm effect by following movers
  - Cons:
    - Not productivity
    - It is only one dimension of effort

Overview of Results

- Show large differences in average absenteeism across firms
  - The difference between firms in the top and bottom decile is 15 days.
  - This variation persists even within industry.

- Using movers we analyze the role played by two broad set of explanations for this difference:
  - *"Incentives" vs "Selection"*
  - *53% of the difference in average days absent is driven by "incentives".*
  - Results are robust using only absences around national holidays and weekends

- What firm characteristics matter: *Career considerations, firm organizational structure, market forces, ownership and control*

Contribution to Literature

Our paper adds to the large literature on the effects of incentives on employees.

Two typical types of studies:

1. Single policy, single firm studies with individual level productivity
   - Example: fixed wages to piece rates
     - Lazear (2000): Windshield installers in Safelite Glass Company
     - Bandiera et al. (2007): Managers in a U.K. fruit farm
     - Freeman and Kleiner (2005): Workers in a U.S. shoe manufacturer
     - Shearer (2004): Tree planters in British Columbia

2. Multiple firms and firm level productivity
   - Some studies on the associations of policies and firm level productivity (endogeneity issues)
   - RCT in developing countries
     - Karlan and Valdivia (2009), Bruhn et. al. (2010), Bloom et al. (2010)

Contribution to Literature

→ Know little about the effectiveness of these tools in a representative firm in a developed economy

→ Ichino & Maggi (2000) examine shirking differentials in a large Italian bank. Since it is one firm they do not have variation in firm characteristics.

- Our paper focus on movers – change in behavior around move
  - Movers are affected by a different set of firm policies (origin vs destination)
  - As opposed to previous literature, does not require to find changes in firm policies
    - Easier to identify movers than firm policy changes
    - Sidesteps the issue of endogenous policy change – although now need to think about endogeneity of moves

Data

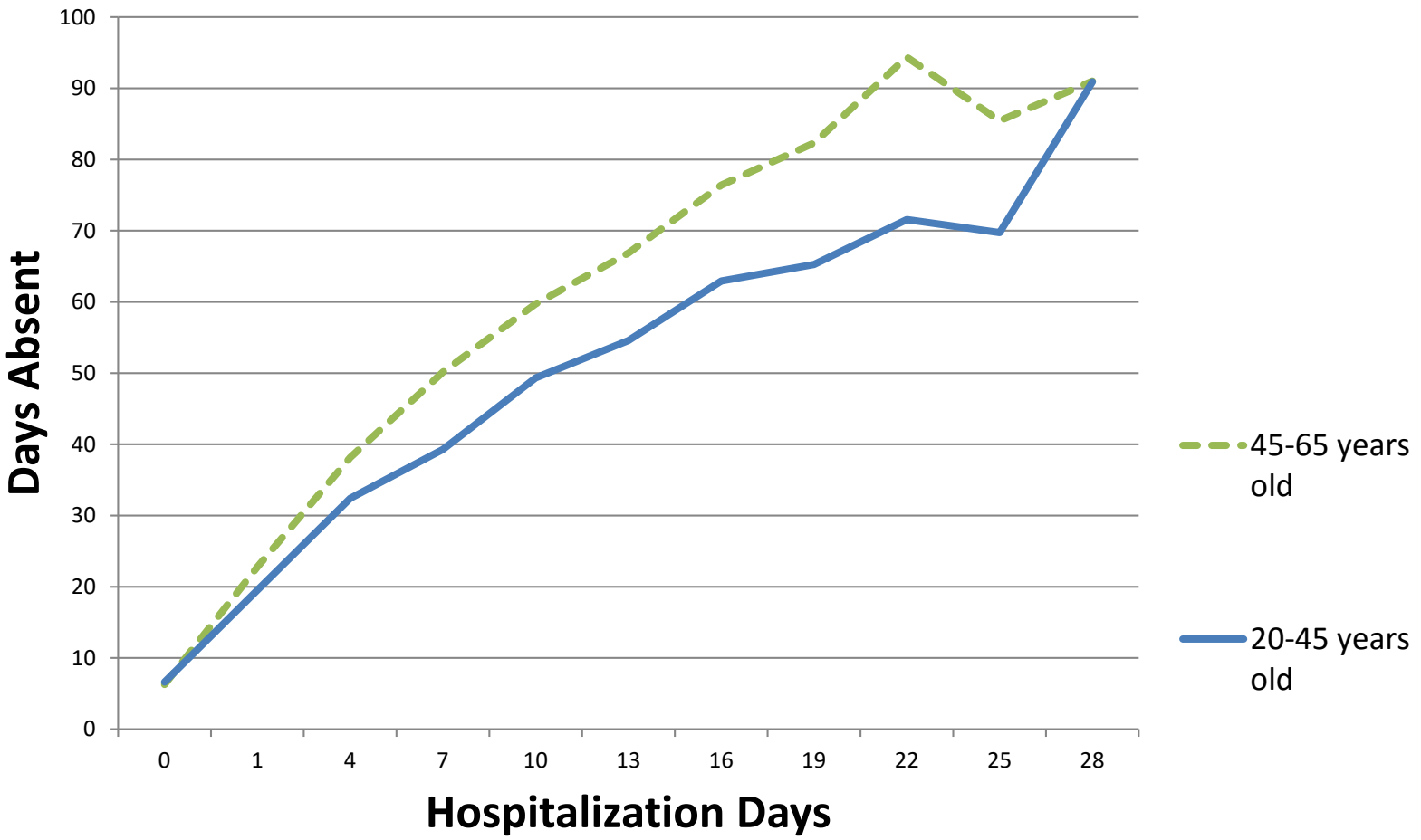
Data Sources – Days Absent

- **Survey on Employee Absence by Statistics Denmark**
  - Individual data on employee absences: (a) own sickness, (b) child sickness, (c) accident at the workplace.
  - For the private sector absence data are gathered by Statistics Denmark for a sample of 2,600 companies.
  - It includes: all firms with more than 250 employees and a sample of firms with 10-250 employees
  - Includes every spell of absence for each employee
  - We focus on full-time employees
  - Years: 2007-2012

