Are Managers in Short Supply? Evidence from Sudden Deaths

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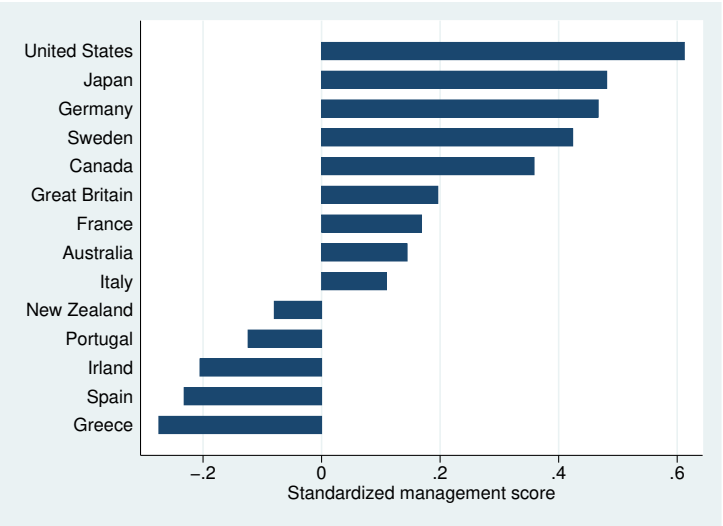
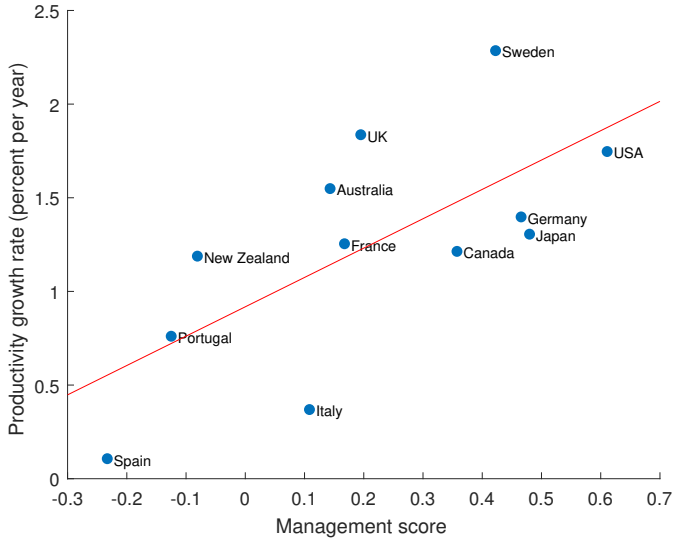
Motivation

- Management matters for firms performance and productivity (e.g. Bertrand and Scholar 2003, Bloom and Van Reenen 2010)
  - Large differences in the quality of managerial practices across countries ...



(a) Management score



(b) Labor productivity growth, 1995-2008

Source: Schivardi-Schmitz, 2020, World Management Survey for management score (average at the country level of firms practices), and Groningen database for productivity growth

  - ... which are correlated with differences in productivity growth

Why do firms allocate control to inferior managerial talent?

- Frictions within firms?
  - Received wisdom: reluctance to transfer decision power to outsiders?
- We shift the focus on the supply of managers
  - Is there a scarcity of managerial skills?
  - Does it matter for firm performance and aggregate productivity?
- Policy implications of the two stories are different:
  - If demand, then the issue is how to open up firms to external skills: Private equity, stock market, family succession....
  - If supply, then schooling (business schools), mobility, capacity to attract talent play a role

This paper

1. Exploits exogenous shocks to executives' team
   - Uses death events hitting managers
2. Traces impact on firm performance and other executives separately for thin and thick local labor markets
   - Is the effect stronger in markets with a thinner supply of managerial skills?
   - Nail down the impact of executives' supply looking at changes in pay for other executives on the same local labor market
3. Shows evidence of poor executives-firm matches following deaths in thin markets
   - Use executives' hirinngs/separations and education data of managers

Related Literature

- Top Management and Firms Outcomes
  - Management and Performance: e.g. Bertrand and Schoar 2003; Bloom and Van Reenen 2007, 2010
  - Deaths as source of identification: e.g. Bennedsen et al. 2007, 2010, Becker and Hvide 2013
- Scarcity of Skilled Workers and Agglomeration Effects
  - Marshall 1890, survey in Moretti 2011
- Effects of Labor Supply Shocks on Firm Performance and Co-workers
  - Market-wide labor shocks: e.g. Katz and Murphy 1992, Card 2009, Dustmann, Ludsteck, and Schonberg, 2009
  - Workers exit and co-workers wages and retention probabilities: e.g. J ager 2016, Bovini and Paradisi 2018

