The Costs of Exclusion: Refugee Camps and Local Labour Markets

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Introduction

- Refugee inflows can **boost or depress** local employment and wages (Borjas and Monras 2017; Clemens and Hunt 2019).
- Effects depend on **institutional context**, refugee characteristics, and local market structures (Brell, Dustmann, and Preston 2020; Dustmann et al. 2017).
- The 2015 Greek refugee crisis provides a **quasi-natural experiment**:
  - Refugees surged to Eastern Aegean and Dodecanese islands (850,000 in 2015, United Nations High Commissioner for Refugees 2015).
  - Reception camps concentrated arrivals and limited interaction with host communities.
  - Camps often exceeded capacity, putting pressure on local infrastructure (Fabbe, Kyrkopoulou, and Vidali 2022).

Research Question

Main Question

How do refugee inflows affect local labour markets (islands)?

- **Potential positive effects:** increased local demand may raise employment and wages.
- **Potential negative effects:** market disruptions, especially in tourism-dependent sectors.
- Sector-specific focus:
  - **Accommodation & food services:** highly sensitive to tourist flows and refugee-induced demand changes.
  - **Other sectors:** effects may be short-term or more persistent, depending on whether local firms capture refugee-related demand (e.g., catering) or it is supplied by mainland firms.
- Empirical leverage: **quasi-random camp placement** across islands.

Preview of the results

- Refugee camps caused **persistent declines** in days worked and labour earnings.
- Effects concentrated in **accommodation and food services** due to fewer tourists.
- Non-base pay (bonuses, overtime) dropped; base pay less affected.
- **Other sectors** saw only temporary pay increases, dissipating as catering shifted to mainland firms.
- Part-time employment rose: **intensive margin adjustments**.
- Policy and institutional context crucial in shaping the local economic impact.

Context/institutions

Refugee Arrivals and Reception Capacities (2015)

Island	Refugee Arrivals	Arrivals per 100 inhabitants	Total Reception Capacity
Lesvos	95,902	136	3,020
Kos	30,990	98	300
Chios	30,625	65	2,250
Samos	19,579	88	630
Leros	10,684	142	330

Source: UNHCR reports (2015-2016); UNHCR Operational Data Portal (`https://data.unhcr.org/`). Arrivals refer to registered refugees from January–August 2015. Arrivals per 100 inhabitants are based on September 2015 population estimates. Reception capacities are camp capacities as of January 2016.

Refugee Employment Restrictions in Greek Islands

- Refugees in Aegean island camps had **very limited legal rights to work**.
- Most asylum seekers **lacked work permits** and could not access the formal labor market.
- Camps imposed **mobility restrictions**, limiting ability to leave for employment.

Data and identification

Data

- **Source:** Greek Social Security Institute (EFKA), 2011–2019; links individual workers to employers, sector and location information.
- **Coverage:** Universe of private sector employees; allows analysis of **small islands** that are typically underrepresented in surveys.
- **Labour outcomes:**
  - Total earnings broken into base and non-base pay (bonuses, overtime, allowances).
  - Days worked, full-time vs. part-time status.
  - Occupation skill levels (low, medium, high) and sector classification.

Identification Strategy: Overview

- Exploit **localised refugee camp placement (2015)** as a quasi-natural experiment.
- **Average Treatment Effect (ATE) design**: measure average impact of camp placement on local labour market outcomes.
- Compare **treated islands** (Eastern Aegean Dodecanese) to **control islands** (Cyclades) before/after 2015.
- Event-study design assesses dynamic effects and tests for **pre-trends**.

Exogeneity of the Treatment

- Camps located on islands near Turkish coast based on **geography and port accessibility**, not local labor conditions.
- Placement coordinated centrally by **Greek Ministry of Migration, EU, and UNHCR**.
- **Sharp geographic discontinuity** in exposure between treated and control islands.
- **Donut-style** design: exclude nearby islands without camps to avoid spillovers.

