

# Trading profiles in the EU Emissions Trading System: a latent profile analysis based on transaction behaviour



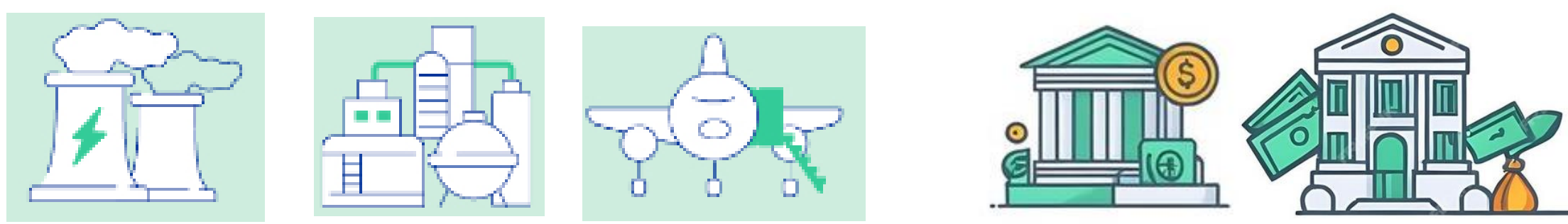
## MOTIVATION

The EU ETS is a key tool for reducing GHG emissions in the EU

- Increased EU carbon price and volume exchanged
- Increased **financialisation** of the EU carbon market
- A **potential detrimental role** played by purely financial actors?  
→ A sector **bias** associated with a specific type of behaviour?

The EU carbon market is characterised by:

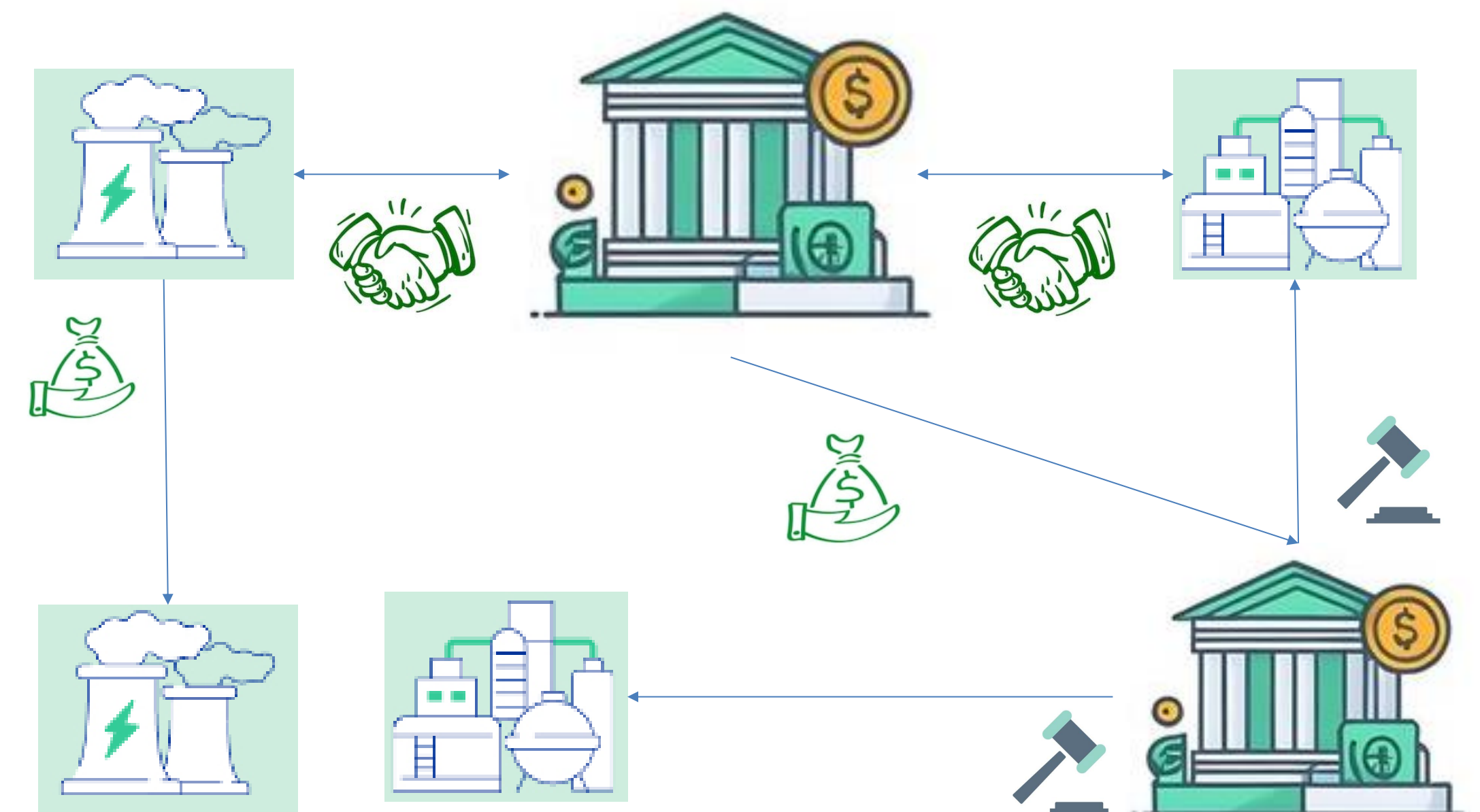
- **Heterogeneity of participants:**  
compliance actors, financial actors



- **Different markets and contracts:**  
auctions, spot, derivatives



Simplified representation of trading network\*:



\*including 2 representative banks, energy companies & industrials

## RESEARCH QUESTIONS

- What are the **different categories of actors** in the EU ETS?
- What **characteristics explain** how firms behave?

## METHODOLOGY

- Categorisation of firms based on their **network properties**  
→ Degree, relative strength, centrality measures (harmonic closeness, betweenness, hubs)
- A **model-based** profiling of firms (LPA) ensuring there is no a **priori bias**  
→ BCH 3-steps estimation method using Mplus

## DATA

- EU ETS transactions (EU transaction log), firm-level ETS (JRC match), firm information (Orbis)
- Data transformation to identify transfer types (auctions vs derivatives), inter/intra firm transfers  
→ mapping of the **2018 transaction network** at the national firm level

## KEY RESULTS

- **3 trading profiles emerge**, with 1 profile standing out as a net seller, selling to relatively fewer firms
- Non-compliance firms are mainly found in that outlier profile  
→ **non-compliance firms behave similarly**
- No clear-cut sectoral distribution across profiles  
→ the **sectoral a priori bias** is not verified

## RELATED LITERATURE

- Betz, R. A., & Schmidt, T. S. (2016). Transfer patterns in Phase I of the EU Emissions Trading System: a first reality check based on cluster analysis. *Climate Policy*.
- Borghesi, S., & Flori, A. (2018). EU ETS facets in the net: Structure and evolution of the EU ETS network. *Energy Economics*.
- Freeman, L. C. (1978). Centrality in Social Networks Conceptual Clarification. *Social Networks*.
- Quemin, S., & Pahle, M. (2023). Financials threaten to undermine the functioning of emissions markets. *Nature Climate Change*.

## ACADEMIC SUPERVISOR

Marc BAUDRY (Université Paris Nanterre, Climate Economics Chair)

## AUTHOR

Marie RAUDE

## CONTACT

raude.marie@gmail.com

## AFFILIATIONS

Chaire Économie du Climat, Palais Brongniart.  
EconomiX, Université Paris Nanterre.  
FSR, European University Institute.