Outline

Data

Matched employer-employee records: VisitInps

- Universe of private sector employees in Italy
- All managers (*dirigenti)* from 2005 to 2016 (CZ location not available before)
- Total compensation (fixed+variable) adjusted for inflation (dropped if below annually 50,000 euros in 2015 constant terms)
- Track managers' compensation, death and transition between firms

Firm information: Cerved

- Balance sheets of all incorporate companies
- Track firms performance

Deaths events hitting managers:

- We observe year of death for each worker
- Possible to focus on "unexpected deaths": below age 60 and excluding managers with sick leave prior to death (*malattia*)

Source of identification: Unexpected executives' deaths

- Is the supply of top managerial skills a determinant of firm performance?
- Treatment: deaths of executives before age 60
  - Expected separations can be prepared and therefore not necessarily informative on supply
  - 1,077 events in our sample
  - Empirically: exploit the fact that firms tend to find replacement by hiring new managers on the same local labor market
- Firm performance might drop independently from executives supply, e.g. due to firm-specific human capital that gets lost with death
- Strategy: estimate the effect of executive's death on firm performance according to the thickness of the local market for executives

Identification strategy

- Defining labor markets for executives
  - All managers in the same commuting zone (CZ) X industry
  - Around 600 CZs (*sistemi locali del lavoro*) and 19 two-digit industries
  - Benchmark: construct dummies for thin and thick local labor markets based on a split according to the sample median of the number of managers in the same market.

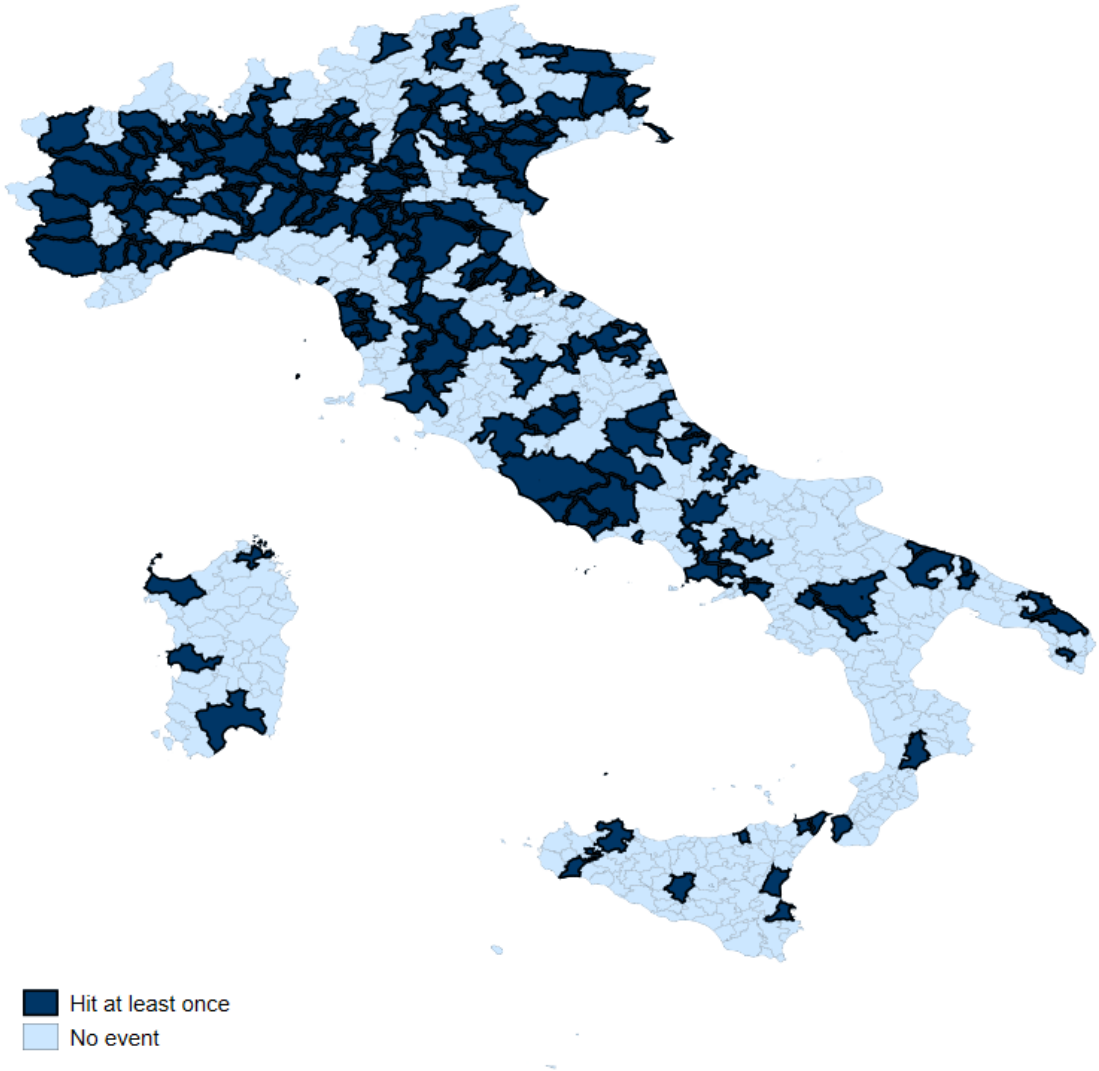
- Difference-in-differences approach in our firm sample:

