

# Job strategies and organizational capabilities of Italian firms in pre- and after pandemic times

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# Summary

1. Research questions and theoretical framework
  2. Data
  3. Methodology
  4. Results
  5. Conclusions
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# Research questions

- How Italian firms have reacted to the COVID-19 crisis?
    - What **reorganizational and strategic choices** have been adopted?
    - How did firms react in terms of **hiring and firing strategies**?
  - How their pre-existing capabilities structure has mediated responses to the crisis?
    - Did their **pre-crisis attributes** influence their in-crisis responses?
  - How organization capabilities influence quantity and quality of employment?
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# Firms as a locus of knowledge generation

*Capability-based theory of the firm* (Winter, 1997; Dosi&Marengo, 2015; Teece&Pisano, 2003)

- The firm is a constantly-evolving place of learning and knowledge, a collection of (*highly idiosyncratic*) technological-organizational capabilities, where organizational routines are put in force to achieve the corporate goals.
  - The managerial practices are subjected to the collective knowledge of the organization
    - ⇒ There exist no «optimal» industry configurations
    - ⇒ extreme heterogeneity of firms' organization and performance
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# Firms as actors subject to deep restructuring processes

- Three fundamental **attitudes** in analyzing firms' reactions to the crises (*UNIDO Industrial Development Report, 2022*):
    1. **Robustness** → the capacity to absorb the shock, i.e. to survive, maintain operations, sales, profits and employment
    2. **Readiness** → the capacity to transform and recover, i.e. to implement strategic changes in operations;
    3. **Vulnerability** → “incapacity”: conservative and non reactive strategies.
  - The key interpretative variable: **techno-organizational capabilities**, i.e. organizational routines, collective knowledge, procedures and shared behaviours to operate production processes.
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# Workplaces as locus of crystallized power structures

The employer-employee relationships are inbuilt in the socio-organizational structure of the firms

Workplaces are loci characterized by high level of hierarchical structures

Over the last twenty years, workplaces have become more and more hierarchical

The construction of firm hierarchies passes through the hiring and firing process of job profiles

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# The data sources - 1

We progressively integrated **three main ISTAT microdata sources (and one administrative source)**:

1. **Frame-Sbs** → business register; for all 4.4 million firms operating in Italy, it reports information on:
  - ✓ Structure (size, industry, location, belonging to a group, composition of workers)
  - ✓ Performance (profit-and-loss account; international trade)
1. **Permanent business census (IMCPI)** → large multi-purpose survey (MPS) involving over 200,000 firms with **3+ persons employed** (reference universe: ≈1 Mln firms, accounting for 24% of total firms, 84.4% of value added, 76.7% of workers, 91.3% of employees). Information on firms' strategies about:
  - ✓ Governance (ownership, management, belonging to groups)
  - ✓ Human capital (investment, skills, competences etc.)
  - ✓ Inter-enterprise relations (contracting/subcontracting, partnerships, etc.)
  - ✓ Competitiveness instruments (price, quality, innovation, location, network, etc.)
  - ✓ Technology (use of Ict, I4.0 technologies, platforms, etc.)
  - ✓ Finance (sources, bank-firm relationship type and conditions, etc.)
  - ✓ Internationalization (international outsourcing, via offshoring or agreement; number and type of counterpart etc.)

# The data sources - 2

3. **The Covid-19 survey (SPIESC; 2<sup>nd</sup> wave; December 2020)** → a subsample of IMCPI; about 90,000 firms with **3+ persons employed**. Information on firms' 2020 strategies on:
  - ✓ Impact of the pandemic (ex. Turnover losses, domestic vs. foreign demand, supply problems, commodities price increases, etc.)
  - ✓ Human Resources management and policies (ex. Remote working, changes in working hours, use of mandatory holidays, postponement of planned recruitment, layoffs, etc...);
  - ✓ Finance (ex. use of liquid vs. non liquid sources, changes in payment terms and conditions with suppliers and customers, request of new bank credit, crowdfunding etc...)
  - ✓ Digitalization and Technology (ex. Changes in communication strategies, marketing, relationships with customers and suppliers, etc.)
  - ✓ Firms' critical issues (ex. State of firm's overall solidity, domestic vs. foreign demand perspectives, supply chain, etc...) and strategic orientations (ex. Production of new goods, changes in business organisation, in firm's positioning on domestic and international markets, changes in productive inter-enterprise relationships, etc...)
4. **The Ministry of Labour data on "Comunicazioni obbligatorie" (mandatory communications)** information on all Italian firms' flows of recruitment, termination and transformation of jobs contracts



