Senior Management Gender Composition and Firm performance in Europe

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Introduction

- motivation: (Croson & Gneezy, JEL,09)
  - economic experiments find robust gender differences in risk aversion and competitive preferences
  - ... may translate into differences in firm performance between men and women-led firms
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  - *post* selection into management/entrepreneurship

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  - *post* selection into management/entrepreneurship
- today: data construction, data overview, preliminary shock analysis

Data construction

- raw data retrieved from annual versions (disks) of Amadeus/Orbis Europe provided by Bureau van Dijk - A Moody's Company
  - annual versions of Amadeus (1999-2015) and under its alternative name Orbis Europe (2016-2020)
  - time variation in management

Data construction - Steps

1. retrieve information under the 'management' heading from Amadeus/Orbis
   - from 2005 onwards
   - current managers
   - firm identifier, manager first and last name, management title, management gender, position, and committee membership
   - attribute information to year of version

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6. match with firms' financial information (Merlevede et al. (15); Kalemli et al. (22))

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  - availability financial accounts
  - unconsolidated accounts
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  - employer firms
  - drop firms that never report employees

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  - drop firms that never report employees
- 13,029,641 firms; 75,182,724 firm-year obs., 2005-19
  - (no full info on all financial items)

Data Construction: Financial items and data availability

Table: Summary statistics (firm-year observations)

	No.	Mean	Stdev.	p25	Median	p75
# managers	75,182,724	1.6	1.9	1.0	1.0	2.0
real total assets (log)	51,041,015	12.4	2.2	11.0	12.5	13.9
employees	52,520,157	10.8	26.6	1.0	3.0	7.0
leverage	36,337,248	0.73	0.99	0.28	0.58	0.85
WLP-TFP (log)	13,634,543	6.0	1.2	5.3	6.1	6.8

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  - across industries between 23% and 45%

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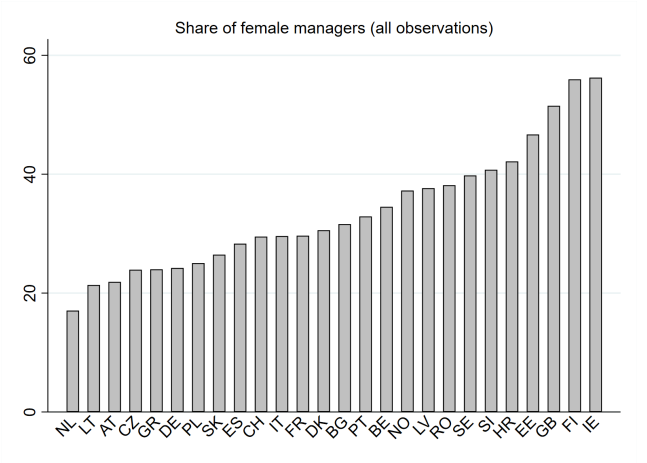
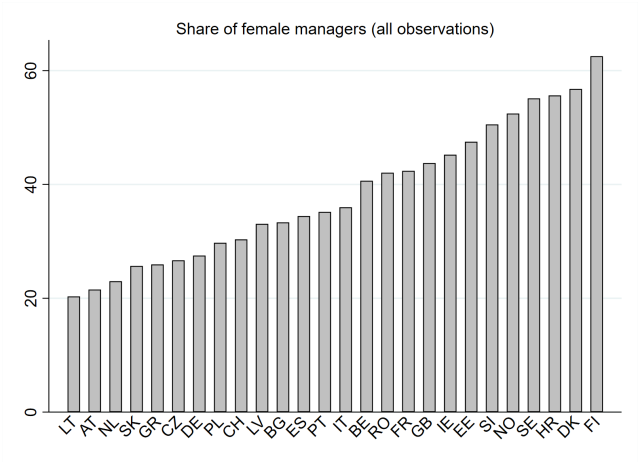
- varies more across countries than industries
  - across countries between 18% and 73%
  - across industries between 23% and 45%