$$\text{ROA}_{i,j,t} = (\beta_{\text{tn}}\text{Thin}_{jt} + \beta_{\text{tk}}\text{Thick}_{jt}) \times \text{DecEx}_{i,\tau} + \beta_2 X_{i,t} + f_i + d_{cz,t} + d_{s,t} + \eta_{i,j,t}$$

- Direct evidence on the mechanism – if effects driven by difficulty of finding replacement on external labor market, we should see an increase in other executives' wages in the same market. For this, we test in our executive sample:

$$\text{Ln(Wage)}_{k,-i,j,t} = \gamma_{cz,t} + \pi_{s,t} + (\gamma_{\text{tn}}\text{Thin}_{jt} + \gamma_{\text{tk}}\text{Thick}_{jt}) \times \text{DecEx}_{j,\tau} + \gamma_2 X_{-ik,t} + f_{-i} + f_k + u_{k,t}$$

Location of Executives Death Event



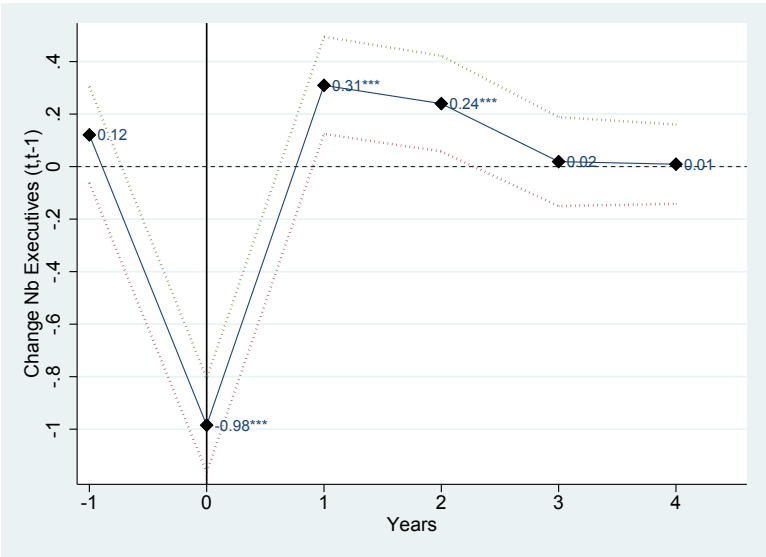
This map presents executives death events located in each Italian Commuting Zones over the sample period

Patterns in Executive Transitions - In the Hierarchy

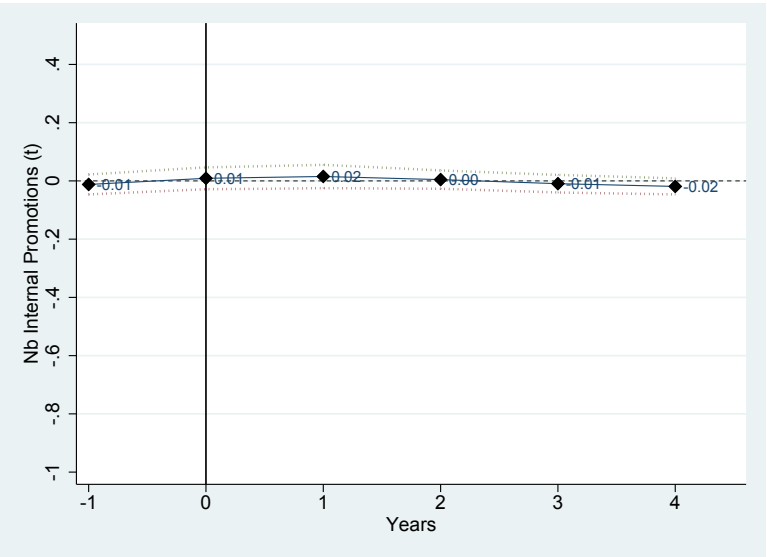
Promotion to executives' positions are limited

