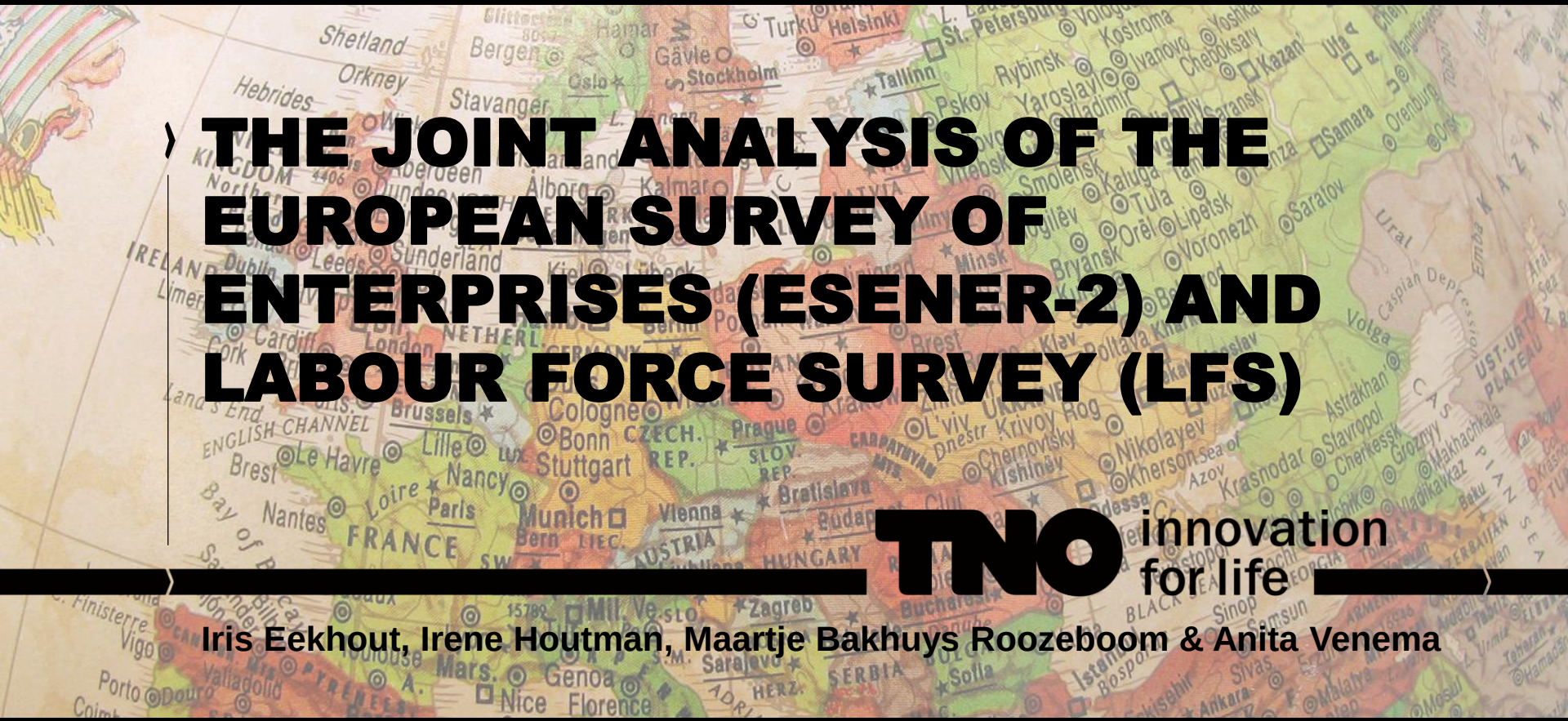

THE JOINT ANALYSIS OF THE EUROPEAN SURVEY OF ENTERPRISES (ESENER-2) AND LABOUR FORCE SURVEY (LFS)