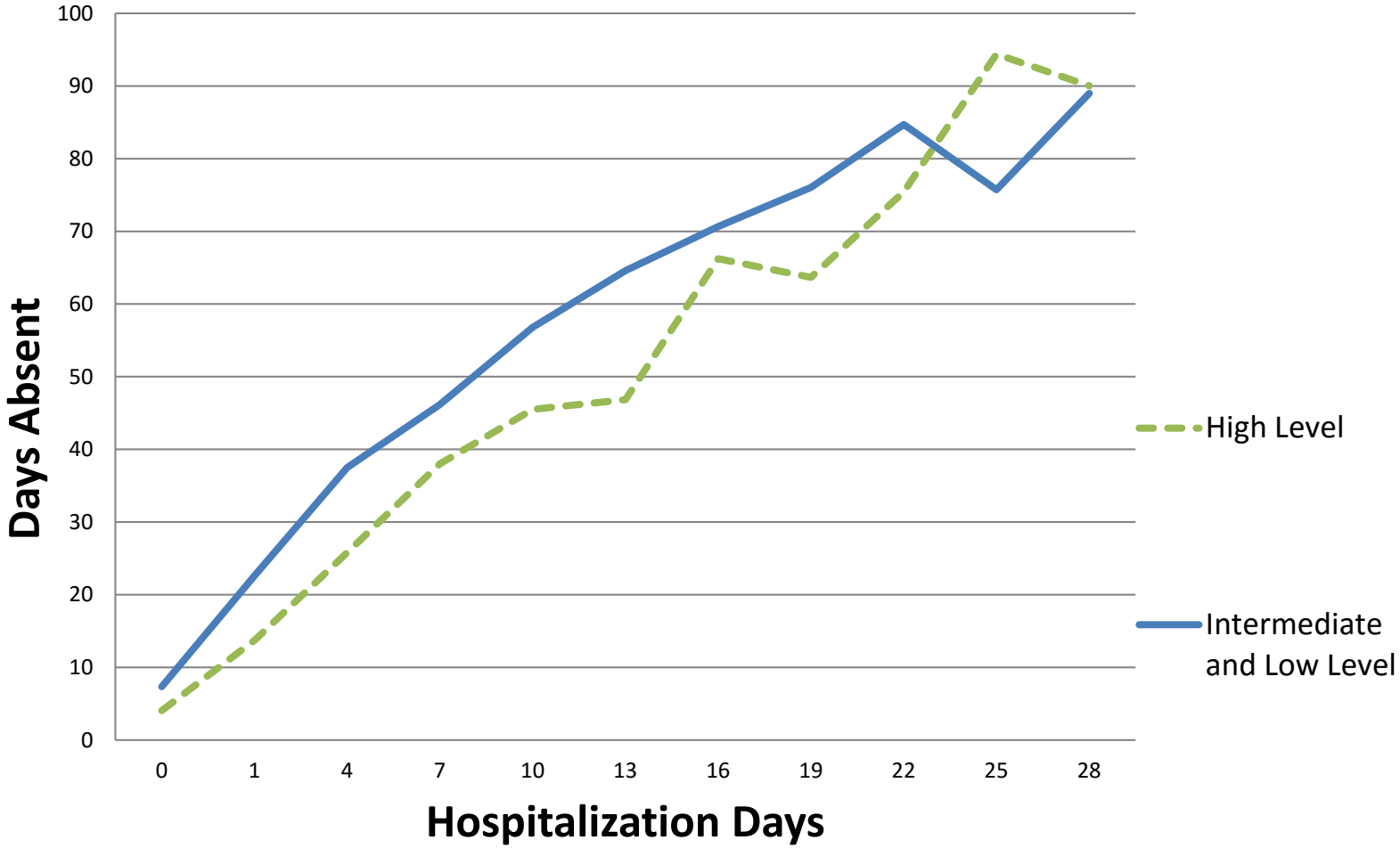
Days Absent: Description and Institutional Details

- Employers have a strong incentive to report
  - Firm is required to pay sickness benefits for the first 30 days of sickness
  - Danish Government pays after this initial period
- Easy to report
  - Statistics Denmark developed software that links to firm's payroll system
- Measure of sick days –not vacation time
  - All employees have the right to 5 weeks (25 days) of holidays every year
  - Any adjustments are negotiated with the unions of specific industries and not at the firm level

Days absent: does it contain information?



Absent days: is it discretionary?



We will also use absent spells that start on Monday or Friday and spells that start around 2 days of a national holiday

Other Data Sources

- ***Matched employee-employer data (IDA)***
  - Employer ID, employee's position in firm and wage
  - Employee Demographics: Age, gender, education
- ***Hospitalization data from National Patient Registry***
  - Number of days every person spends at the hospital
- ***Financial and management data are from Experian***
  - Audited financial statements
  - Name of all managers and CEOs

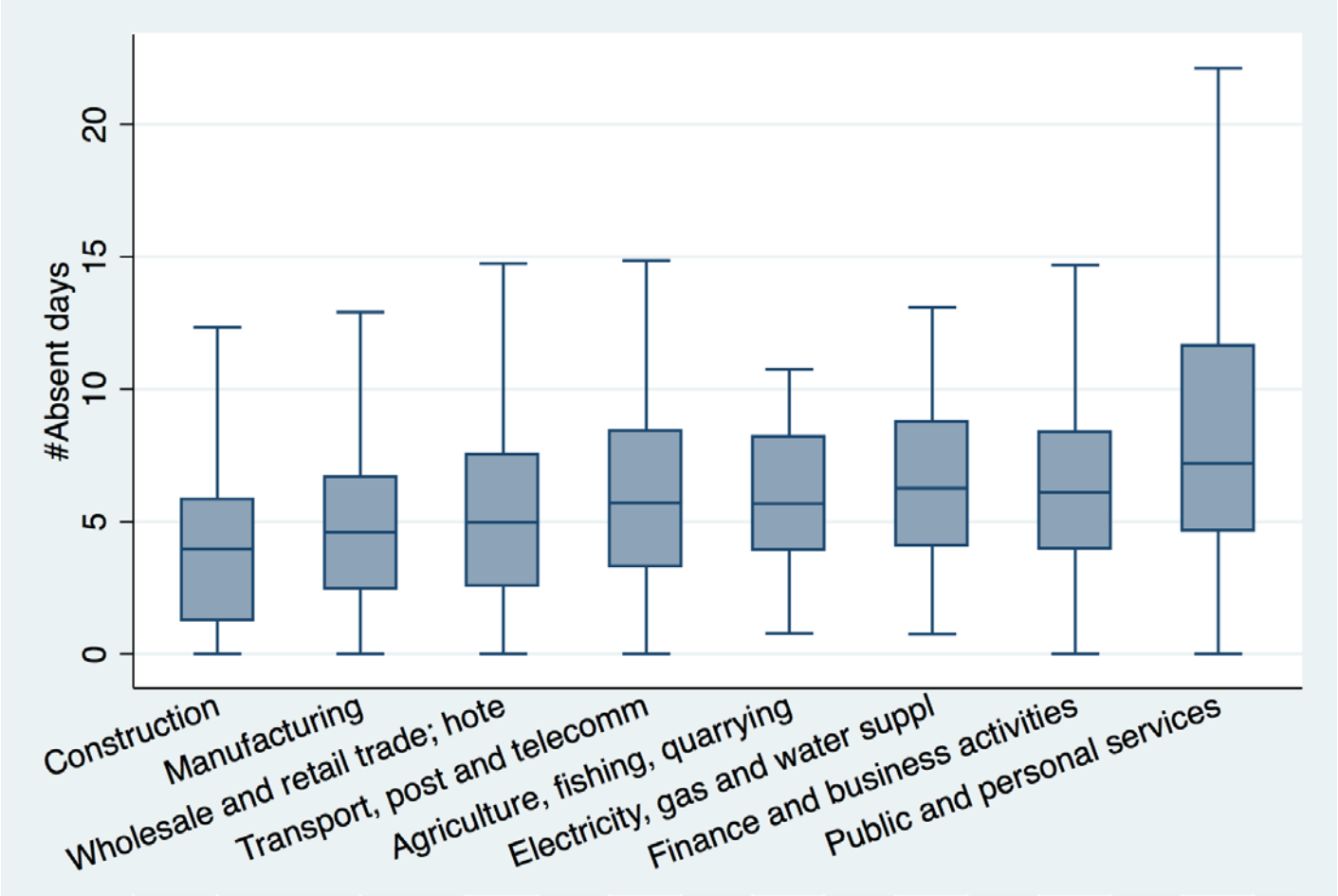
Variation in firm level absenteeism

Our measure at the firm level: $\bar{y}_j = \sum_t \frac{1}{N_{jt}} \sum_{i:J(i,t)=j} y_{it}$