In the Hierarchy	Full sample		Conditional on turnover	
	White-collars (t)	Executives (t)	White-collars (t)	Executives (t)
White-collars (t-1)	99.7%	0.3%	98.7%	1.3%
Executives (t-1)	0.5 %	99.5%	4.8%	95.2%

Following death events:



(c) Delta # Executives



(d) # Internal Promotions

Executive Transitions between Industries and Areas

Mobility across areas and industries is limited

Executives transitions:	Data	Assuming random
% within same CZ	0.65	0.13
% within same 2-digit industry	0.55	0.12
% within same CZ $\times$ 2-digit industry	0.39	0.017

Italy is **not** an outlier

France (DADS Panel)	Data	Assuming random
% within same CZ	0.71	0.15
% within same Industry (NES 17)	0.66	0.13
% within same CZ $\times$ Industry	0.50	0.03

Top executives U.S. listed firms	Data	Assuming random
% within same State	0.32	0.055
% within same FF17 industry	0.4	0.14
% within same State $\times$ FF17 industry	0.17	0.012

Market thickness and New Hires Characteristics

Panel A:	Hired Executive from same CZ×Industry?		
ln(1+# NbExecutives (Industry,CZ)) (t-1)	0.025***	0.024***	0.051***
	(0.005)	(0.003)	(0.006)
Year FE	Y	Y	Y
Industry-Year FE		Y	Y
CZ-Year FE			Y
Observations	46,547	46,547	46,547
R^2	0.020	0.067	0.197

Panel B:	Executive Education Level		
	Below High School	High School	College
ln(1+# NbExecutives (Industry,CZ)) (t-1)	-0.002	-0.013*	0.015**
	(0.004)	(0.007)	(0.007)
Industry-Year FE	Y	Y	Y
CZ-Year FE	Y	Y	Y
Observations	15,627	15,627	15,627
R^2	0.093	0.118	0.125

Descriptive statistics

Firm sample

	Obs.	Mean	Std. Dev.	p1	p50	p99
ROA	321,804	0.021	0.190	-0.854	0.036	0.424
Labor Productivity	306,498	80.383	74.289	-78.330	65.261	360.974
Ln(Assets)	321,804	9.061	1.763	4.500	9.108	13.324
Firm Age	321,804	17.077	12.679	1.000	14.000	48.000
Number of executives	321,804	3.173	18.192	0.000	1.000	38.000
Deceased executive (t,t-3) (%)	321,804	0.773	8.755	0.000	0.000	0.000
Retired executive (t,t-3) (%)	321,804	8.201	27.438	0.000	0.000	100.000
Executive separation rate	321,804	0.040	0.169	0.000	0.000	1.000

	Thin Labor Markets			Thick Labor Markets		
	Obs.	Mean	Std. Dev.	Obs.	Mean	Std. Dev.
ROA	161,176	0.018	0.167	160,628	0.023	0.211
Ln(Assets)	161,176	9.32	1.68	160,628	8.79	1.80
Age	161,176	17.53	12.71	160,628	16.61	12.62

	Eventually Treated			Never Treated		
	Obs.	Mean	Std. Dev.	Obs.	Mean	Std. Dev.
ROA	9,003	0.048	0.133	312,801	0.020	0.191
Ln(Assets)	9,003	11.13	1.94	312,801	9.001	1.721
Age	9,003	16.66	11.88	312,801	17.08	12.70
CZ $\times$ Industry characteristics						
Number executives (CZ$\times$ Industry)	33,543	28.828	221.624	1.000	4.000	328.000
At least one Deceased executive (CZ$\times$ Industry)	33,543	0.020	0.141	0.000	0.000	1.000

Descriptive statistics

Executive sample

	Obs.	Mean	Std. Dev.	p1	p50	p99
Sample of deceased executives						
Executive Tenure	1,077	11.903	8.018	1.000	10.000	30.000
Executive Age	1,077	52.837	5.505	37.000	54.000	60.000
Female	1,077	0.097	0.296	0.000	0.000	1.000
Wage (t-1)	1,077	136.342	93.873	55.521	113.151	519.764
Sample of non-deceased executives						
Executive Tenure	1,062,408	9.853	7.285	1.000	8.000	29.000
Executive Age	1,062,408	48.464	6.599	34.000	49.000	60.000
Female	1,062,408	0.132	0.339	0.000	0.000	1.000
Wage (t-1)	1,062,408	135.064	114.674	54.994	110.672	498.745
Education of new hires (from 2010)						
Below High-School	15,627	0.053	0.224	0.000	0.000	1.000
High-School	15,627	0.211	0.408	0.000	0.000	1.000
College	15,627	0.727	0.445	0.000	1.000	1.000