- management composition fairly stable over time
- changes in the share of female managers within existing firms above e.g. the 50% threshold are scarce: 0.8% of observations

Female managers as share of total managers across countries



Share of female managers across countries - at least three managers



Generally higher share of female managers because micro firms with single manager are predominantly male-led

Senior management size and the share of female managers

	firms		share of female managers				
	share	**#**	**0**	**1-25**	**26-50**	**51-99**	**100**
# managers							
1	62.3	46,848,366	77.0				23.0
2	26.3	19,741,345	45.7		22.4		31.9
3	6.9	5,198,305	40.6		19.8	15.3	24.3
4	2.5	1,878,552	33.5	18.8	13.9	11.7	22.1
5-10	1.9	1,400,226	29.1	22.7	19.3	18.6	10.3
>10	0.2	115,930	12.3	46.9	30.6	9.8	0.5
Total	100.0	75,182,724					

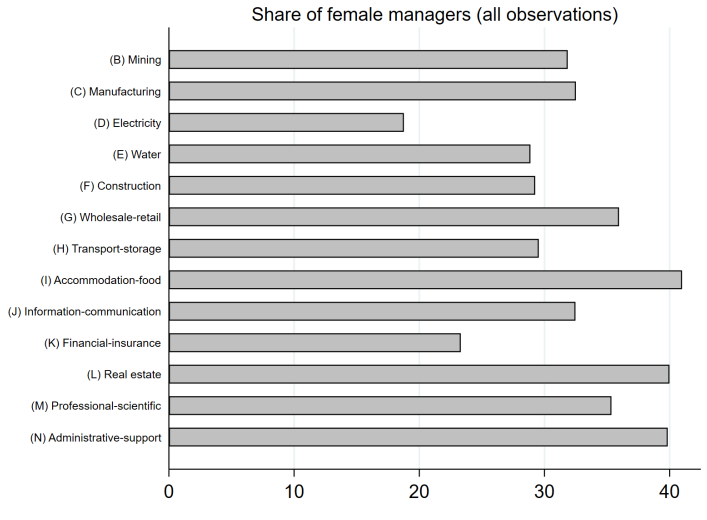
Firm size and the share of female managers

	firms		share of female managers				
	share	**#**	**0**	**1-25**	**26-50**	**51-99**	**100**
firm size							
micro	80.8	42,449,524	67.0	0.5	7.3	1.1	24.1
small	14.8	7,787,390	64.9	2.2	9.8	3.0	20.1
medium	3.6	1,900,598	60.5	6.2	13.7	4.8	14.7
large	0.7	382,645	58.2	12.5	16.1	4.3	8.8
Total	100.0	52,520,157					

Senior management size and firm size

	firms		firm size			
	share	**#**	**micro**	**small**	**medium**	**large**
# managers						
1	65.3	34,286,151	86.4	11.3	2.0	0.3
2	23.6	12,390,419	77.5	17.9	3.9	0.7
3	6.6	3,440,104	63.1	26.7	8.5	1.7
4	2.4	1,270,203	52.3	31.7	13.1	3.0
5-10	2.0	1,034,782	36.2	34.4	22.6	6.8
>10	0.2	98,498	19.9	27.9	30.5	21.7
Total	19.3	52,520,157				

Share of female managers across industries



Firm outcomes and senior management gender composition

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- given limited variation within firms in terms of gender composition compare male and female-led firms within tight country-4-digit-industry-year combinations:

$$outcome_{ijct} = \beta_1 female_{ijct} + \beta_2 controls_{ijct} + \delta_{jct} + \epsilon_{ijct} \quad (1)$$

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- dummy variable for female-led firms (at least 50% female managers)
  - little difference between different thresholds
- focus on SMEs with between 10 and 250 employees
  - estimation sample 9,681,259 observations on management
  - on average 2.1 managers/firm out of which 0.63 are female