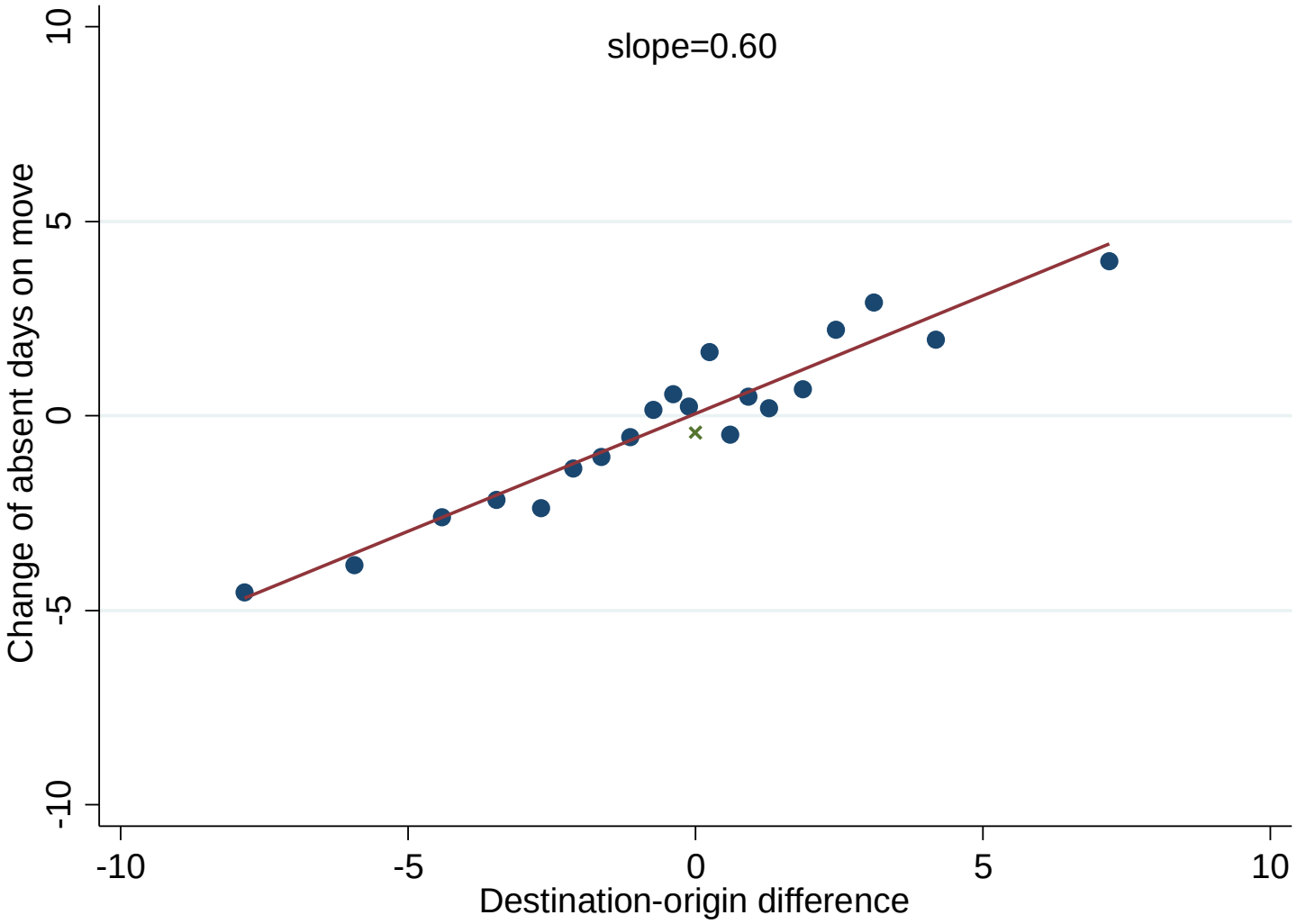
- *There are large differences in days absent across firms*

	Above/below Median	Top/bottom 25%	Top/bottom 10%	Top/bottom 5%
	(1)	(2)	(3)	(4)
Difference in days absent:	**6.288**	**10.353**	**15.656**	**20.046**

Variation in firm level absenteeism



Change in Days Absent by Size of Move



Difference in absence between destination and origin firm

Results

Decomposition into individual and firm components

- Model for employee days absent

$$y_{it} = \alpha_i + \beta x_{it} + \gamma_{J(i,t)} + \mu_t + e_{it}$$

- $\alpha_i + \beta x_{it}$ is the portable component of employee behavior
  - α_i captures time-invariant characteristics motivation, discipline, sense of responsibility …
  - βx_{it} captures effect of no. children, health status, wage etc

- $\gamma_{J(i,t)}$ captures the effect of the firm on all its employees
  - These firm fixed effect are the main focus of the paper
  - At a later stage we will try to "explain" these γ's as a function of firm characteristics

- Need <u>movers</u> to separately identify firm and firm fixed effects

Contribution of "incentives" to average firm days absent

- The shares of the difference in average absenteeism between firm j and firm j' accounted for by "incentives" are:

$$S_{firm} = \frac{\gamma_j - \gamma_{j'}}{\bar{y}_j - \bar{y}_{j'}}$$

Decomposition of Absence Gap

	Above/below Median	Top/bottom 25%	Top/bottom 10%	Top/bottom 5%
	(1)	(2)	(3)	(4)
Difference in days absent:				
Overall	6.288	10.353	15.656	20.046
Due to "incentives"	3.361	5.958	9.416	12.979
Due to "selection"	2.926	4.395	6.240	7.067
Share of difference Due to "incentives"	0.534	0.575	0.601	0.648
	(0.058)	(0.051)	(0.079)	(0.097)
Due to "selection"	0.466	0.424	0.398	0.352

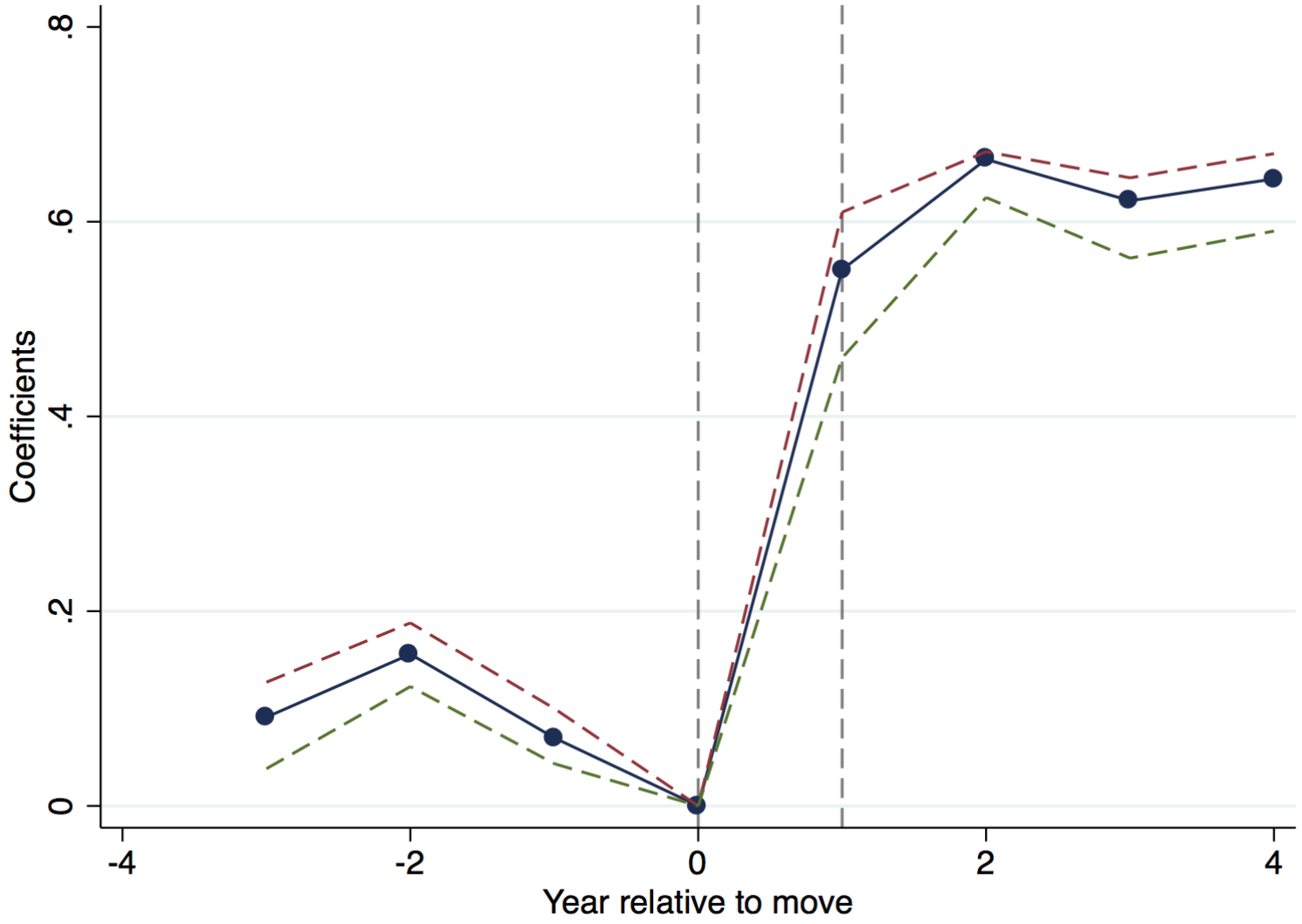
Obtained similar results when used absence spells that started on Monday, Friday and around a holiday