Outline

Top Executives' Death and Firms' ROA

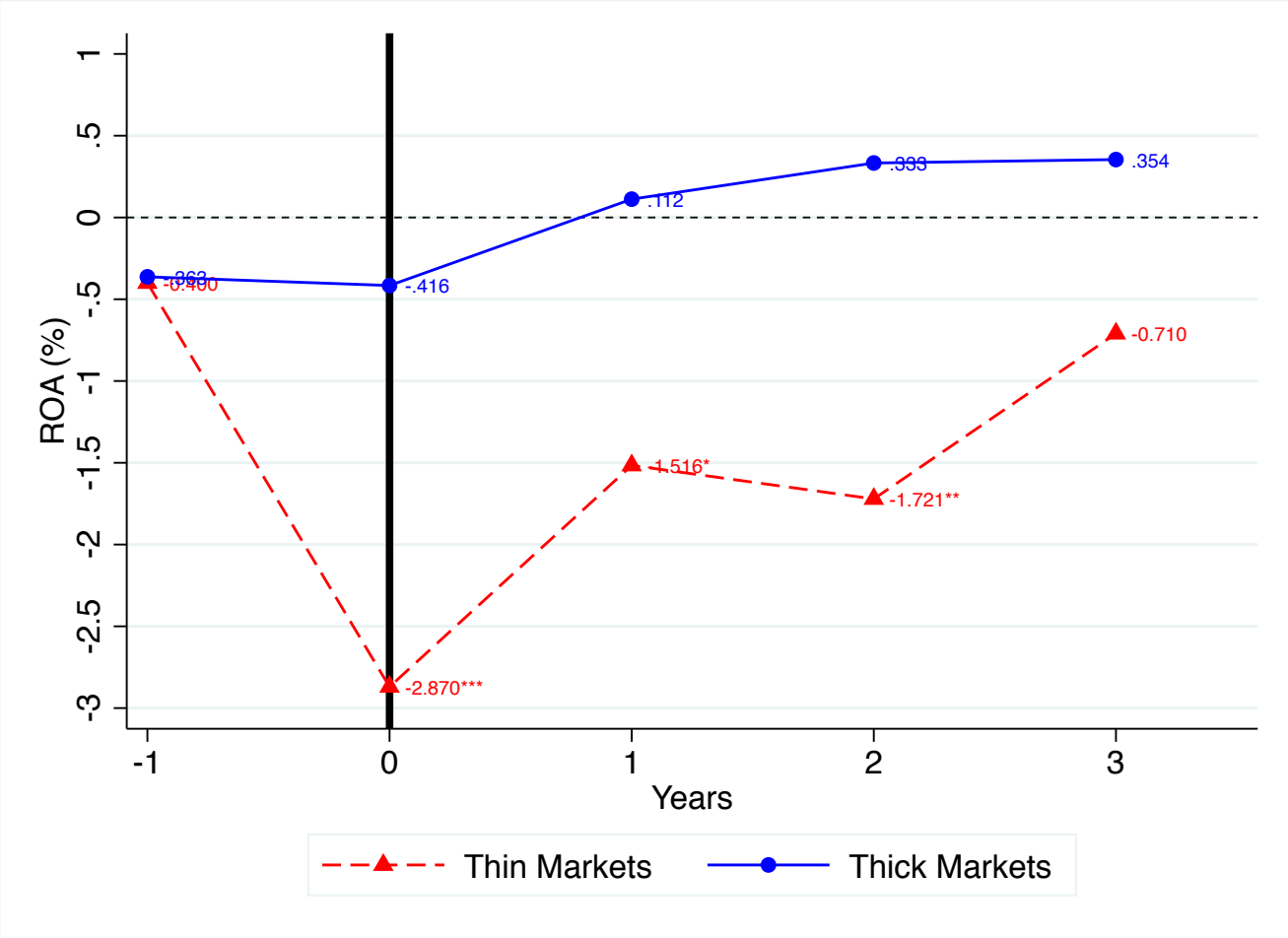
	ROA ($\times$ 100)			
Deceased executive (t,t-3)	-0.770**	-0.927**	-0.816**	-0.831**
	(0.393)	(0.395)	(0.397)	(0.397)
Year FE	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y
Industry-Year FE		Y	Y	Y
CZ-Year FE		Y	Y	Y
Size, Age, ROA (t-3) $\times$ Year FE			Y	Y
Nb of executives (t-3) $\times$ Year FE				Y
Observations	321,804	321,804	321,804	321,804
R^2	0.469	0.477	0.479	0.480

