Economic and Labour Market Impacts of Migration in Austria: An Agent-Based Modeling Approach

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Role of migration in Austrian economy

1. 📊 Critical economic dependency

- 24.8% of Austrian workforce is foreign-born
- Since 2021: All workforce expansion driven by foreign workers
- Key sectors show 50-57% foreign worker concentration

2. ⚖️ Integration performance varies significantly

- EU nationals: High activity rates (86.8% men, 76.9% women)
- Refugee populations: Lower integration (71.9% men, 50.8% women)
- Unemployment disparities: 4-5% (Germans/Austrians) vs 35-45% (Syrians)

3. 🎯 Policy response

- RWR Card system expanded: 4,402 cards (2023) → 15,000 target (2027)
- Shortage occupations increased 144%: 45 (2019) → 110 (2024)
- Focus on high-value sectors: IT, healthcare, engineering

4. 💡 Implications

- Austria's economic competitiveness increasingly depends on migration
- Labour shortages drive policy liberalization despite political tensions
- Need for improved integration pathways to maximize economic benefits

Sources: Skrivanek (2025), Hadj Abdou & Ebner (2024)

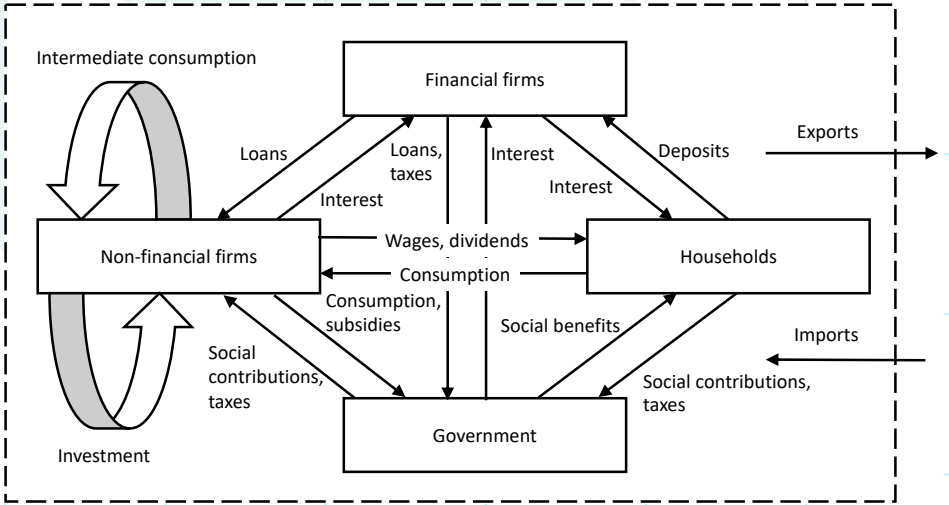
Need to study economic impacts of migration

- In Europe, **large migratory shocks** have led to a heated political debate on their management
- Uncertainty about the **migratory impact on the economy and society** has polarized the debate
- There is a **need for tools** to inform stakeholders and policymakers of the economic and consequences of migration

- Investigation of the **macroeconomic impacts** (GDP, government debt, unemployment rate, etc.) of an extreme **migration scenario** for **Austria**
- Consider **social heterogeneity** (e.g., by economic sector and socioeconomic status) to allow studying **distributional impacts**
- Make use of **detailed microdata**