Exogenous mobility

- Time-varying component of employee behavior
  - Example:
    - Change in motivation
  - Concern:
    - People with increase in motivation move to firms with low absenteeism
    - Estimation overstates firm fixed effects

- Match-component of employee behavior
  - Example:
    - Specific firm-employee ”fit”
  - Concern:
    - Employees move to firm where fit is best

Event Study of Movers



So far ...

- Large variation in days absent
- Our results show that 53-64% of the variation across firms in can be attributed to workplace environment
- What firm characteristics correlate (explain) with these firm effects?

Explaining the firm fixed effects

- We run the following cross-sectional regression

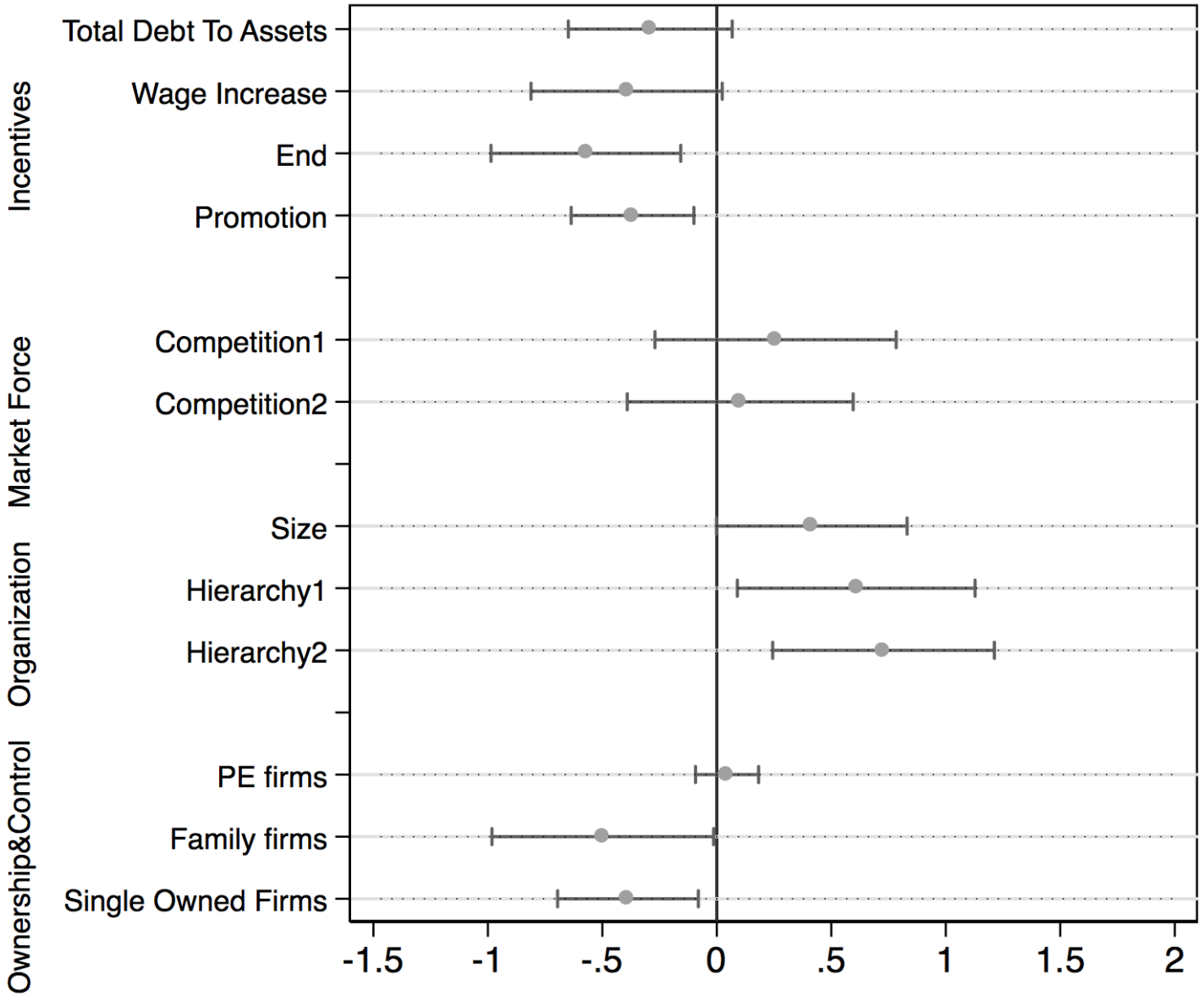
$$\gamma_j = \delta z_j + \varepsilon_j$$