# The dataset

The **main integrated dataset** is an example of the potential of the Istat “dualistic approach” to official statistics (integrating administrative and statistical data sources, with full consistency between micro and macro results):

- ✓ about 110,000 firms with 10+ persons employed (our target size), representative of a universe of about 215,000 units (51%)
- ✓ 9 million persons employed (54.7% of the total)
- ✓ 557 billion euros of value added (71.4%)
- ✓ 3,700 large enterprises (250+ p.e.), generating 38.5% of the overall employment and 45% of total value added

# The methodology

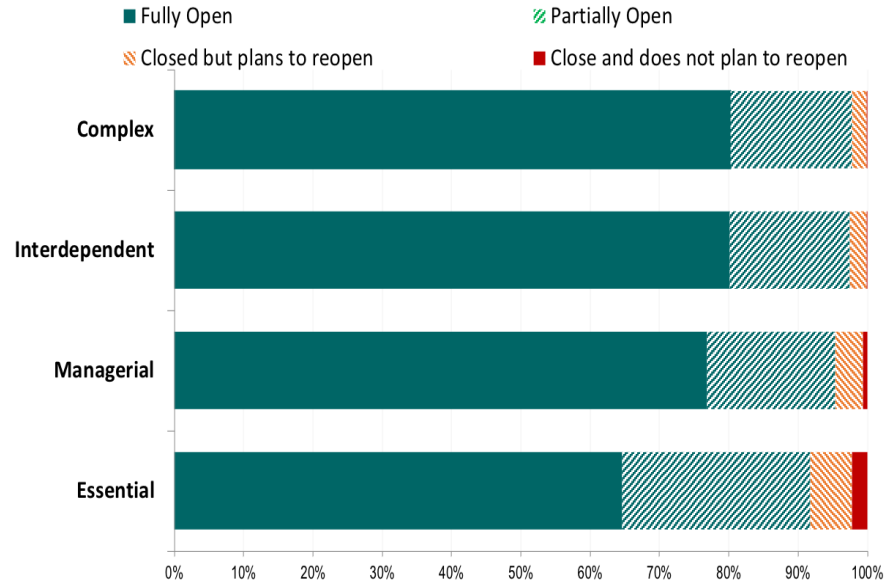
A multivariate, multi-stage analysis:

- ✓ **Factor analysis** on IMCPI  $\Rightarrow$  Seven factors to synthesize IMCPI sections; then three factors characterizing different sets of technological and organizational capabilities
  - ✓ **Cluster analysis** on IMPCI and Frame-sbs  $\Rightarrow$  Four clusters of firms, from less to more complex ones
  - ✓ **Analysis of co-occurrences**  $\Rightarrow$  Identification of the bundle of firm clusters' practices in pre-crisis times (IMCPI) and during pandemic (SPIESC-19)
  - ✓ **Estimates** of how pre-crisis clusters' practices correlates with jobs dynamics in pandemic times (SPIESC-19 + Mandatory communications)
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# Results – Pandemic times - 1

- At the end of 2020  $\approx 80\%$  of Complex and Interdependent firms were fully open again (Essentials:  $\approx 65\%$  )
- Closures were largely declared by Managerial and Essential firms