Real outcomes

	(1) TA	(2) L	(3) K	(4) Y	(5) RevEff	(6) TFP	(7) W
female	-0.111***	-0.038***	-0.006*	-0.033***	-0.031***	-0.025***	-0.020***
	[0.002]	[0.001]	[0.003]	[0.001]	[0.001]	[0.001]	[0.001]
foreign	0.781***	0.282***	0.328***	0.195***	0.189***	0.256***	0.243***
	[0.004]	[0.003]	[0.007]	[0.003]	[0.003]	[0.003]	[0.002]
age	0.383***	0.134***	0.454***	-0.070***	-0.062***	-0.076***	0.020***
	[0.001]	[0.001]	[0.002]	[0.001]	[0.001]	[0.001]	[0.001]
size				0.712***	0.357***	0.307***	0.135***
				[0.001]	[0.001]	[0.001]	[0.000]
listed	1.138***	0.411***	1.241***	-0.437***	-0.427***	-0.273***	0.069***
	[0.040]	[0.026]	[0.051]	[0.033]	[0.028]	[0.026]	[0.014]
obs.	8,246,451	9,629,265	7,921,914	4,921,122	4,921,122	3,195,927	4,249,804
R-sq.	0.422	0.172	0.306	0.781	0.681	0.732	0.831
C-I-Y FE	Y	Y	Y	Y	Y	Y	Y

Real outcomes - Senior management size

	TA	L	K	Y	RevEff	TFP	W
	Single manager SME						
female	-0.106***	-0.024***	-0.064***	-0.021***	-0.024***	-0.012***	-0.009***
	[0.003]	[0.002]	[0.005]	[0.002]	[0.002]	[0.002]	[0.001]
obs.	3,672,609	4,506,941	3,502,129	2,105,320	2,105,320	1,397,324	1,690,731
R-sq.	0.422	0.192	0.302	0.770	0.703	0.730	0.853
	At least two manager SME						
female	-0.198***	-0.097***	-0.054***	-0.056***	-0.038***	-0.043***	-0.035***
	[0.003]	[0.002]	[0.004]	[0.002]	[0.002]	[0.002]	[0.001]
obs.	4,546,377	5,093,800	4,392,184	2,789,184	2,789,184	1,778,922	2,535,533
R-sq.	0.414	0.187	0.313	0.781	0.658	0.729	0.794
controls	Y	Y	Y	Y	Y	Y	Y
C-I-Y FE	Y	Y	Y	Y	Y	Y	Y

Financial outcomes

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	leverage	leverage		current	solvency	RoA	profit
		financial	non-fin.	ratio			margin
female	-0.023***	-0.002***	-0.023***	0.092***	0.019**	0.385***	0.005***
	[0.001]	[0.000]	[0.001]	[0.007]	[0.008]	[0.026]	[0.000]
obs.	5,508,004	4,799,692	4,799,692	5,675,120	2,682,674	4,519,116	3,726,598
R-sq.	0.129	0.189	0.197	0.171	0.089	0.086	0.096
controls	Y	Y	Y	Y	Y	Y	Y
C-I-Y FE	Y	Y	Y	Y	Y	Y	Y

Financial outcomes - Senior management size

	leverage	leverage		current	solvency	RoA	profit
		financial	non-fin.	ratio			margin
	Single manager SME						
female	-0.009***	-0.002**	-0.009***	0.051***	0.031**	0.267***	0.003***
	[0.001]	[0.001]	[0.001]	[0.012]	[0.015]	[0.050]	[0.000]
obs.	2,257,466	1,893,074	1,893,074	2,298,215	959,460	1,826,468	1,634,649
R-sq.	0.146	0.227	0.221	0.189	0.120	0.109	0.115
	At least two manager SME						
female	-0.025***	-0.000	-0.026***	0.113***	0.007	0.417***	0.006***
	[0.001]	[0.001]	[0.001]	[0.008]	[0.010]	[0.029]	[0.000]
obs.	3,224,239	2,881,041	2,881,041	3,350,655	1,699,446	2,665,810	2,066,972
R-sq.	0.133	0.180	0.195	0.172	0.098	0.095	0.113
controls	Y	Y	Y	Y	Y	Y	Y
C-I-Y FE	Y	Y	Y	Y	Y	Y	Y

