



## **Financial Econometrics – Cross Section and Panel Data**

**Discussion of “Do CEOs Matter? Evidence from  
Hospitalization Events” by Bennedsen et al., JF 2020**

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## Reminder from last time



- I suggest that you write notes for yourself that cover the following:
  - What is/are the economic question(s) the paper is trying to answer? What is the paper's "unique selling point" (USP), i.e. how does it move the literature forward?
  - What is the empirical approach? Potential endogeneity issues & how does the paper address them?
  - Data used & main results? Economic interpretation?
  - What do you like about the paper?
  - What could be improved / wasn't clear to you?

Try to link in particular to things we discussed in the lectures. Also think about the way results are communicated (tables/figures/writing).

# Economic question and the paper's USP



- 
- “Do CEOs matter?” – if the CEO is absent, how does that affect firm performance?
  - USP: data that links CEO absences that are likely exogenous (due to hospital stays) to firm performance
    - detailed info on medical conditions helps refine analysis
    - more common than CEO deaths studied in other papers
  - Can control for firm X CEO fixed effects, rather than just firm FE or CEO FE
    - Why does it matter?

Other studies not able to rule out “firm demand” effects as drivers (see pp. 1880; 1891/92)

# Empirical approach and potential endogeneity issues

- Basic analysis very straightforward – descriptive statistics, figures and simple two-way fixed effects regressions

**Table III**  
**Number of Days of Hospital Stay and Firm Performance: Means and Medians**

This table presents average performance measures as a function of the number of days that a firm's CEO stayed in the hospital in a given year (Panel A), differences in means (Panel B), and results from quantile (median) regressions (Panel C). Performance measures include: (a) OROA: operating return on assets (column (1)), the ratio of operating income to total assets, (b) Industry-adjusted OROA (column (2)): the difference between a firm's OROA and the average of its four-digit NACE (European industry classification system) industry benchmark, (c) NI/Assets (column (3)): net income over assets, and (d) Ind. Adj. NI/Assets (column (4)): Industry-adjusted net income over assets, the difference between a firm's net income to assets ratio and the average of its four-digit NACE benchmark. Industry averages are calculated using firm-year observations in which a CEO was not hospitalized. Hospital days data are constructed based on hospitalization records from Statistics Denmark, which reports the number of days that an individual was hospitalized and reported as sick in a year. Standard errors are in parentheses. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, respectively.

		OROA	Ind. Adj. OROA	NI/Assets	Ind. Adj. NI/Assets
Firm-Years		(1)	(2)	(3)	(4)
<b>Panel A: By Length of Hospital Stay</b>					
All firm-years	133,219	0.0856 (0.0008)	0.0000 (0.0008)	0.0517 (0.0007)	0.0000 (0.0007)
0 days	123,855	0.0862 (0.0008)	0.0006 (0.0008)	0.0522 (0.0007)	0.0005 (0.0007)
1 day	3,648	0.0802 (0.0028)	-0.0046 (0.0027)	0.0486 (0.0024)	-0.0028 (0.0023)
2 to 4 days	2,770	0.0807 (0.0030)	-0.0044 (0.0029)	0.0476 (0.0026)	-0.0037 (0.0025)
5 to 9 days	1,535	0.0701 (0.0038)	-0.0150 (0.0037)	0.0370 (0.0032)	-0.0143 (0.0031)
10 to 19 days	866	0.0764 (0.0049)	-0.0105 (0.0047)	0.0458 (0.0043)	-0.0067 (0.0042)
At least 20 days	545	0.0632 (0.0069)	-0.0247 (0.0069)	0.0310 (0.0059)	-0.0226 (0.0059)
0 to 4 days, all firms	129,711	0.0859 (0.0008)	0.0003 (0.0008)	0.0520 (0.0007)	0.0003 (0.0007)
0 to 4 days, event firms	60,822	0.086697 (0.0012)	0.000908 (0.0012)	0.052817 (0.0010)	0.001052 (0.0010)
At least 5 days	2,946	0.0707 (0.0030)	-0.0155 (0.0029)	0.0385 (0.0025)	-0.0136 (0.0025)

**Panel B: Differences in Means**

1 vs. 0 days	-0.0060** (0.0027)	-0.0052* (0.0027)	-0.0036 (0.0023)	-0.0033 (0.0023)
At least 5 vs. 0 to 4 days	-0.0153*** (0.0029)	-0.0158*** (0.0029)	-0.0135*** (0.0025)	-0.0139*** (0.0025)
At least 5 vs. 0 to 4 days, event firms	-0.0160*** (0.0029)	-0.0164*** (0.0028)	-0.0144*** (0.0025)	-0.0146*** (0.0024)