Treated and control groups

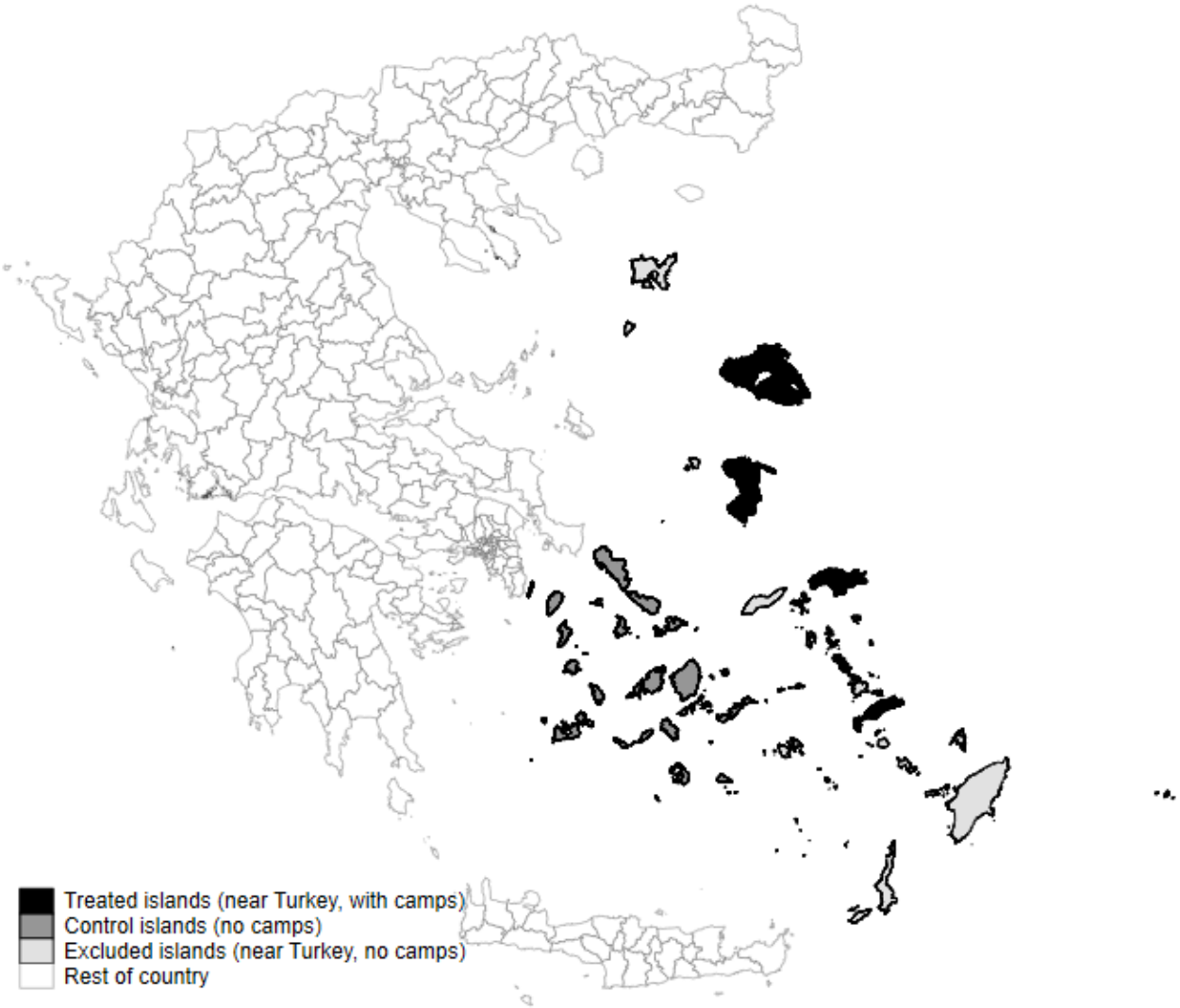


Figure: Treated and control groups

Descriptive Statistics by Treatment Status

	Control [1]	Treated [2]	Total [3]
Female	0.49	0.51	0.49
Greek citizenship	0.75	0.81	0.78
Age (years)	35.17	35.94	35.54
	(10.65)	(11.12)	(10.88)
Part-time worker	0.28	0.34	0.31
Accommodation & food services sector	0.57	0.51	0.54
Total pay (including zeros)	4967.73	5390.78	5171.09
	(5961.82)	(6400.00)	(6180.90)
Basic pay (full-time)	4794.01	5629.73	5176.75
	(5251.39)	(6097.73)	(5669.99)
Basic pay (part-time)	1744.73	2161.36	1953.70
	(2101.21)	(2401.75)	(2266.52)
Days worked (full-time)	87.61	95.57	91.43
	(90.45)	(101.74)	(96.12)
Days worked (part-time)	28.62	37.38	32.83
	(59.08)	(71.25)	(65.36)
Number of workers	42,633	39,463	82,096
Number of firms	8,083	6,669	14,752

Notes: Descriptive statistics refer to 2014, the baseline year before the construction of refugee camps. The sample covers private sector employees on treated islands (Lesbos, Samos, Chios, Leros, and Kos) and control islands (Cyclades).