Top Executives' Death and Firms' ROA in thin and thick markets

	ROA (× 100)			
Deceased executive (t,t-3) × thin market	-1.582***	-1.845***	-1.834***	-1.849***
	(0.562)	(0.562)	(0.586)	(0.586)
Deceased executive (t,t-3) × thick market	0.018	-0.065	0.154	0.137
	(0.537)	(0.542)	(0.527)	(0.528)
Thin market	-0.111	0.046	-0.156	-0.146
	(0.325)	(0.362)	(0.367)	(0.367)
Year FE	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y
Industry-Year FE		Y	Y	Y
CZ-Year FE		Y	Y	Y
Size, Age, ROA (t-3) × Year FE			Y	Y
Nb of executives (t-3) × Year FE				Y
Observations	321,804	321,804	321,804	321,804
R^2	0.469	0.477	0.479	0.480

Note: Thin markets are those with a number of managers at the CZ-Industry level below the median

Top Executives' Death and Firms' ROA in thin and thick markets: Dynamics



The figure plots the coefficients of a regression that traces the dynamic effects of an executive's death, distinguishing between thin and thick markets

Robustness

Battery of robustness tests:

- Continuous measure of market thickness
- Other outcome variable: labor productivity
- Excluding death events with prior sick leave
- Aggregation at market level

Robustness: continuous measure

	ROA ($\times$ 100)			
Deceased executive (t,t-3)	-2.627***	-3.239***	-3.153***	-3.175***
	(0.892)	(0.913)	(0.945)	(0.944)
Deceased executive (t,t-3) $\times$ Market thickness	0.378**	0.465***	0.472***	0.473***
	(0.155)	(0.160)	(0.161)	(0.161)
Market thickness	-0.107	-0.143	0.015	0.002
	(0.155)	(0.165)	(0.163)	(0.164)
Year FE	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y
Industry-Year FE		Y	Y	Y
CZ-Year FE		Y	Y	Y
Size, Age, ROA (t-3) $\times$ Year FE			Y	Y
Nb of executives (t-3) $\times$ Year FE				Y
Observations	321,804	321,804	321,804	321,804
R^2	0.469	0.477	0.479	0.480

Note: Market thickness defined as the logarithm of one + number of managers in same CZ-Industry

Robustness: labor productivity

Panel A:	Labor productivity (Sales over number of employees)			
Deceased executive (t,t-3) × thin market	-6.628***	-7.471***	-7.181***	-7.464***
	(2.106)	(2.145)	(2.150)	(2.149)
Deceased executive (t,t-3) × thick market	2.679	2.597	3.034	2.765
	(1.993)	(2.040)	(2.019)	(2.021)
Thin market	-0.878	1.146	1.075	1.135
	(1.097)	(1.268)	(1.320)	(1.321)
Year FE	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y
Industry-Year FE		Y	Y	Y
CZ-Year FE		Y	Y	Y
Size, Age, ROA (t-3) × Year FE			Y	Y
Nb of executives (t-3) × Year FE				Y
Observations	306,498	306,498	306,498	306,498
R^2	0.700	0.707	0.716	0.717
Panel B: Continuous market thickness				
Deceased executive (t,t-3)	-11.628***	-14.001***	-13.776***	-14.212***
	(3.229)	(3.322)	(3.316)	(3.309)
Deceased executive (t,t-3) × Market thickness	1.980***	2.351***	2.380***	2.411***
	(0.565)	(0.581)	(0.572)	(0.570)
Market thickness	0.313	-0.125	-0.135	-0.830
	(0.600)	(0.655)	(0.680)	(0.681)
Observations	306,498	306,498	306,498	306,498
R^2	0.700	0.707	0.716	0.717

Robustness: excluding deceased executives with prior sick leave

	ROA (× 100)			
Deceased executive (t,t-3) × thin market	-1.578***	-1.835***	-1.861***	-1.876***
	(0.580)	(0.579)	(0.605)	(0.605)
Deceased executive (t,t-3) × thick market	0.047	-0.040	0.138	0.125
	(0.553)	(0.559)	(0.538)	(0.539)
Thin market	-0.105	0.050	-0.152	-0.141
	(0.326)	(0.363)	(0.368)	(0.368)
Year FE	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y
Industry-Year FE		Y	Y	Y
CZ-Year FE		Y	Y	Y
Size, Age, ROA (t-3) × Year FE			Y	Y
Nb of executives (t-3) × Year FE				Y
Observations	321,327	321,327	321,327	321,327
R^2	0.469	0.477	0.480	0.480