TNO innovation for life

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INTRODUCTION

- Large European databases hold valuable data about occupational safety and health (OSH).
- Mostly only from one information source
  - The Labour force survey ad hoc module 2013 (LFS-13) holds information on **employees** (Module on accidents at work and other work-related health problems)
  - The European survey of enterprises (ESENER-2) holds information on **enterprises**
- Combining information can be feasible to obtain a comprehensive picture

STUDY AIM

Primary aim:

- Evaluating the association between reported occupational risks by **employees** with risk management in **enterprises** for general OSH, musculoskeletal disorders (MSD) and psychosocial risks (PSR)

Secondary aims:

- Evaluating the influence of drivers of successful risk management
- Developing typologies for risk management of specific companies

RISKS AND MANAGEMENT

- **Examples of types of risks (reported by employees)**
  - Loud noises, risk of accidents (OSH)
  - Handling of heavy loads (MSD)
  - Severe time pressure or overload of work (PSR)

- **Examples of management measures (reported by enterprises)**
  - Regular medical examinations (OSH)
  - Equipment to help with the lifting or moving of loads or other physically heavy work (MSD)
  - Action plan on stress, bullying, third party violence (PSR)

TWO PROBLEMS

- 1) Different levels of observation: companies and employees
- 2) Employees are not sampled from the companies represented in the enterprise survey.

APPROACH

- Three common background variables:
  - **Country** (countries included in both surveys)
  - **Sector** (19 NACE categories)
  - **Enterprise size** (small; 1-10 employees, medium; 10-50 employees, large; more than 50 employees)