Treatment Definition & Event-Study Model

- **Treatment:** island hosts a refugee camp (binary indicator).
- **Outcome:** log total annual earnings and days worked.
- **Worker-level event-study:**

$$Y_{ijt} = \sum_{s \neq 2014} \delta_s \left(\text{Treat}_j \times \mathbf{1}\{t = s\} \right) + \alpha_i + \gamma_j + \rho_r + \beta_1 \text{Age}_{it} + \beta_2 \text{Age}_{it}^2 + \epsilon_{ijt}$$

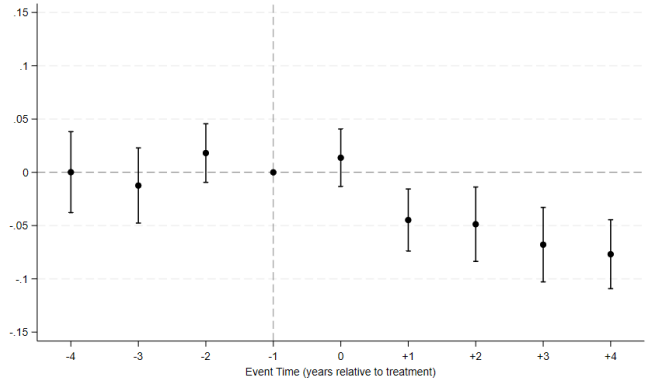
- δ_s tracks yearly treatment effects relative to control; pre-2015 tests parallel trends.
- Worker sector and occupation fixed to 2014 for heterogeneity analysis.

Robustness & Threats to Identification

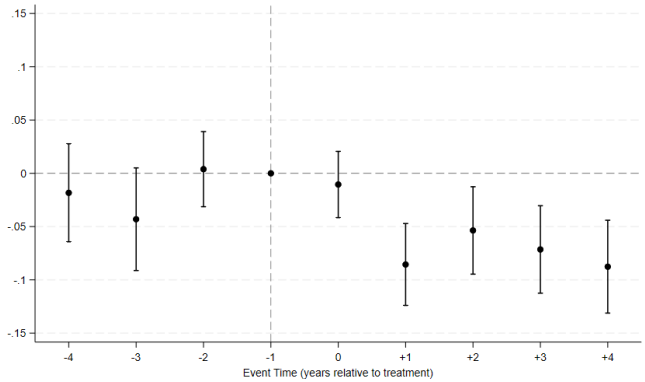
- **Tourism spillovers:** exclude high-tourism islands (e.g., Santorini, Mykonos); use Ionian Islands as alternative control.
- **Regional shocks:** placebo tests with islands that did not host camps.
- **Cross-island interference (SUTVA):** minimal, as islands are largely self-contained labor markets.
- Overall: design isolates **local labor market effect of refugee camp presence**.