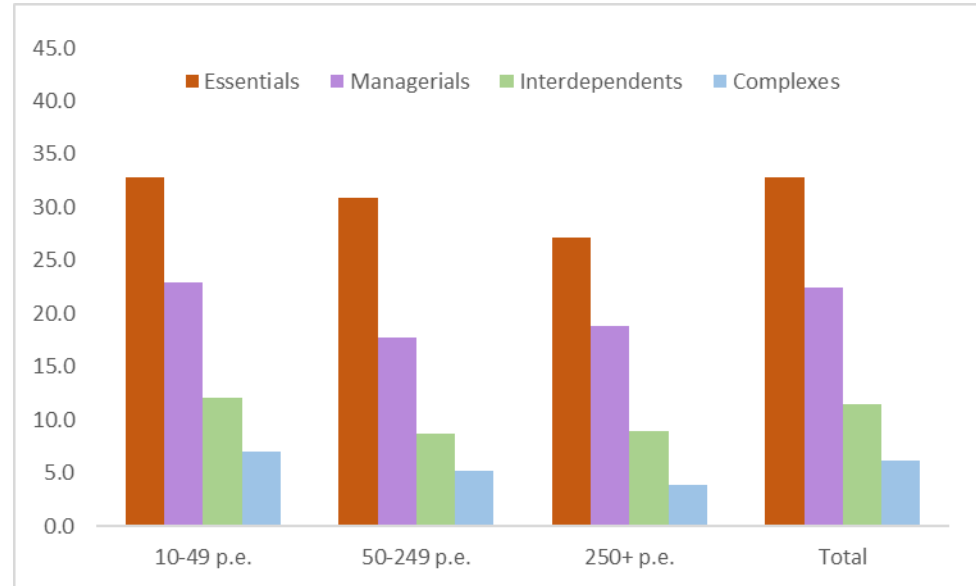
Share of firms by cluster



# Results – Pandemic times - 3

- **Lost in pandemic:** among Essentials, the share of firms unable of developing strategies for reacting to the crisis is 5-7 times higher than the Complexes' one (*incapabilities?*)
- The % of “lost” Essential large firms was higher than that of more complex SMEs
- An analysis of co-occurrences of strategies helps understand why...

% of firms unable to design reactions, by cluster and size class – Dec. 2020



# Co-occurrences of firms' strategies – A look at persistence

## ESSENTIAL

- **Pre-pandemic times** → little (or no) investment activity in digitalization and HR, no policies for process safety, little staff training (mostly on cyber security)
- **Pandemic times** → uncertainty, inability to design reaction strategies, fund raising difficulties, layoffs

Pre-pandemic times



Pandemic times



# Co-occurrences of firms' strategies - A look at persistence

## MANAGERIAL

- **Pre-pandemic times** → Mainly defensive strategies in local markets; low investment rates; no investment in R&D or innovation; no specific HR practices
- **Pandemic times** → No specific HR measures or reaction strategies; hard reorganization of production/activity

### Pre-pandemic times

No Workplace safety policy  
**No R&D investments**  
**No R&D investments**  
No cyber security  
Promotion of external collaborations  
**No innovation projects**  
**Low Investment rates**  
**Defensive strategies in local markets**  
Products and services diversification  
Increase domestic activity  
**No personnel practices**  
**No Attract talent strategy**  
Access to New Markets Strategy  
Localization strategy

### Pandemic times

Use of alternative financing instruments  
**No future strategy**  
**Hard reorganising production**  
**No HR management measures**  
**Difficulty in defining a strategy**  
Activity not affected by Covid-19 emergency  
**No current strategy**  
Radical change in activity type

# Co-occurrences of firms' strategies - A look at persistence

## INTERDEPENDENT

- **Pre-pandemic times** → Propensity to internationalization and R&D ; HR retraining; investment in IT (mostly in project planning software)
- **Pandemic times** → Increased focus on export (mainly in EU); wide use of remote working; increasing adoption of I4.0 business models

Pre-pandemic times



Pandemic times



# Co-occurrences of firms' strategies - A look at persistence

## COMPLEX

- **Pre-pandemic times** → Propensity to invest in R&D and I4.0 technology; HR training in I4.0
- **Pandemic times** → Increased focus on export (both in EU and extra-Eu); Increasing adoption of I4.0 business models; Hiring!