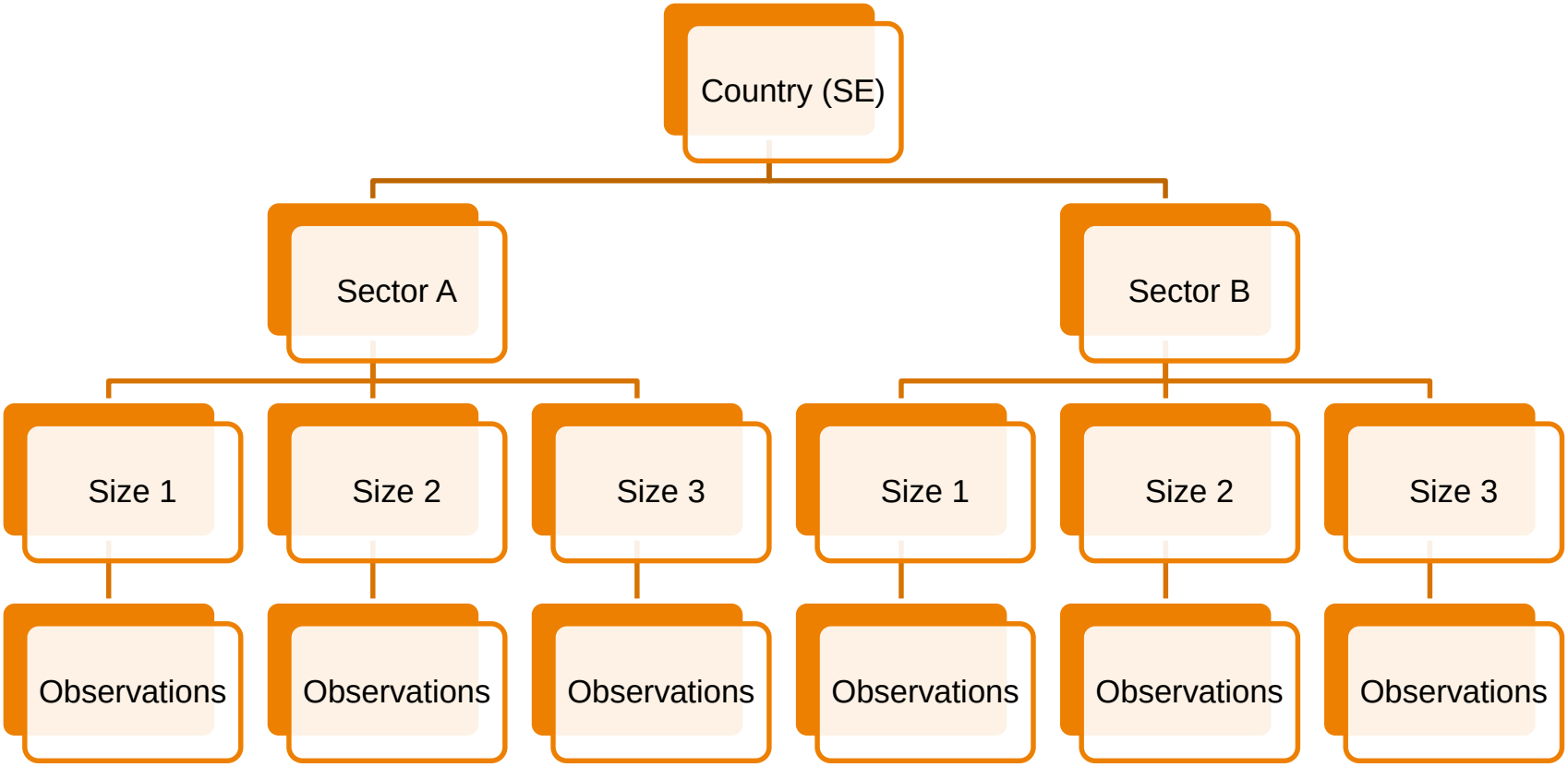
APPROACH

Level	LFS-2013	ESENER-2
Country	x	x
Sector	x	x
Company size	x	x
Enterprise		x
Employee	x	

APPROACH

- Use the variance of the variables, between the categories of these three background variables to jointly analyse the dataset.
- Variance can be obtained via multilevel analyses with the background variables as hierarchical levels in the data.

MULTILEVEL MODEL



MULTILEVEL MODEL

- Multilevel model: generalization of linear regression model for grouped data
- Each level describes the difference between the categories at that level with statistical parameters and relates to the next level

- Example:
  - at country level – the parameters describe how the various countries differ from each other in their OSH risk measures
  - at the sector level – the parameters describe how sectors differ from each other within countries
  - at size level, the parameters describe how differently sized companies differ from each other within sectors, within countries.

EQUATIONS

- For each observed variable in the data (e.g. reported OSH risks by employees) an intercept only model, with random intercepts at each level.

$$Y_{ijkl} = \gamma_{0jkl} + \varepsilon_{ijkl}$$ Observation level

$$\gamma_{0jkl} = \beta_{00kl} + \mathbf{\omega_{jkl}}$$ Size level

$$\beta_{00kl} = \pi_{000l} + \mathbf{\mu_{kl}}$$ Sector level

$$\pi_{000l} = \varphi_{0000} + \mathbf{\tau_{l}}$$ Country level

ANALYSIS OF ASSOCIATIONS

- Association between variances in reported risks and risk management
  - Correlations (at the different levels)

- The impact of drivers of successful risk management was investigated by inspecting interaction effects.
  - Management commitment
  - Formal and informal employee involvement
  - Legal obligations

RESULTS ASSOCIATIONS

- Correlation between **risk management** by enterprises and by employees **reported risks**

	Country level	Sector level	Size level
OSH	-0,17	0	**0,25**
MSD	0,29	**0,43**	0
PSR	0,22	**0,35**	**0,38**

VISUALIZING RESULTS (OSH)

VISUALIZING RESULTS (MSD)

VISUALIZING RESULTS (PSR)