Results

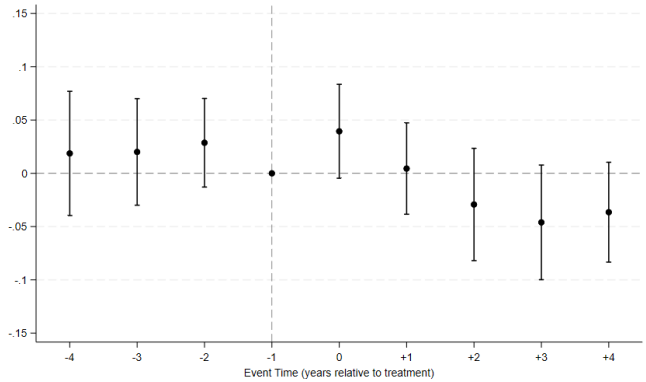
Effect of the presence of refugee camps on **log total annual earnings** across sectors



all sectors



food and accommodation sector



all other sectors

Effects on Earnings

- **All sectors:**
  - Total annual earnings decline on treated islands after 2015.
- **Accommodation & food services:**
  - Largest and persistent drop in total earnings.
- **Other sectors:**
  - Short-term increase in 2015 likely due to temporary demand surge.
  - Effects quickly dissipate as catering and procurement shift to mainland suppliers.

Catering Firms for Refugee Camps

- Firms that won refugee camp catering contracts in 2016 were **located outside the treated islands**.
- Main headquarters / production locations:
  - Corinth
  - Ioannina
  - Viotia
- No major local catering firms on the islands were contracted.

Quantification

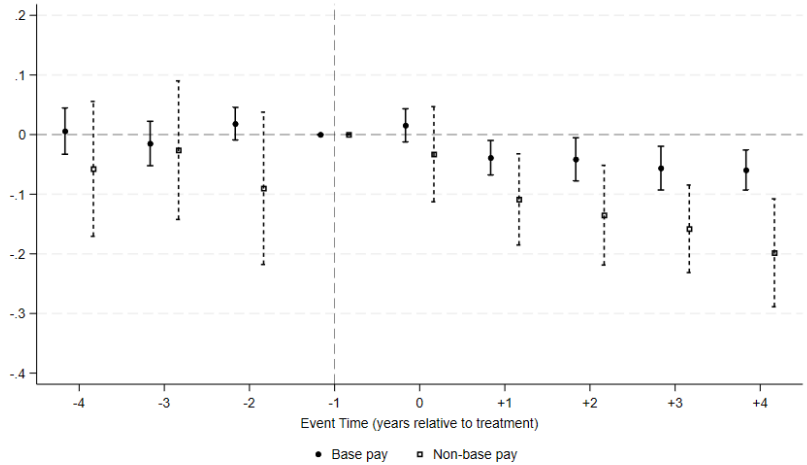
- **All sectors on Greek islands:**
  - Workers' earnings on treated islands 5% lower (€270/year relative to 2014 baseline).
  - Cumulative four-year loss: €1,100 per worker.
- **Accommodation & food services:** large and persistent losses.
- **Other sectors:** no significant long-term change in earnings.

Contrast with Settings Where Refugees Could Work

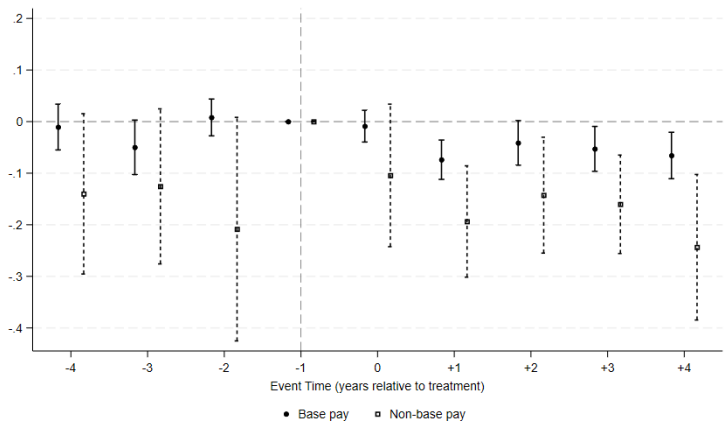
- **Jordan (Syrian refugees):** work permits allowed; positive labour-market effects (Fallah, Krafft, and Wahba 2019).
- **Turkey (Syrian refugees):** allowed to work; impacts on firms and tasks documented (Akgündüz and Torun 2020; Akgündüz, Bağır, et al. 2023).
- **Germany and other EU contexts:** refugee participation increased employment and earnings (Gallegos Torres and Sommerfeld 2025; Glitz et al. 2023).
- **Greek Aegean islands:** refugees confined to camps; negative effects concentrated in tourism-dependent sectors.