- Robustness: survive aggregation at **market level**

Outline

The effect on executives wages in other firms in the same CZ-Industry

Firms in thick markets might just be weaker–check for a specific implication of executive supply: executive wages in other firms

	Executives Ln(Wage) (× 100)			
Deceased executive other firm (t-1)	0.229			
	(0.201)			
Deceased executive other firm (t-1) × thin market		0.442**	0.355*	0.357**
		(0.176)	(0.185)	(0.174)
Deceased executive other firm (t-1) × thick market		0.108	0.018	0.002
		(0.193)	(0.207)	(0.204)
Thin market		-0.359	-0.214	-0.416
		(0.314)	(0.353)	(0.352)
Year FE	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y
Executive FE	Y	Y	Y	Y
Industry-Year FE			Y	Y
CZ-Year FE			Y	Y
Age, Tenure, Gender × Year FE				Y
Observations	628,582	628,582	628,582	628,582
R^2	0.912	0.912	0.915	0.917

Improvements in performance of competitors? No

- No effect on **white collars compensation**

- Still strong effects when we restrict the sample to **tradable industries** only, in which local business stealing effects should be a priori muted

Outline

Mechanism: evidence on match quality

- Theory predicts that in thin markets it should be harder to form good matches

- Look at two proxies for the quality of the matches formed after the death event in thin and thick markets
  - Executives' separation rates within affected firms
  - Education levels of entrants and leavers

Separation rates

	Executive separation rate			
Deceased executive (t-1,t-3)	0.009**			
	(0.004)			
Deceased executive (t-1,t-3) × thin market		0.014**	0.013**	0.016**
		(0.006)	(0.007)	(0.007)
Deceased executive (t-1,t-3) × thick market		0.005	0.004	0.006
		(0.005)	(0.005)	(0.005)
Thin market		-0.006*	-0.005	-0.004
		(0.003)	(0.003)	(0.003)
Firm FE	Y	Y	Y	Y
Industry-Year FE	Y	Y	Y	Y
CZ-Year FE	Y	Y	Y	Y
Size, Age, ROA (t-3) × Year FE			Y	Y
Nb of executives (t-3) × Year FE				Y
Observations	321,804	321,804	321,804	321,804
R^2	0.175	0.175	0.181	0.209

Education Levels of Entrants/Leavers

Caveat: education-level data available only for (60% of) contracts signed after 2010

	New Hires			
	Below High School	High School	College	Missing Info
Deceased executive (t-1,t-3) × thin market	0.046*	0.083*	-0.134***	-0.051
	(0.024)	(0.048)	(0.051)	(0.057)
Deceased executive (t-1,t-3) × thick market	0.006	-0.021	0.037	-0.043
	(0.019)	(0.027)	(0.031)	(0.057)
Thin market	-0.034	-0.089	0.108	0.013
	(0.046)	(0.073)	(0.079)	(0.082)
Firm FE	Y	Y	Y	Y
Industry-Year FE	Y	Y	Y	Y
CZ-Year FE	Y	Y	Y	Y
Observations	15,627	15,627	15,627	24,239
R^2	0.790	0.694	0.704	0.739

	Leavers			
	Below High School	High School	College	Missing Info
Deceased executive (t-1,t-3) × thin market	-0.029	-0.152**	0.183**	0.013
	(0.047)	(0.073)	(0.088)	(0.030)
Deceased executive (t-1,t-3) × thick market	0.033	-0.040	0.025	-0.018
	(0.030)	(0.036)	(0.044)	(0.029)
Thin market	0.195	-0.083	-0.089	-0.006
	(0.149)	(0.188)	(0.125)	(0.073)
Firm FE	Y	Y	Y	Y
Industry-Year FE	Y	Y	Y	Y
CZ-Year FE	Y	Y	Y	Y
Observations	6,087	6,087	6,087	25,213
R^2	0.836	0.809	0.807	0.554

Outline

1. Data and Identification
2. Results
   - Firm Performance
   - Executives' Pay
   - Match Quality
3. **Discussion**

External validity

- How do our findings speak to the implications of labor market thickness for firm performance in "normal times"?
  - Exploit "expected" executive exit, i.e. executive retirement

	ROA (× 100)			
Retired executive (t,t-3)	-0.433***			
	(0.143)			
Retired executive (t,t-3) × thin market		-0.666***	-0.521***	-0.513***
		(0.177)	(0.178)	(0.179)
Retired executive (t,t-3) × thick market		-0.204	-0.165	-0.159
		(0.218)	(0.217)	(0.218)
Thin market		0.072	-0.139	-0.129
		(0.363)	(0.368)	(0.368)
Firm FE	Y	Y	Y	Y
Industry-Year FE	Y	Y	Y	Y
CZ-Year FE	Y	Y	Y	Y
Size, Age, ROA (t-3) × Year FE			Y	Y
Nb of executives (t-3) × Year FE				Y
Observations	321,804	321,804	321,804	321,804
R^2	0.477	0.477	0.479	0.480

As expected, effects are weaker, but still negative effect in thin markets only.