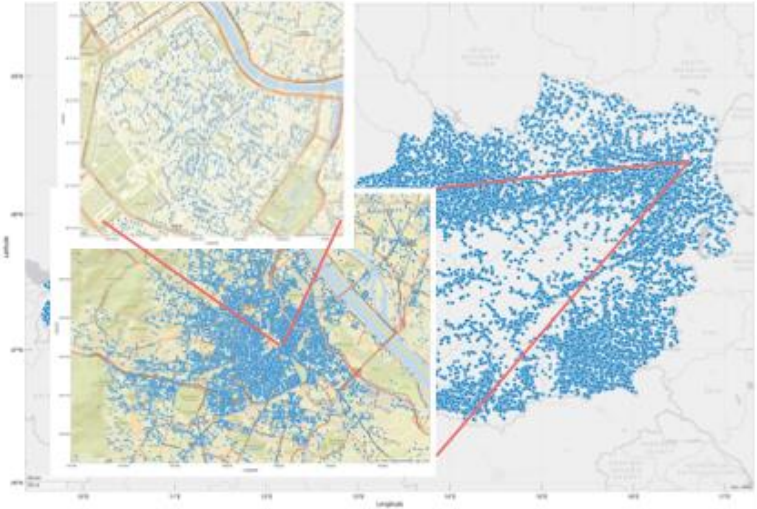
IIASA macroeconomic agent-based model

- **Explicit sector detail** and **millions of interacting agents**;
- Intersectoral **input-output** and **financial linkages**;
- Parameters are calibrated with **micro-** and **macroeconomic data**;
- Validated by comparing its **out-of-sample forecast performance** with that of econometric and DSGE models



Calibration of the ABM for Austria

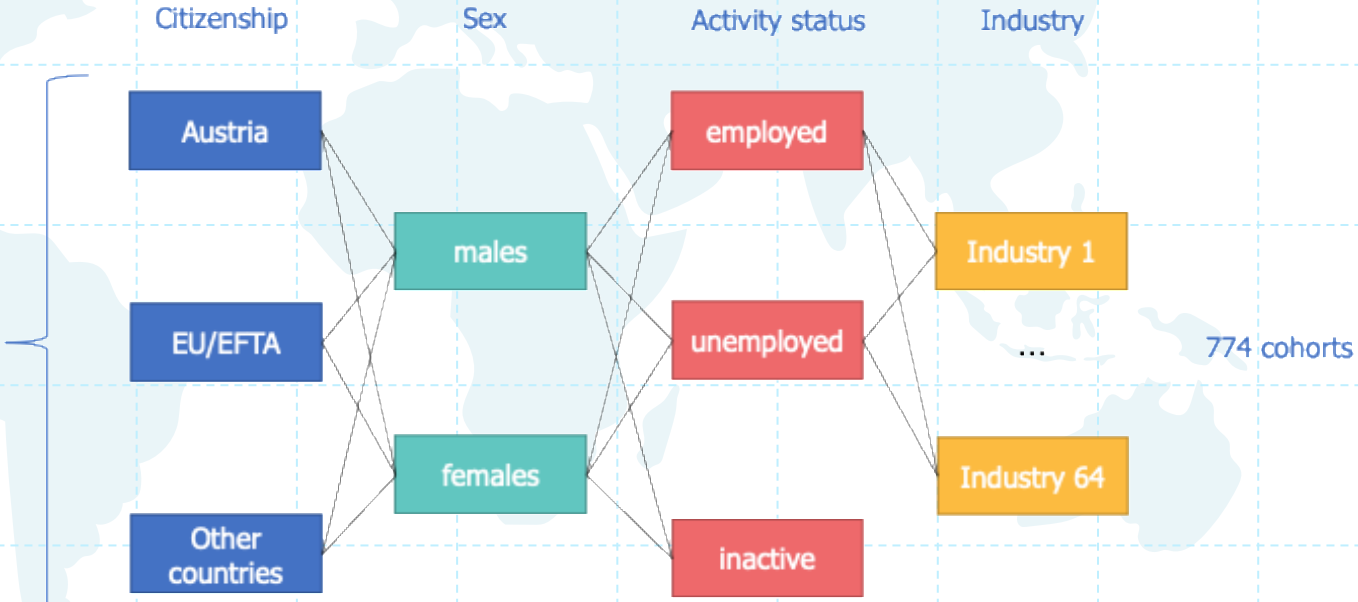
Data type	Data purpose
Census and business demography	Populate the model with realistic numbers of **agents-individuals** and **agents-firms**
Input-output *industry* × *industry* tables (IOTs); all economic activities as classified by the European System of Accounts: 64 industries (NACE-level 2)	Describe the sale and purchase relationships between producers and consumers within an economy, i.e., **flows of final and intermediate goods and services**
Government statistics and sector accounts	Calibrate tax rates, social insurance rates, etc.
National accounts (GDP and main components) and money market interest rates	Estimate exogenous processes and the Taylor rule to determine the policy rate
Statutory guidelines, financial regulation, and banking practices	Determine capital requirements, inflation targets, unemployment benefit replacement rate, etc.