- **Key insight:** access to labour markets critically shapes the local economic impact of refugee inflows.

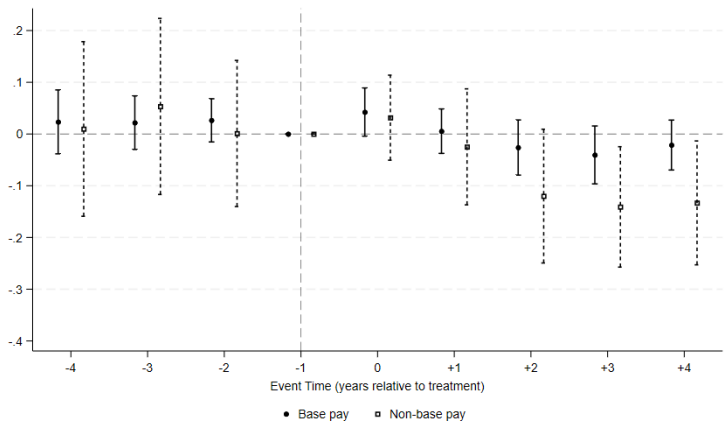
Effect of the presence of refugee camps on **log annual base pay and non-base pay**



all sectors



food and accommodation sector

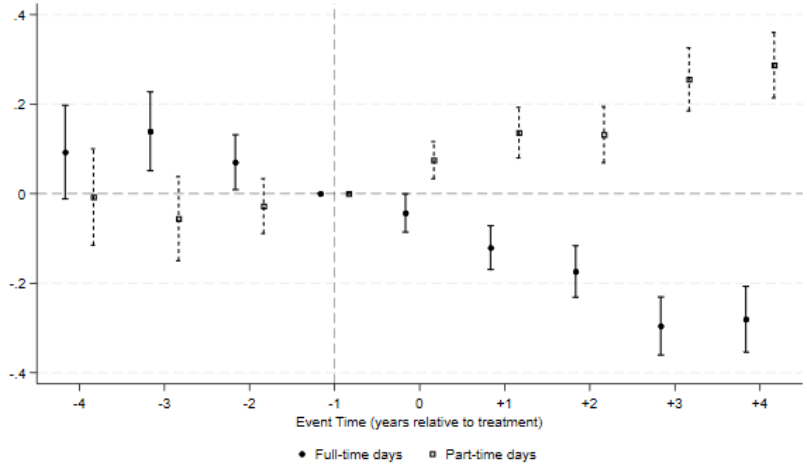


all other sectors

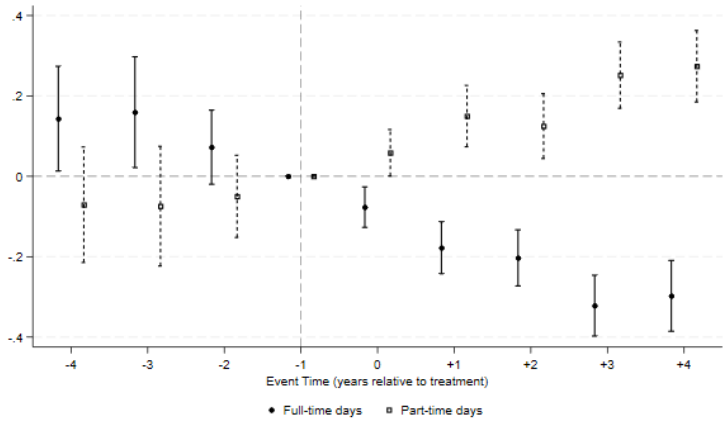
Earnings by Pay Component

- **Non-base pay (bonuses, overtime, allowances):** main driver of total earnings decline.
- **Base pay:** relatively stable, except in accommodation & food services where both base and non-base pay decline.
- **Other sectors:** short-run increase in base and non-base pay in 2015; dissipates quickly as catering shifts to mainland suppliers.