Risk aversion, decision making, and response to shocks

Risk aversion, decision making, and response to shocks

- Croson & Gneezy (JEL09): gender differences in risk aversion

- use data in contexts where risk aversion is more likely to play a role
- preliminary results on
  - export decision (Melitz (03): sunk cost)
  - import competition (mimic Bloom et al. (15))
  - uncertainty shocks (Baker et al. (16))

Decision making: Exporting (FR, HR, GR)

	(1)	(2)	(3)	(4)	(5)	(6)
	exporter		export volume		export share	
female	0.016*	0.016*	0.143	0.148	-0.536	-0.529
	[0.008]	[0.008]	[0.108]	[0.108]	[0.489]	[0.489]
$leverage_{t-1}$		-0.003		0.171		0.210
		[0.009]		[0.119]		[0.659]
size	0.087***	0.087***	1.685***	1.687***	4.299***	4.300***
	[0.004]	[0.004]	[0.053]	[0.053]	[0.276]	[0.275]
TFP	0.045***	0.045***	0.945***	0.954***	3.269***	3.281***
	[0.008]	[0.008]	[0.103]	[0.103]	[0.526]	[0.526]
Observations	57,419	57,408	57,419	57,408	57,419	57,408
R-squared	0.290	0.290	0.377	0.377	0.332	0.332
C-I-Y FE	Y	Y	Y	Y	Y	Y

Import shocks (manufacturing)

	Y	L	RevEff.	TFP	K	W
	three year growth					
shock × fem	-0.021**	-0.005	-0.010*	-0.005	0.010	-0.006
	[0.009]	[0.006]	[0.006]	[0.006]	[0.010]	[0.004]
female	0.034***	0.014***	0.007	0.007	-0.017*	0.006*
	[0.008]	[0.005]	[0.005]	[0.005]	[0.010]	[0.004]
leverage	-0.025	0.000	0.002	0.037***	-0.036***	-0.013***
	[0.016]	[0.000]	[0.004]	[0.008]	[0.012]	[0.001]
Observations	232,560	274,860	221,077	162,138	194,785	196,485
R-squared	0.107	0.086	0.104	0.143	0.073	0.116
Controls	Y	Y	Y	Y	Y	Y
C-I-Y FE	Y	Y	Y	Y	Y	Y

Uncertainty shocks (DE, FR, IT, GB, ES)

	Y	L	RevEff.	TFP	K	W
	three year growth					
shock × fem	-0.023	-0.005	-0.005	-0.011**	-0.027***	-0.005*
	[0.017]	[0.005]	[0.005]	[0.005]	[0.009]	[0.003]
female	0.118	0.029	0.021	0.052*	0.135***	0.024
	[0.085]	[0.024]	[0.027]	[0.027]	[0.047]	[0.015]
leverage	-0.000**	-0.000***	0.000	0.005***	-0.011**	-0.000
	[0.000]	[0.000]	[0.000]	[0.002]	[0.005]	[0.000]
Observations	1,663,990	2,276,897	1,595,927	979,950	1,212,144	1,285,687
R-squared	0.064	0.035	0.044	0.068	0.039	0.052
Controls	Y	Y	Y	Y	Y	Y
C-I-M-Y FE	Y	Y	Y	Y	Y	Y

Summary

- Build large firm-level dataset to analyze the evolution of gender differences in risky firm decision-making
  - 75m observations on 13m firms
  - 26 European countries, business economy, 2005-2019
- only 36% firms with at least one female manager
  - varies more across countries than industries
- gender composition within firms is fairly stable
- within tight country-industry-year cells women-led SMEs
  - have lower leverage, are smaller and less productive
  - do not differ in terms of exporting behavior and response to import shocks
  - indication of lower TFP and investment growth in very uncertain environments, but higher growth in environments characterized by low uncertainty