Pre-pandemic times



Pandemic times





# Defining firm hiring and firing strategies

We define four outcomes in order to define firms hiring strategies

1. Employment **expansion** with occupational **upgrading**. Occupational upgrading is defined as a net **increase** in the hiring of top (1,2,3) versus bottom (5,6,7) ISCO occupations by each single firm ( $\Delta\text{skills} > 0$  ,  $\Delta\text{empl} \geq 0$ )
2. Employment **restructuring** with occupational **upgrading** ( $\Delta\text{skills} > 0$  ,  $\Delta\text{empl} < 0$  )
3. Employment **expansion** with occupational **downgrading**. Occupational downgrading is defined as a net **decrease** in the hiring of top (1,2,3) versus bottom (5,6,7) ISCO occupations by each single firm ( $\Delta\text{skills} \leq 0$  ,  $\Delta\text{empl} \geq 0$ )
4. Employment **restructuring** with occupational **downgrading** ( $\Delta\text{skills} \leq 0$  ,  $\Delta\text{empl} < 0$ )

NB: Comunicazioni Obbligatorie are informative of labour force flows, that is new contracts activated/terminated. While activations are a more naturally way to account for firm hiring strategies, firing strategies cannot be directly inferred by the total number of cessations. Therefore it is necessary to account for the motive behind cessations, which might go from retirements, to contract expire.

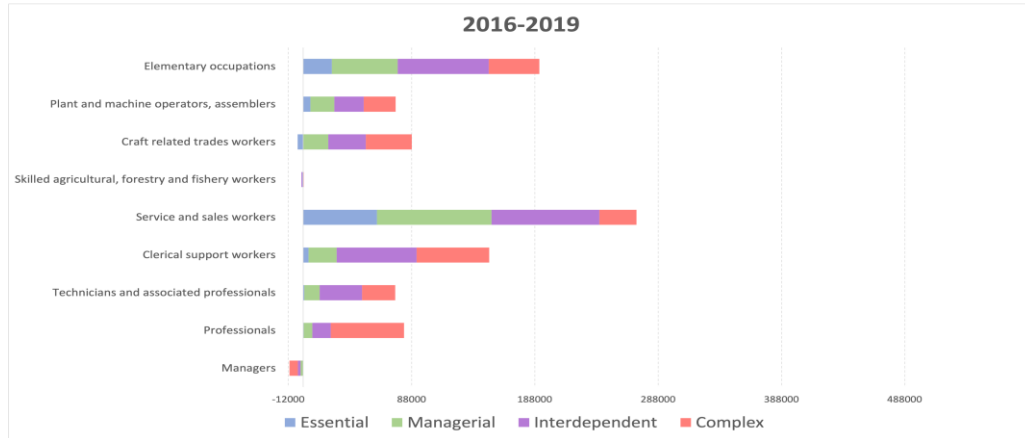
# A look at the quality of employment

We define four outcomes in order to identify firm hiring strategies

1. Employment **expansion** with occupational **upgrading**. Occupational upgrading is defined as a net **increase** in the hiring of top versus bottom ISCO occupations by each single firm ( $\Delta\text{skills} > 0$  ,  $\Delta\text{empl} > 0$  )
2. Employment **restructuring** with occupational **upgrading** ( $\Delta\text{skills} > 0$  ,  $\Delta\text{empl} < 0$  )
3. Employment **expansion** with occupational **downgrading**. Occupational downgrading is defined as a net **decrease** in the hiring of top versus bottom ISCO occupations by each single firm ( $\Delta\text{skills} < 0$  ,  $\Delta\text{empl} > \geq 0$  )
4. Employment **restructuring** with occupational **downgrading** ( $\Delta\text{skills} < 0$  ,  $\Delta\text{empl} < 0$  )

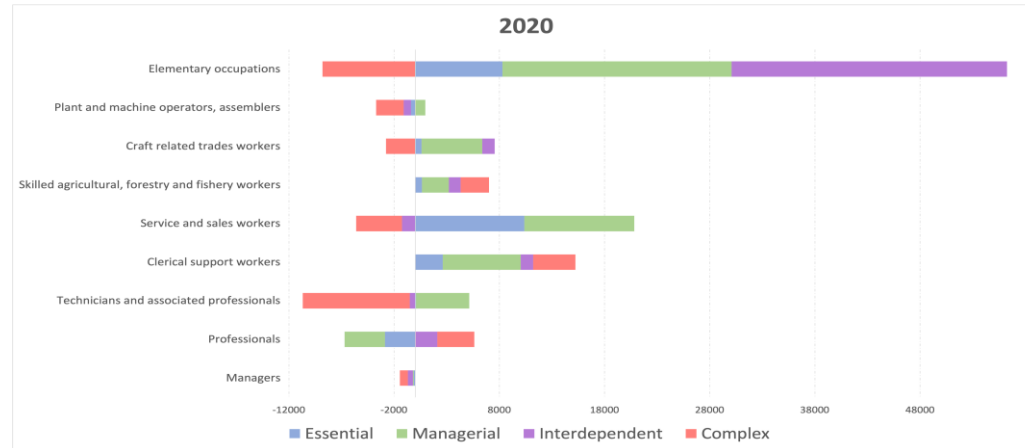
NB: Comunicazioni Obbligatorie are informative of labour force flows, that is new contracts activated/terminated. While activations are a more naturally way to account for firm hiring strategies, firing strategies cannot be directly inferred by the total number of terminations.