where z are firm characteristics

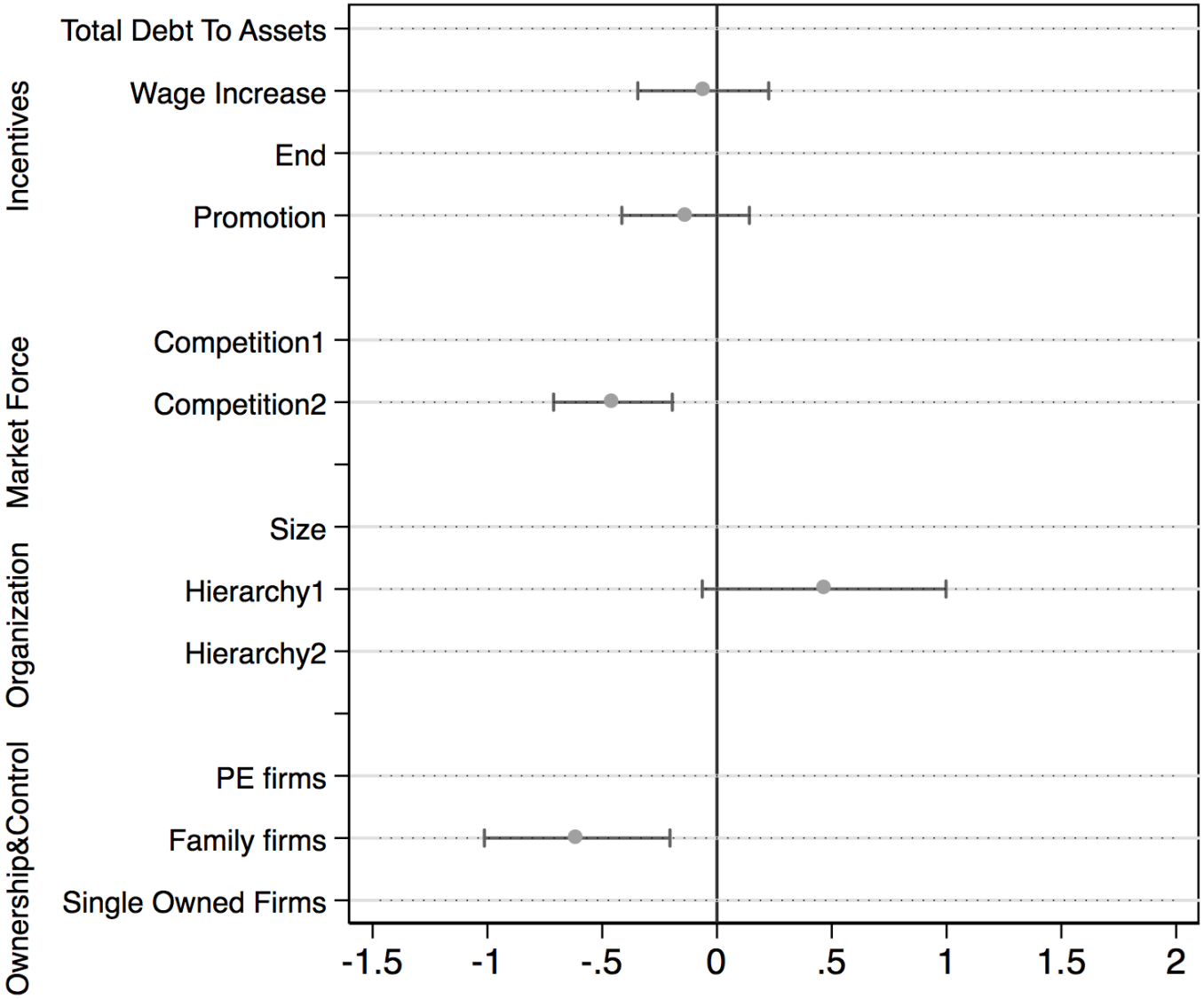
- Note results are not driven by employee selection but we do not have exogenous variation in z

- We standarize the covariates to have mean of zero and sd of 1

Observable correlates of fixed effects



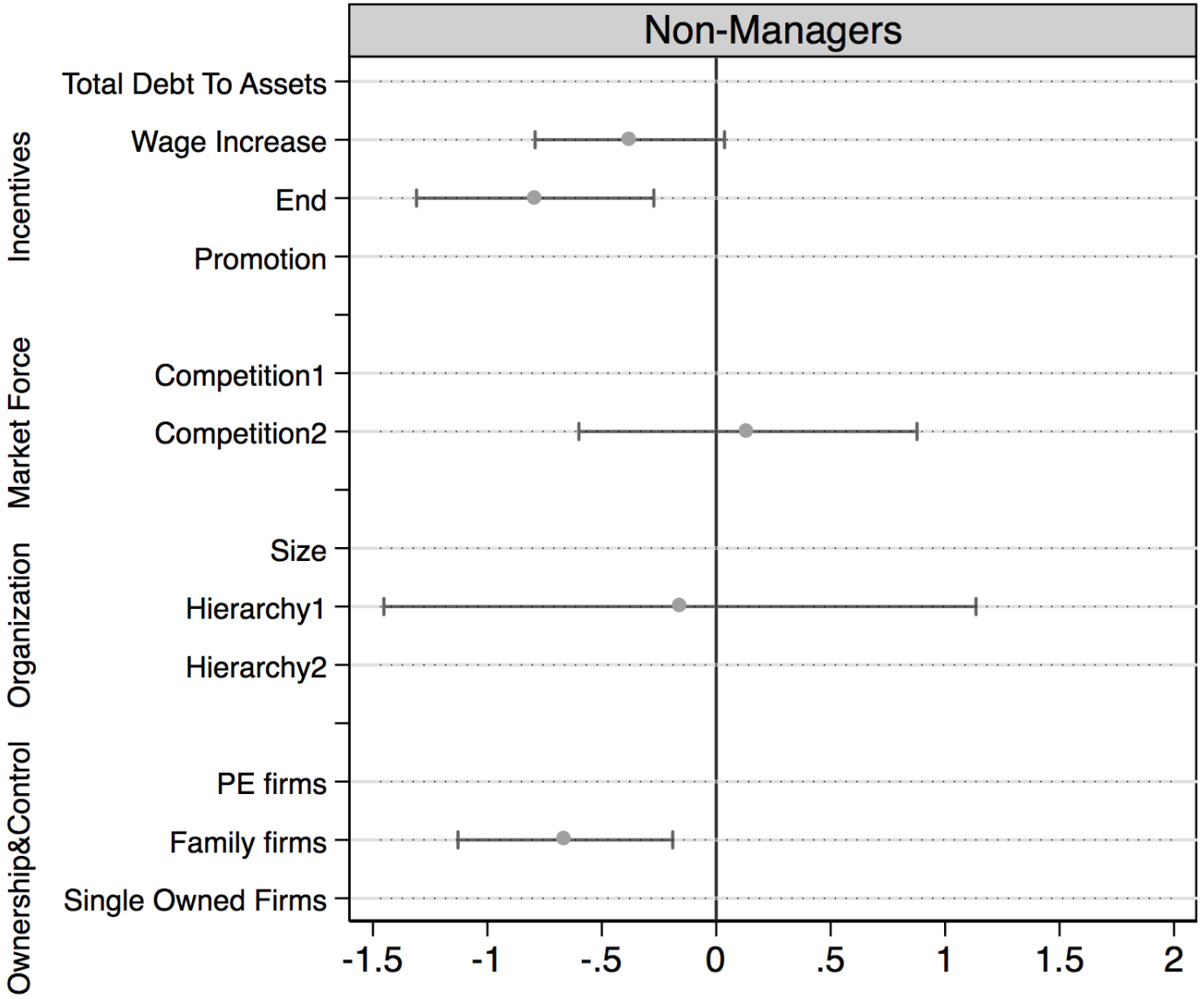
Post-Lasso


Total Debt To Assets
Wage Increase
End
Promotion
Competition1
Competition2
Size
Hierarchy1
Hierarchy2
PE firms
Family firms
Single Owned Firms
Incentives
Market Force
Organization
Ownership&Control
-1.5
-1
-.5
0
.5
1
1.5
2