**Panel C: Median Analysis**

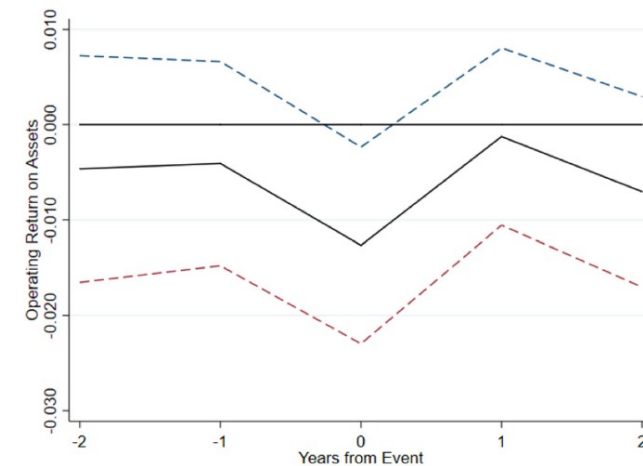
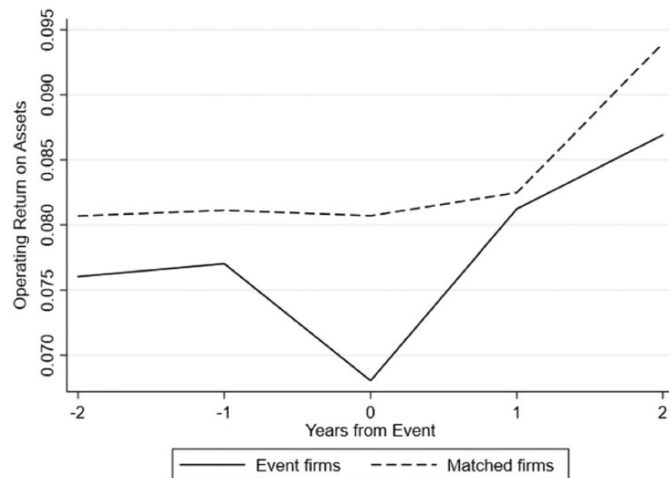
1 vs 0 days, median	-0.0004 (0.0018)	-0.0016 (0.0018)	0.0001 (0.0015)	-0.0001 (0.0015)
At least 5 vs. 0 to 4 days, median	-0.0103*** (0.0020)	-0.0126*** (0.0020)	-0.0086*** (0.0017)	-0.0087*** (0.0017)
At least 5 vs. 0 to 4 days, median, event firms	-0.0108*** (0.0021)	-0.0131*** (0.0020)	-0.0088*** (0.0017)	0.0089*** (0.0016)

(Median analysis often useful to show that differences not driven by outliers)

Question: is this table the most effective way to communicate?

# Empirical approach and potential endogeneity issues

- Graphical illustration of main effect:



**Figure 1. OROA for event and matched samples.** This figure plots the average operating return on assets (OROA), defined as operating income over book value of assets, for event firms and a sample of matched firms. Event firms are defined as those with a CEO hospitalization of at least five days. We match each event firm with a nonevent firm in the same industry that is in the same industry quintile the year prior to the hospitalization in terms of OROA, age, and assets.

**Figure 2. Difference in OROA between event and matched firms.** This figure plots the difference in average operating return on assets (OROA) between event firms and matched firms. The dashed lines represent 95% confidence intervals. Event firms are defined as those with a CEO hospitalization of at least five days. We match each event firm with a nonevent firm in the same industry that is in the same industry quintile the year prior to the hospitalization in terms of OROA, age, and assets. (Color figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com))

Thoughts on figures & matching?

# Empirical approach and potential endogeneity issues



- Main regression table: Table IV

	OROA	OROA	OROA	OROA	OROA	Income/Assets
	(1)	(2)	(3)	(4)	(5)	(6)
N. days at hospital, $t$	-0.00059*** (0.00012)	-0.00050*** (0.00011)	-0.00050*** (0.00011)	-0.00050*** (0.00011)		-0.00037*** (0.00009)
N. days at hospital, $t-1$				-0.00016 (0.00010)		
N. days of hospital stay btw 1 and 4					-0.00240 (0.00174)	
N. days of hospital stay btw 5 and 9					-0.00617* (0.00325)	
N. days of hospital stay at or above 10					-0.00983*** (0.00352)	
Firm controls	No	Yes	Yes	Yes	Yes	Yes
Year FE	No	Yes	Yes	Yes	Yes	Yes
Firm/Firm-CEO FE	Firm	Firm	Firm-CEO	Firm-CEO	Firm-CEO	Firm-CEO
$R^2$	0.00030	0.05347	0.05574	0.05576	0.05564	0.04279
Number of firm-years	133,219	133,063	133,063	133,063	133,063	133,063

## Questions:

- What do we learn from each column (1)-(6)?
- What “firm controls” are used? Are they sufficient?
- What role do the fixed effects play? Are there too few / too many perhaps?
- How are the standard errors clustered & why?
- How could this table be improved?