DRIVERS OF SUCCESSFUL RISK MANAGEMENT

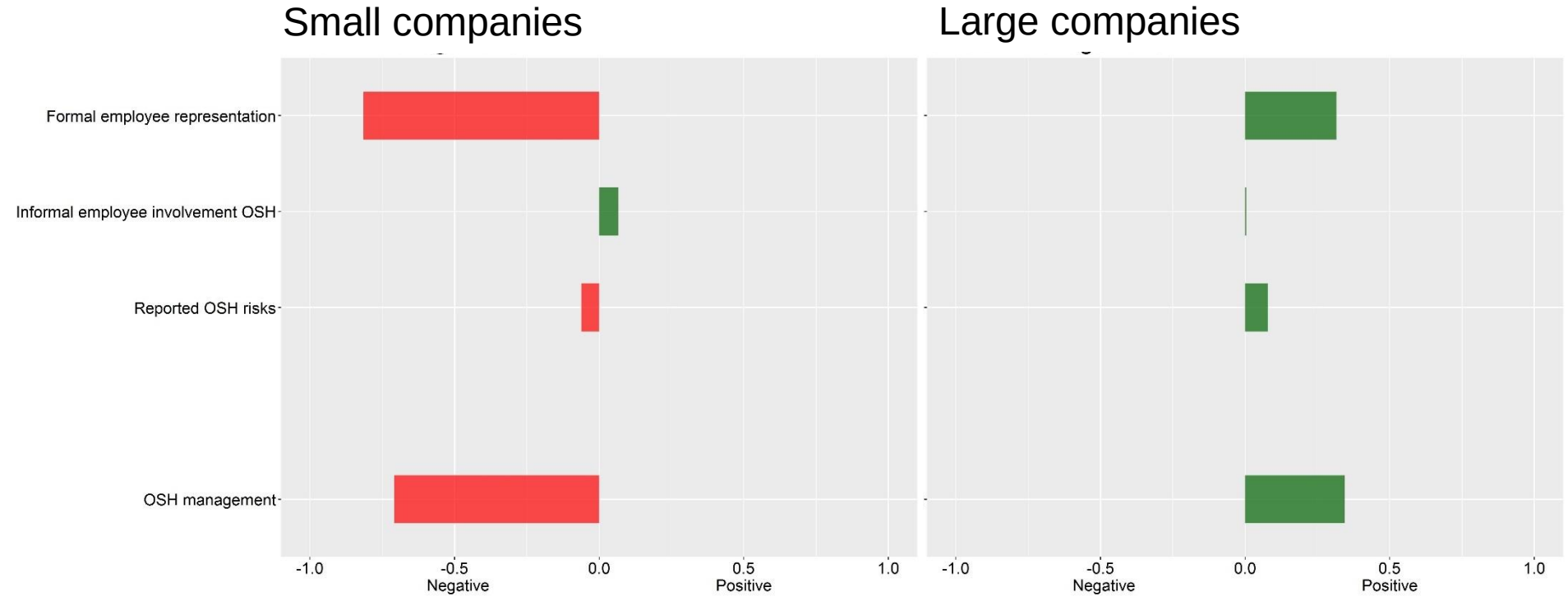
	OSH	MSD	PSR
Management commitment		x	x
Informal employee involvement	x		
Formal employee involvement	x	x	x
Legal obligations			x