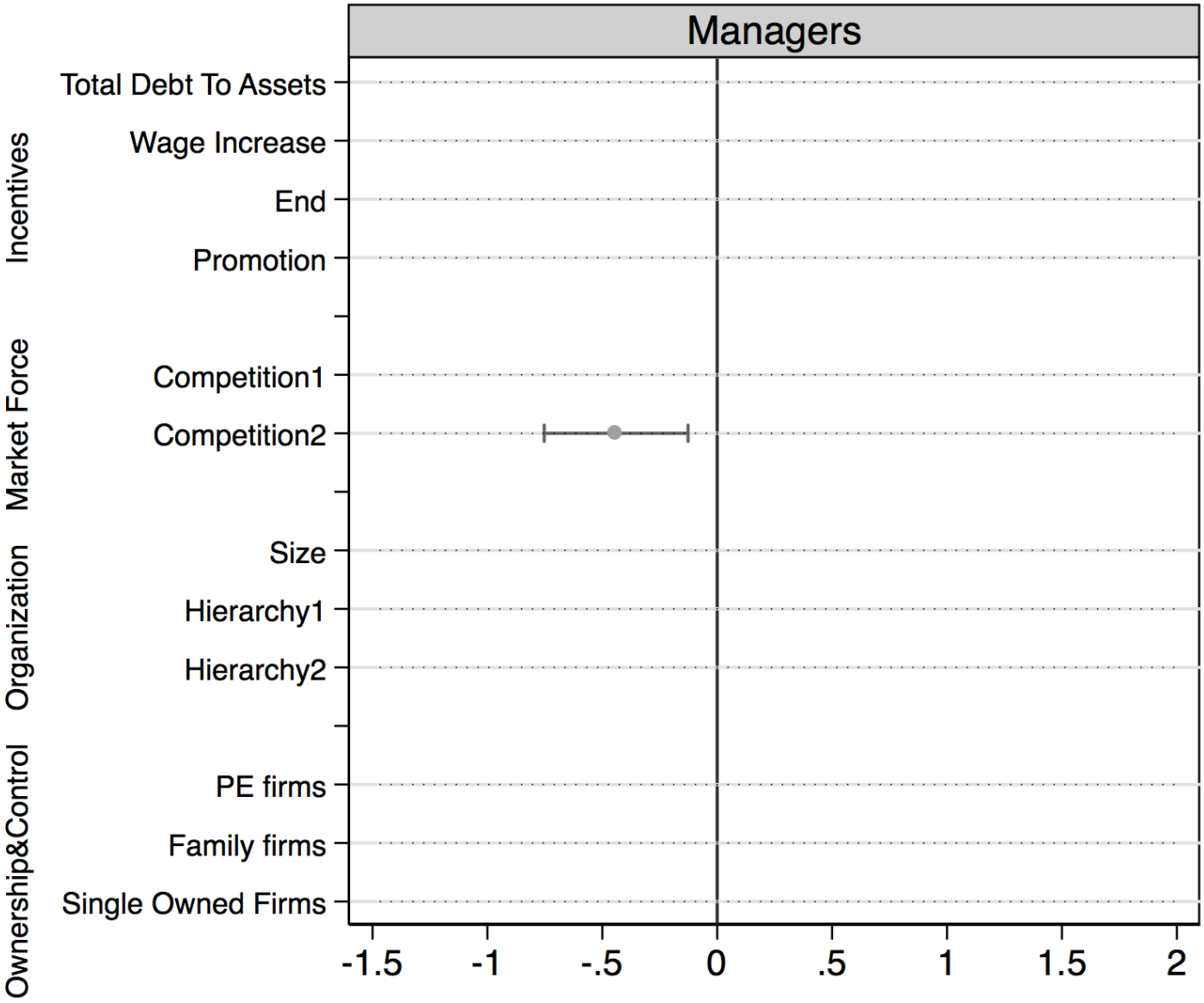
Firm fixed effects for different types of employees

- We classify employees into 2 groups: managers and workers
- We estimate the model separately on these two groups

Post-Lasso; Non-Managers



Post-Lasso; Managers



Conclusion

- We use employee level absenteeism and identify firm effects based on movers
- We find that 53-63% of the variation in firm average days absent is due to ”work environment”
- We find the firm effect to be correlated with
  - Career Considerations
  - Family firm status/ownership concentration, specially for non-managers
  - Competition, specially for managers

Summary Statistics Firms

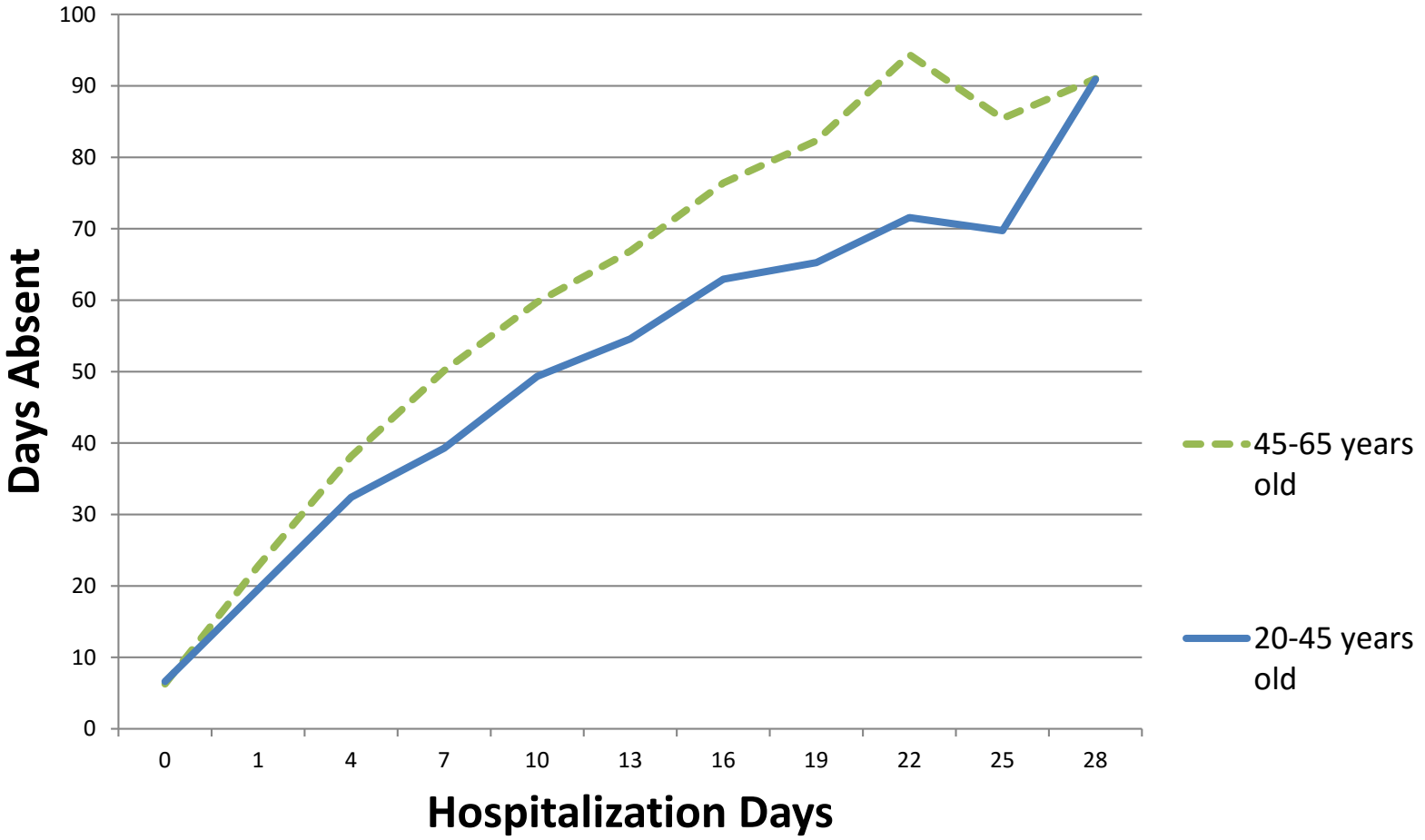
	All	All -sample firms	Diff Sample vs All
OROA	0.0757	0.0599	-0.0267***
	(0.0007)	(0.0025)	(0.0026)
	[257,397]	[7,678]	[257,397]
Net Income/assets	0.0433	0.0349	-0.0087***
	(0.0005)	(0.0022)	(0.0023)
	[257,392]	[7,673]	[257,392]
Assets	51.8463	364.1203	321.9191***
	(0.8400)	(9.7585)	(9.7870)
	[257,432]	[7,713]	[257,432]
Ln(Assets)	2.8465	4.9601	2.1789***
	(0.0082)	(0.0340)	(0.0349)
	[257,431]	[7,712]	[257,431]
No. of employees	38.5082	179.0560	145.0036***
	(0.3553)	(3.5823)	(3.5965)
	[257,636]	[7,917]	[257,636]
Firm age	22.9027	35.0215	12.5025***
	(0.1416)	(0.5679)	(0.5860)
	[256,356]	[7,867]	[256,356]