# Jobs by occupations and by clusters



## Pre-pandemic times (2016-2019):

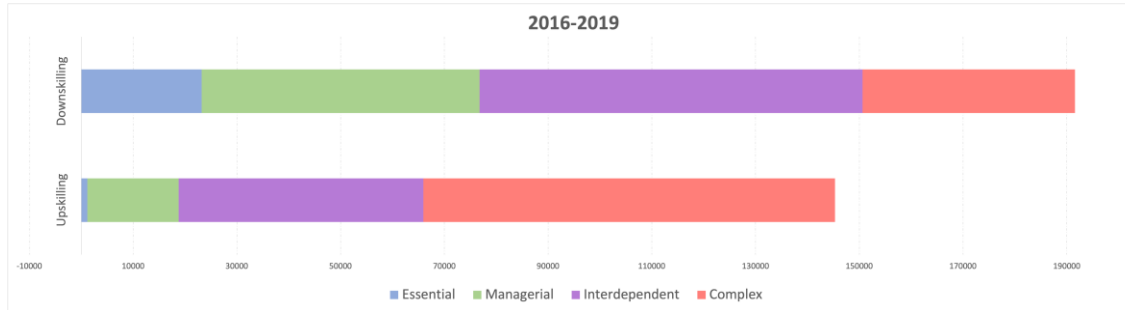
1. The highest incidence of new activated jobs is in service and sales workers;
2. Occupations at the top of the hierarchy are largely demanded by Complex and Interdependent.



## Pandemic times (2020):

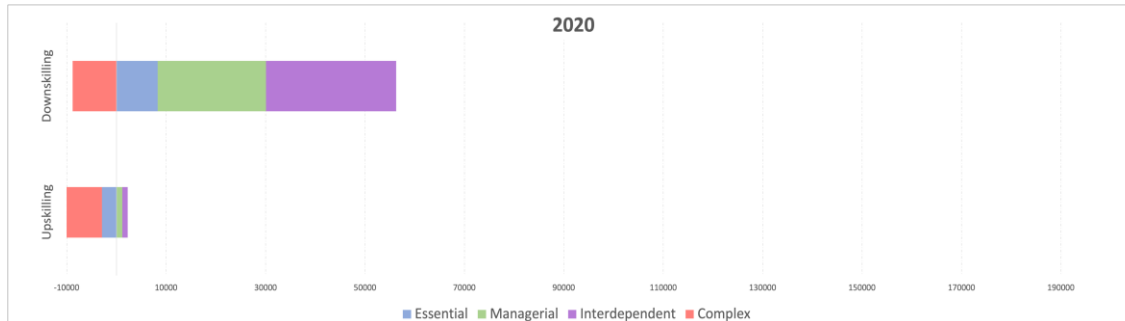
1. Newly activated jobs during the pandemic are largely in elementary occupations and occupations in the bottom part of the hierarchy.
2. Complex firms present more termination than job activation.

# Hiring and firing strategies by clusters



## Pre-pandemic times (2016-2019):

1. Downskilling events more widespread across Italian firms and largely pertains to lower-level clusters;
2. Upskilling events more present in Complex firms



## Pandemic times (2020):

New activations have been recorded in Managerial and Interdependent clusters

# Higher complexity --> better quality in the employment dynamics

Multinomial logit model where:

Dep var. is a variable indicating 4 cases:

1.  $\Delta skills > 0$  ,  $\Delta empl \geq 0$ ;
2.  $\Delta skills > 0$  ,  $\Delta empl < 0$
3.  $\Delta skills < 0$  ,  $\Delta empl \geq 0$
4.  $\Delta skills < 0$  ,  $\Delta empl < 0$ ;