CONCLUDING TYPOLOGIES

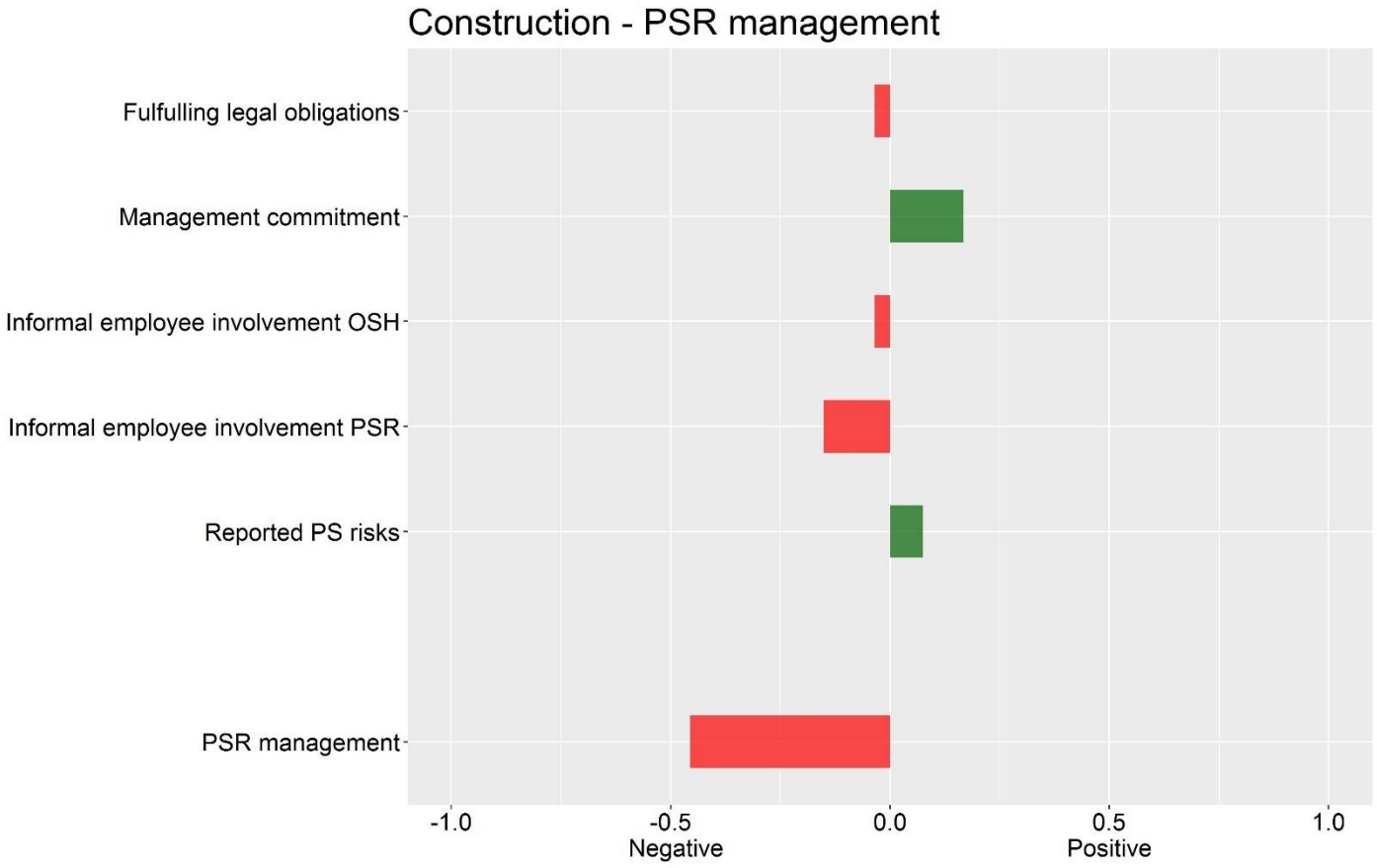
- By evaluating the importance of the drivers we can make typologies for each category of the level variables.
- Can be useful for policy makers to interpret findings

- For example the state of OSH risk management in small and large companies.