- *Sample firms are larger and older than average firm in Denmark*

Summary Statistics Employees

	All	All -sample firms	Diff Sample vs All
Employee wage	306,750 (3143.6150)	425,184 (8458.332)	147,087*** (8864.1990)
Employee age	38.5200 (.1747)	41.1428 (.2802)	3.2780*** (.3381)
Male	0.6625 (.0041)	0.6207 (.0089)	-0.0523*** (.0100)
Hospitalization Days	0.2512 (.0017)	0.2095 (.0038)	-.0520*** (.0042)
Sickness Absence		7.6321 (.3042)	
No. of Children	1.3843 (.0093)	1.2647 (.0170)	-.1488*** (.0200)

Days absent: does it contain information?



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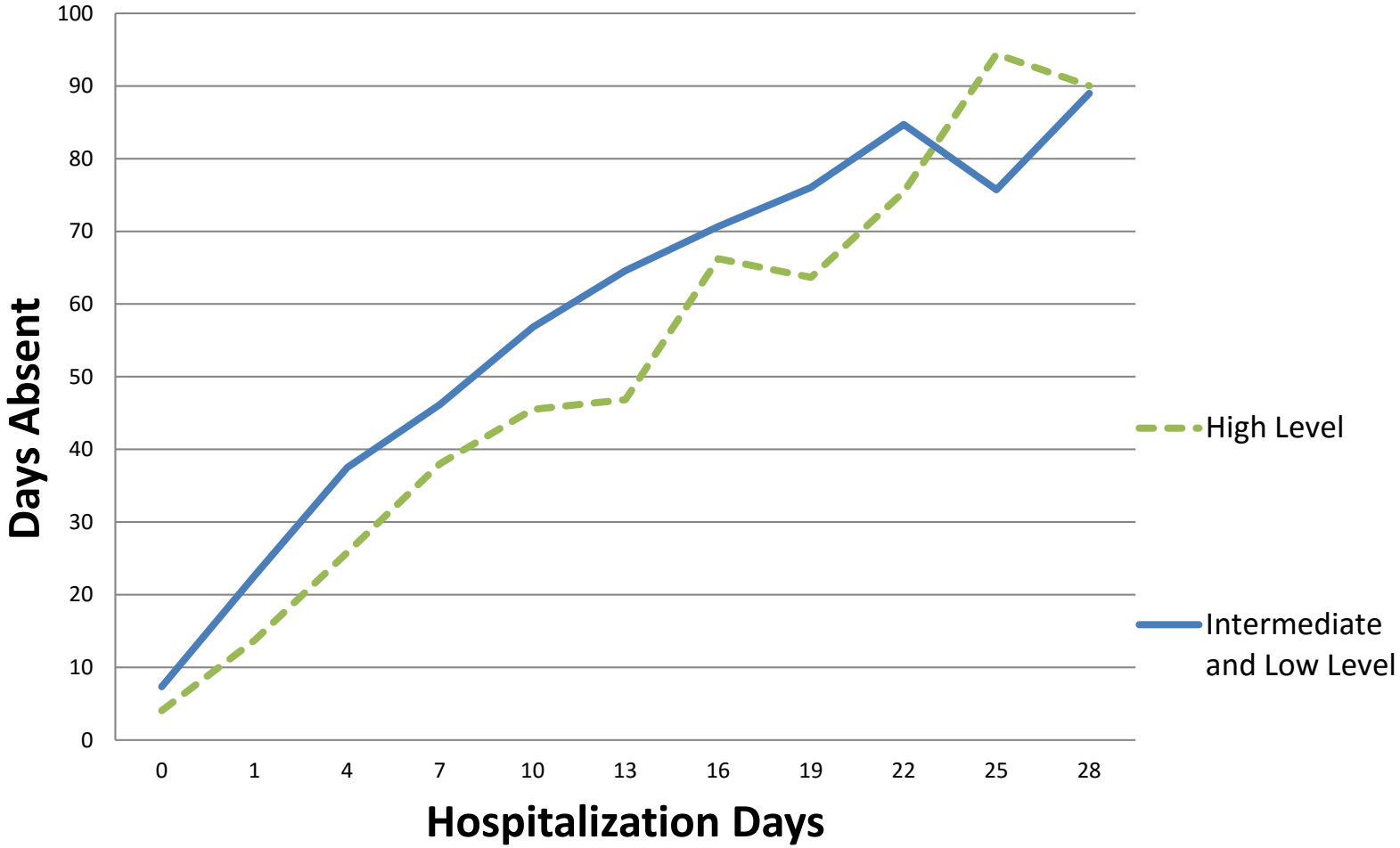

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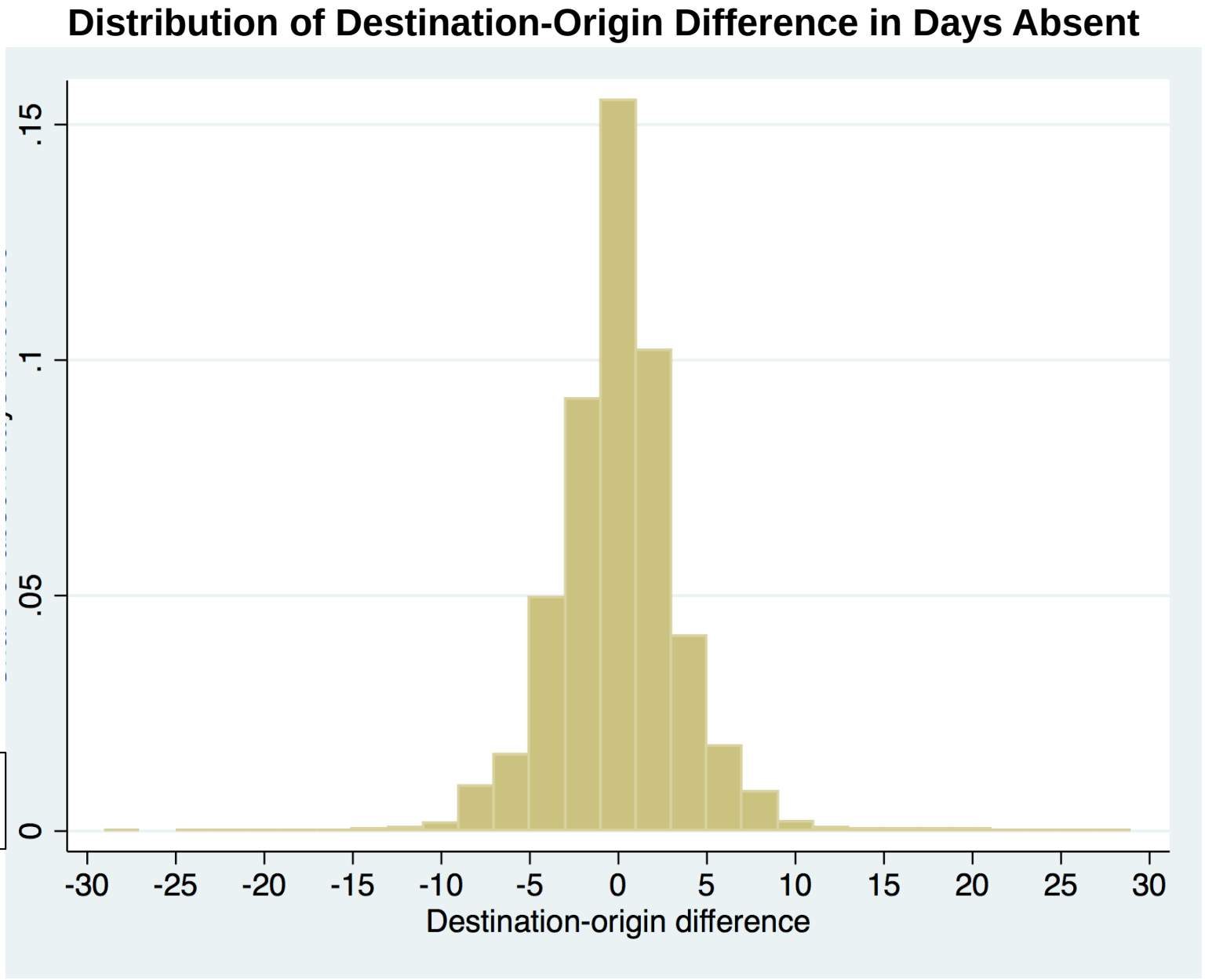
Days absent: does it matter for the firm?