Economic significance

- Total value of aggregate losses associated to death events?
  - Apply our estimated coefficient (-1.849) to the euro value of affected firms' assets
  - Aggregate lost profits across the set of affected firms in thin markets only
  - Find lost profit amount to around 21 billion euros over sample period, 0.3% of aggregate corporate profits in Italy
  - (large given the rare frequency of death events)

Conclusion

- Robust evidence that the supply of managerial skills matters for firm performance:
  - Firms in thin markets experience a drop of 1.8 in ROA following death effects
  - Executives' wages of neighboring firms increase
- Thin labor markets lead to poorer firm-executive matches:
  - death events are followed by an increase in the separation rate for the other executives of the firm, in particular for those with a college degree.
- Suggest that local policies aiming at boosting the training/supply of executives might be effective at increasing firm performance and aggregate productivity.

The effect on other white-collars' wages in other firms in the same CZ-Industry

Back

	White-Collars Ln(Wage) (× 100)			
Deceased executive other firm (t-1)	0.064			
	(0.089)			
Deceased executive other firm (t-1) × thin market		0.054	-0.017	0.006
		(0.161)	(0.128)	(0.123)
Deceased executive other firm (t-1) × thick market		0.047	0.079	0.081
		(0.104)	(0.076)	(0.077)
Thin market		-0.200	0.154	0.057
		(0.268)	(0.274)	(0.245)
Year FE	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y
Executive FE	Y	Y	Y	Y
Industry-Year FE			Y	Y
CZ-Year FE			Y	Y
Age, Tenure, Gender × Year FE				Y
Observations	3,307,706	3,307,706	3,307,706	3,307,706
R^2	0.938	0.939	0.941	0.944

The effect on other executives wages in other firms in the same CZ-Industry – Tradeable sectors

Back

	Executives Ln(Wage) (× 100)			
Deceased executive other firm (t-1)	0.489**			
	(0.200)			
Deceased executive other firm (t-1) × thin market		0.714***	0.620***	0.548**
		(0.216)	(0.236)	(0.230)
Deceased executive other firm (t-1) × thick market		0.333	-0.007	0.002
		(0.265)	(0.239)	(0.231)
Thin market		-0.359	-0.214	-0.416
		(0.314)	(0.353)	(0.352)
Year FE	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y
Executive FE	Y	Y	Y	Y
Industry-Year FE			Y	Y
CZ-Year FE			Y	Y
Age, Tenure, Gender × Year FE				Y
Observations	332,130	332,130	332,130	332,130
R^2	0.914	0.914	0.918	0.921

Effects on other firms' ROA

Back

	ROA (× 100)			
Deceased manager in CZ*Industry (t)	-0.017	-0.068	-0.022	-0.017
	(0.124)	(0.128)	(0.149)	(0.149)
Deceased Manager (t)	-1.382***	-1.333***	-1.321***	-1.286**
	(0.488)	(0.487)	(0.502)	(0.500)
Year FE	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y
Size, Age, ROA (t-3) × Year FE	Y	Y	Y	Y
Industry-Year FE		Y	Y	Y
CZ-Year FE			Y	Y
Nb of Managers (t-3) × Year FE				Y
Observations	227103	227103	226420	226420
R^2	0.510	0.513	0.521	0.521

Robustness: Regressions at the market level

Back

	Market ROA (× 100)			
Deceased executive in Industry×CZ (t,t-3)	-0.291			
	(0.194)			
Deceased executive in Industry×CZ (t,t-3) × thin market		-0.507**	-0.535**	-0.516**
		(0.228)	(0.225)	(0.225)
Deceased executive in Industry×CZ (t,t-3) × thick market		0.330	0.389	0.386
		(0.315)	(0.318)	(0.318)
Thin market		0.036	-0.005	0.001
		(0.456)	(0.462)	(0.461)
(Industry× CZ) Market FE	Y	Y	Y	Y
Industry-Year FE	Y	Y	Y	Y
CZ-Year FE	Y	Y	Y	Y
Market Average Size, Age, ROA (t-3) × Year FE			Y	Y
Market Nb of executives (t-3) × Year FE				Y
Observations	15,416	15,416	15,416	15,416
R^2	0.660	0.660	0.666	0.667