Var. of interest ( $Cl_{k,2018}$ ): vector of dummies referring to the clusters;

Covariates ( $X_{i,2016}$ ): firm-level controls in 2016 (size, productivity, tenure, schooling of employees, firm's age (log), profitability, export/turnover, group belonging, sector, location, reason for contracts termination)

In **2016-2019** (with respect to **Essentials**):

- **Higher complexity** correlates with a higher probability of both qualitative and quantitative employment growth
- ⇒ *Capabilities are reflected in better performance in quantity and quality*

## Contributions to the probability of belonging to a class of performance (p.p.)

**Employment dynamics (2016-19); Benchmark: Essentials; Covariates at 2016; Marginal effects**

Covariates	$\Delta skills > 0$		$\Delta skills \leq 0$	
	$\Delta empl \geq 0$	$\Delta empl < 0$	$\Delta empl \geq 0$	$\Delta empl < 0$
Managerials	0.066 ***	-0.005	0.041 ***	-0.102 ***
Interdependents	0.094 ***	-0.005	0.061 ***	-0.150 ***
Complexes	0.172 ***	-0.028 ***	0.041 ***	-0.186 ***
<i>Additional firm-level covariates/controls</i>	yes			
Observations	10,112			
Pseudo-R2	0.131			

# Higher complexity --> better quality in employment dynamics

- **Pandemic times (2020),**  
*exogenous crisis with strong sectoral dimension.*
- Higher complexity  $\cong$  --> higher share of high-skilled employees
- When employment decreases, lower probability of downskilling

Contributions to the probability of belonging to a class of performance –  
**All business sectors (p.p.)**

	Employment dynamics (2020); Benchmark: Essentials; Clusters at 2018; Marginal effects			
	I	II	III	IV
	$\Delta\text{skills} > 0$	$\Delta\text{skills} > 0$	$\Delta\text{skills} \leq 0$	$\Delta\text{skills} \leq 0$
	$\Delta\text{empl} \geq 0$	$\Delta\text{empl} < 0$	$\Delta\text{empl} \geq 0$	$\Delta\text{empl} < 0$
Managerials	0.039*** -0.014	0.046*** -0.01	-0.054*** -0.016	-0.031* -0.017
Interdependent	0.085*** -0.014	0.029*** -0.009	-0.050*** -0.017	-0.064*** -0.017
Complex	0.096*** -0.016	0.026*** -0.01	-0.069*** -0.019	-0.052*** -0.02
<i>Additional firm-level covariates/controls (2016)</i>			yes	
<i>Observations</i>			7,597	
<i>Pseudo-R2</i>			0.124	

# Conclusions 1

- ✓ By means of a multistep strategy linking **quantitative and qualitative datasets**, we have shown that it is possible to construct an **empirical measure of capabilities of the firms**.
- ✓ We have identified four clusters of firms according to their behavioural attributes ordered by increasing levels of organizational complexity.
- ✓ We have compared organizational capabilities in pre-pandemic and pandemic times showing strong stickiness in behavioural attributes of firms.
- ✓ The pandemic crisis has been an external shock allowing to evaluate **robustness, readiness and vulnerability** of firms.
- ✓ Our clustering exercise and textual content analysis clearly shows that **more complex firms are in general more robust to shocks, ready to react, and less vulnerable**.
- ✓ Notably, the clustering exercise has been conducted on the **IMCPI dating to 2018**, showing the persistence of the reaction responses in 2020, given firm attributes in normal times.

## Conclusions 2

- ✓ We have evaluated firms hiring/firing strategies modulated via their belonging to each of the four clusters.
- ✓ **Complex firms** show higher capabilities not only in managing the organization as such, but also in their impact in **labour markets**.
- ✓ Both in pre and pandemic times this cluster exhibits statistically significant difference in its capacity to absorb **new jobs and in better qualified occupations**
- ✓ When hiring, high complex firms reacted to the pandemic crisis absorbing more at the top rather than at the bottom, **increasing the level of hierarchical power in decision making processes**
- ✓ When hiring, low complex firms reacted to the pandemic crisis absorbing more at the bottom rather than at the top, **increasing the level of subordinate personnel**