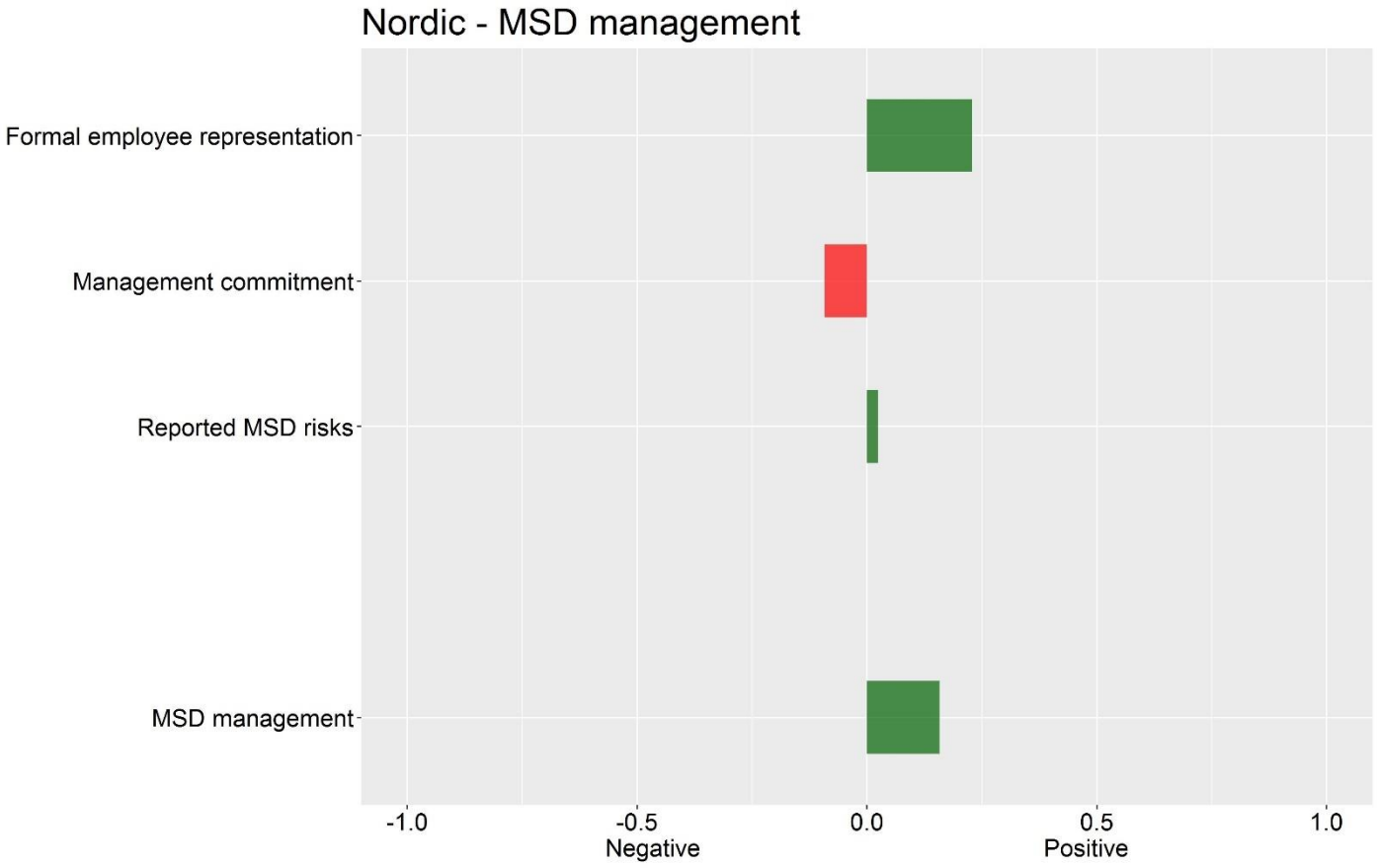
OSH RISK MANAGEMENT IN SMALL AND LARGE COMPANIES



PSR MANAGEMENT IN THE CONSTRUCTION SECTOR



MSD RISK MANAGEMENT IN NORDIC COUNTRIES



CONCLUSIONS

- Jointly analysing data from employees and enterprise representative that do not belong to the same company, can be done.
- However, conclusions need to be taken with care!
  - Conclusions about associations can only be made at the common levels (i.e., counties, sectors, company sizes).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