# Empirical approach and potential endogeneity issues

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- What are the potential endogeneity issues associated with the previous results & how do authors address them?
    1. Maybe CEOs go to hospital because of firm's performance (e.g. stress related)? Or "time their stay" to low-performance times
      - show that *future* hospital stays not related to performance
      - use diagnoses that are clearly not stress related / serious enough that a CEO would not want to delay
    2. Length of hospital stay endogenous to how valuable the CEO's presence at work is
      - instrument for length of stay based on average length of stay by all patients

# Instrumental variable analysis



- Relevance condition?
- Exclusion restriction?
- Any comments on way results are presented & discussed?

Table V—Continued

Panel C: Does Firm Performance Cause Hospital Length?			
	All Conditions IV-2SLS	All Conditions IV-2SLS	All Conditions IV-2SLS
	(1)	(2)	(3)
N. days at hospital, $t$	-0.00167*** (0.00024)	-0.00092*** (0.00023)	
Stayed at hosp. 10 days or more, $t$			-0.03103*** (0.00812)
Firm controls	No	Yes	Yes
Year FE	No	Yes	Yes
Firm-CEO FE	Yes	Yes	Yes
IV-2SLS	Yes	Yes	Yes
$R^2$		0.05563	0.05156
Observations	133,097	132,941	133,097

# Heterogeneity analysis



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- Often, we try to learn about the “channels” behind an effect by testing how its strength varies across subsamples
    - CEO characteristics
    - Firm characteristics
    - Industry characteristics
  - Ways to do this:
    - separately estimate regressions across subsamples – here
    - use interaction terms
      - in both cases, researcher “pre-selects” cuts of interest
    - state-of-the-art: use machine learning to “let the data speak” (see e.g. Athey and Imbens, Annual Review of Economics 2019; Bryan, Karlan and Osman, AER 2024 for recent application)

# Heterogeneity analysis



Panel A: By CEO Characteristics

	CEO Tenure			CEO age		CEO Status as of 2012		CEO Education	
	Short (1)	Medium (2)	Long (3)	Age ≤ 65 (4)	Age > 65 (5)	CEO Passed Away (6)	CEO Is Alive (7)	No College (8)	College (9)
OROA	0.00007 (0.00024)	-0.00040*** (0.00015)	-0.00055** (0.00024)	-0.00060*** (0.00012)	-0.00025 (0.00024)	-0.00043** (0.00018)	-0.00054*** (0.00013)	-0.00032*** (0.00012)	-0.00083*** (0.00021)
Observations	33,592	61,295	38,176	123,515	9,548	5,701	127,362	87,454	43,897

**Table X—Continued**

Panel B: By Firm Characteristics

	Size (number of employees)		Board Presence		Family Firm Status	
	Smallest Quartile (1)	Largest Quartile (2)	No Board (3)	Board (4)	Nonfamily Firm (5)	Family Firm (6)
OROA	-0.00032** (0.00013)	-0.00081*** (0.00029)	-0.00111*** (0.00031)	-0.00036*** (0.00011)	-0.00033*** (0.00012)	-0.00099*** (0.00023)
Observations	33,284	33,255	37,501	95,562	95,422	26,698

- Subsample analysis is easy to interpret but we don't know whether differences across groups are statistically significant
- Also, at least for CEO characteristics, could be that N Days is distributed differently and that the different coefficients reflect nonlinearities
  - alternative: N Days fixed effects & interaction term (N Days X subsample)

## What I liked / what could be improved



- 
- Writing is overall very good and clear. Especially introduction: every paragraph has a clear purpose & gets right to the point
  - Setting is very clean – and yet authors manage to create some “tension” regarding potential endogeneity issues
    - “building a strawman” (and then showing it doesn’t explain results) is often a helpful strategy
  - Results are quite rich (heterogeneity, turnover, etc.)
  - Paper also has balanced discussion on external validity
  
  - Room for improvement: tables/figures (no “killer chart”)
  - Less important: discussion of IV estimates & execution of heterogeneity analysis

# Paper reading for next week



*The Journal of* FINANCE  
*The Journal of* THE AMERICAN FINANCE ASSOCIATION

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## **The Impact of Repossession Risk on Mortgage Default**

TERRY O'MALLEY\*

### **ABSTRACT**

I study the effect of removing repossession risk on a mortgagor's decision to default. Reducing default costs may result in strategic default, particularly during crises when homeowners can be substantially underwater. I analyze difference-in-differences variation in repossession risk generated by an unexpected legal ruling in Ireland that prohibited collateral enforcement on delinquent residential mortgages originated before a particular date. I estimate that borrowers defaulted by 0.3 percentage points more each quarter after the ruling, a relative increase of approximately one-half. High loan-to-value ratios and low liquidity are associated with a larger treatment effect, suggesting both equity and consumption-based motivations.

- If you have not seen diff-in-diff before, I recommend reading Section 7.6 of Verbeek or Section 4 of Roberts-Whited before reading this paper