611,278 firms

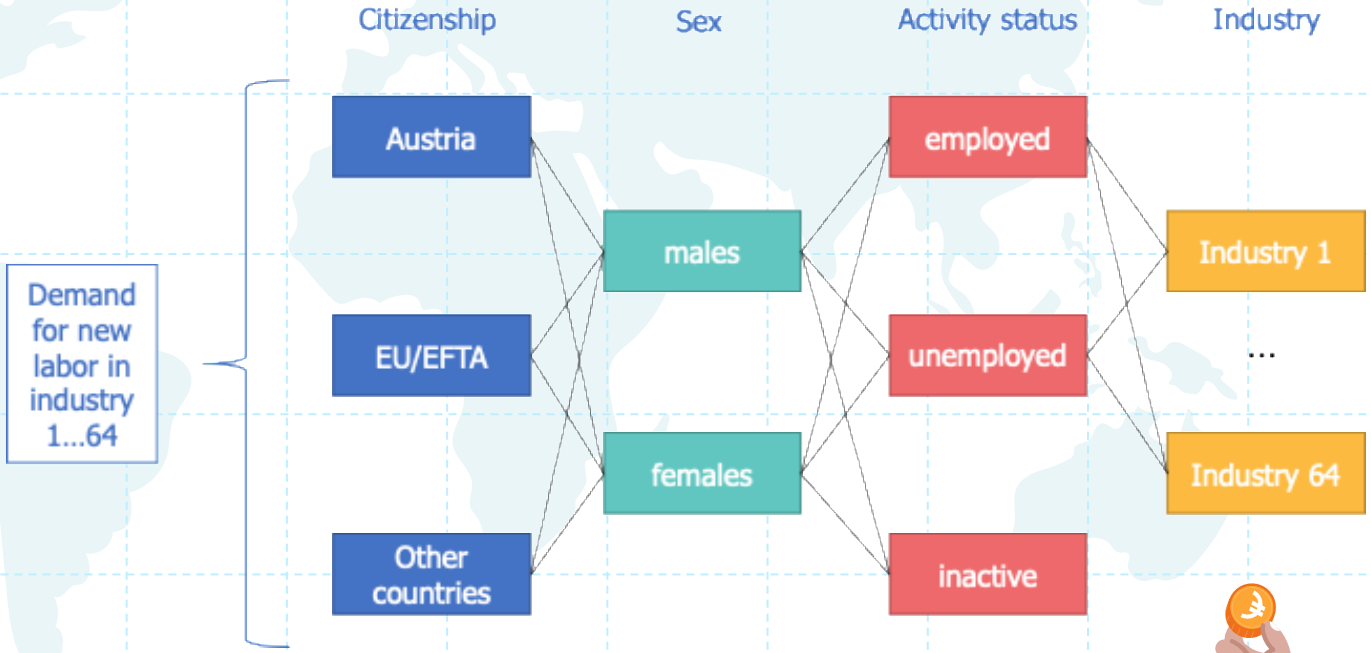
Calibration of the ABM population module

Working age population
(15+ years old)
~7M agents



Calibration of labour market transitions

Labour market transitions to employment are guided by transition probabilities estimated from flows of individuals between the activity states (employed, unemployed, inactive) divided by stocks of individuals in each activity state



Data source: Statistics Austria, Register-based Labour Market Career (ERV)
Data on the employment history of each person in Austria from 2009 onwards (~4.1 mln. employees; ~20 mln. employment relationships)

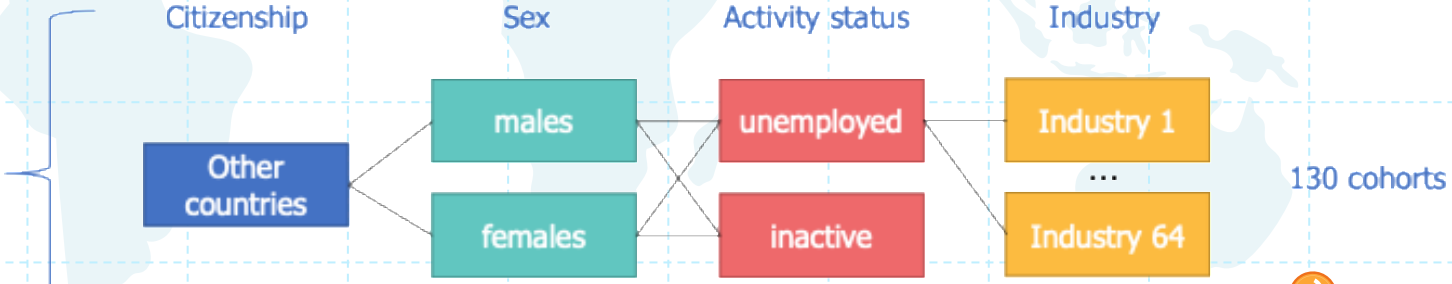
Migration scenario

- Extreme yet still **realistic migration scenario** (similar to the 2015 Syrian refugee crisis, ~250k migrants in two years)
- Our focus is on **macroeconomic impacts** and detailed **labour market dynamics**