Dependent Variable: Performance (OROA)	Less than 100 Employees	More than 100 Employees	More than 300 Employees
	(1)	(2)	(3)
Days Absent	**0.0000**	**-0.0008****	**-0.0011***
	(0.0007)	**(0.0004)**	**(0.0006)**
Firm Age	-0.0079***	-0.0079***	-0.0065***
	(0.0030)	(0.0015)	(0.0020)
Firm Assets	0.0004	-0.0000	-0.0000
	(0.0029)	(0.0000)	(0.0000)
Constant	0.3120***	0.3740***	0.3228***
	(0.0935)	(0.0586)	(0.0815)
Observations	3,499	4,078	1,932
R-squared	0.8058	0.7127	0.7035
Year FE	Yes	Yes	Yes
Firm Controls	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
No.firms	1,652	1,236	550

Movers



Mean=0.06
SD=3.87

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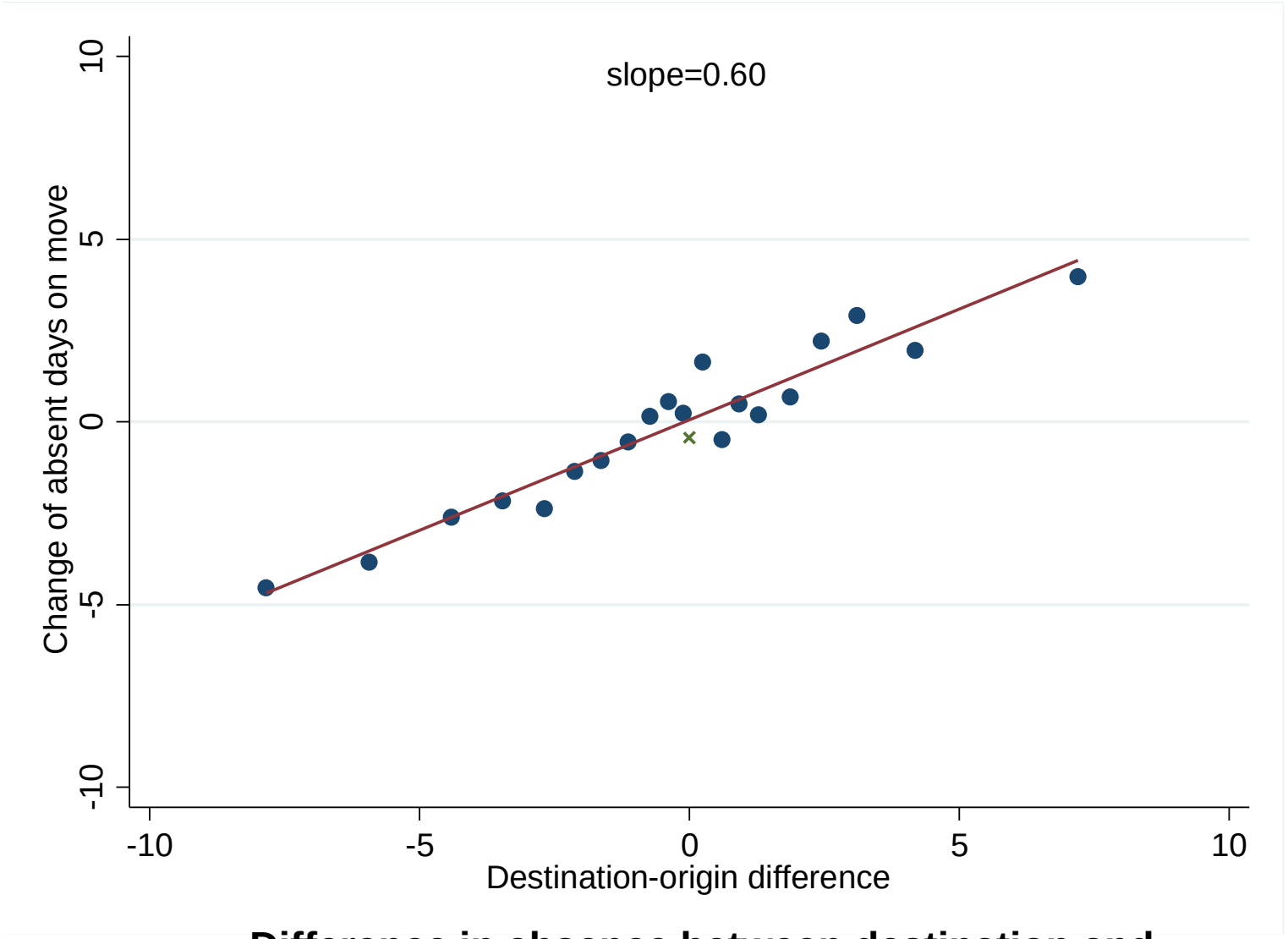
Variation in firm level absenteeism

- The differences are there even if we look within industries

	Above/below Median	Top/bottom 25%	Top/bottom 10%	Top/bottom 5%
	(1)	(2)	(3)	(4)
Difference in absence:				
Manufacturing	5.453	8.894	13.455	17.729
Construction	6.206	10.03	15.225	20.277
Retail, Hotels & Restaurants	6.280	10.089	14.689	18.391
Transportation & Telecommunication	6.473	10.749	16.751	23.007
Finance and Insurance	6.734	11.260	18.514	26.554
Education and Healthcare	10.701	18.099	29.638	41.286

Change in Days Absent by Size of Move



Difference in absence between destination and origin firm

Event study

- If we focus only on movers that move only once from origin firm o(i) to destination firm d(i), we can re-write

$$y_{it} = \alpha_i + \beta x_{it} + \gamma_{J(i,t)} + \mu_t + e_{it}$$

as

$$y_{it} = \alpha_i + \beta x_{it} + \gamma_{o(i)} + \mathbb{I}(t > Ti)\underbrace{\frac{\gamma_{d(i)} - \gamma_{o(i)}}{\bar{y}_{d(i)} - \bar{y}_{o(i)}}}_{S_{firm}}(\bar{y}_{d(i)} - \bar{y}_{o(i)}) + \mu_t + e_{it}$$

We estimate

$$y_{it} = \tilde{\alpha}_i + \beta x_{it} + \theta \mathbb{I}(t > Ti)\,(\bar{y}_{d(i)} - \bar{y}_{o(i)}) + \mu_t + e_{it}$$