Calibration of the migration scenario

- **Migration scenario**: 250,000 additional agents-migrants of working age (15-64 years old) are dynamically added to the ABM every quarter for six quarters.
- The numbers of agents-migrants with certain attributes (citizenship, sex, activity status, and industry) are calibrated to resemble the composition of the 2015 refugee crisis in Austria.

Migration influx
(15-64 years old)
Quarter 1: ~22k agents
Quarter 2: ~39k agents
Quarter 3: ~63k agents
Quarter 4: ~70k agents
Quarter 5: ~31k agents
Quarter 6: ~24k agents



Data sources: JRC migration scenarios, Statistics Austria, UNHCR, Online-Arbeitsmarktinformationssystem

Simulation setup

- Demographics based on 2015 refugee composition
- 5-year simulation period (quarterly time steps)
- Immediate labour market access assumption
- Government provides social transfers during integration

Macroeconomic impact of migration

📈 Total Economic Output (GDP)

- +0.5 p.p. boost in Year 2
- Driven by increased consumption
- Returns to baseline growth after 3 years

📊 GDP per capita

- -2% drop initially
- Gradual recovery over 5 years
- Does not fully return to baseline

Fiscal impact

- Government debt increases by 1 p.p. of GDP
- Economic multiplier effects reduce the burden by 30%
- Manageable within Austria's fiscal framework

Labour market impact

Overall unemployment: 6.6% ➜ 9.1% (+2.5 p.p.)

Who bears the burden? The impact varies dramatically:

By gender:

- Men face larger unemployment increases than women
- Especially pronounced among non-EU migrants

By citizenship:

- Austrian natives: least affected
- EU citizens: moderate impact
- Non-EU citizens: most affected

Most affected group: Male non-EU citizens (+1.36 p.p.)

Industry analysis

Unemployment rate dynamics by industry (Year 5):

Highest impact

Administrative Services: +7.22 p.p.
Hospitality & Food Services: +6.49 p.p.
Agriculture & Forestry: +4.55 p.p.

Moderate impact

Healthcare (+2.39 p.p.)
Most other industries (<2 p.p.)

Positive impact

Financial Services (-0.03 p.p.)

Policy implications

Targeted support strategies

1. Industry-focused integration programs

- Priority support for hospitality and administrative sectors
- Skills recognition programs to reduce qualification barriers

2. Gender-sensitive integration policies

- Enhanced support programs for male migrants
- Address higher unemployment vulnerability among men

3. Economic resilience strategy

- Austria's economy can absorb migration shocks
- Short-term costs manageable, long-term benefits

Conclusions

✅ Austria's economic resilience to immigration

- Austria can successfully absorb large migration flows
- Positive overall economic growth despite short-term challenges

📊 Heterogeneous impacts

- Men and non-EU citizens face greater unemployment risk
- Hospitality and administrative sectors need targeted support

🎯 Policy precision enabled

- Evidence for targeted rather than one-size-fits-all policies
- Tool for evaluating future migration scenarios

Why ABMs for migration policy

Beyond traditional economic models:

🎯 Precision

Identify exactly which groups are affected

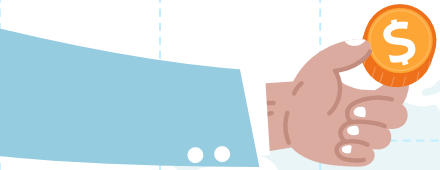
⚡ Real-Time

Can simulate policy changes before implementation

🌍 Scalable

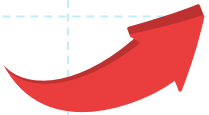
Adaptable to different migration scenarios and countries

"Migration as Economic Reality" requires tools that capture the complexity of economic reality



Thank you

Paper in Comparative Migration Studies



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