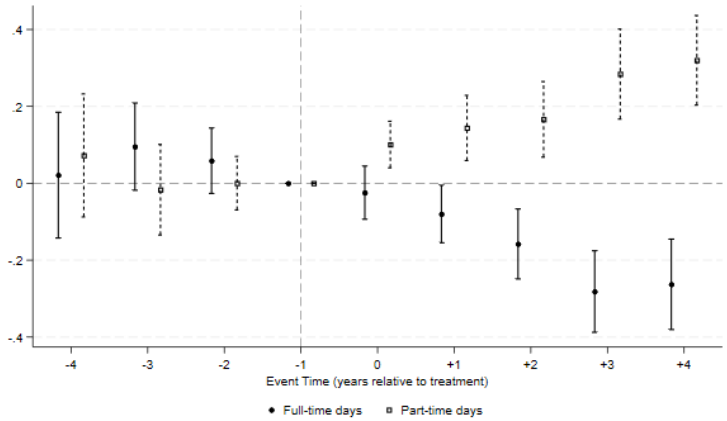
Effect of the presence of refugee camps on **log total annual days worked full time vs part time**



all sectors



food and accommodation sector



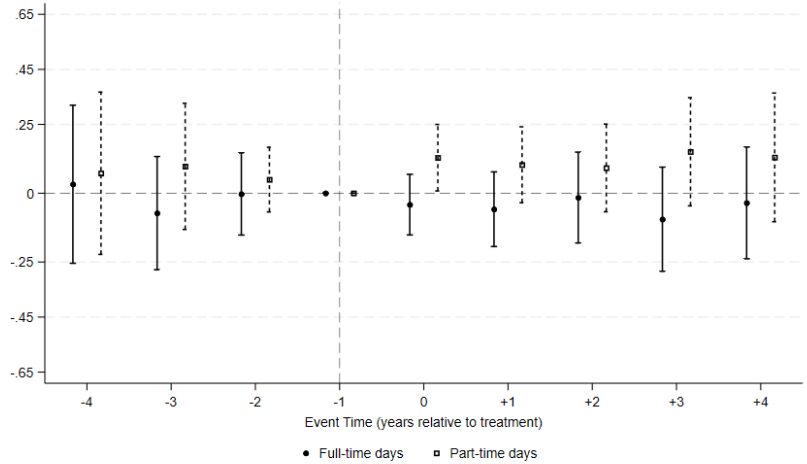
all other sectors

Days Worked by Employment Type

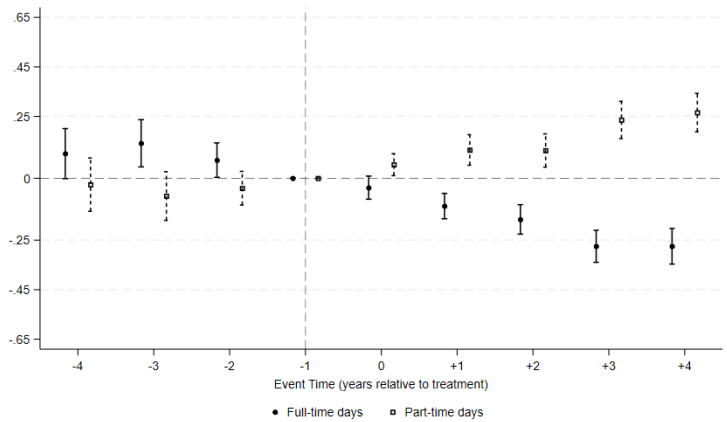
- **Full-time workers:**
  - Significant decline in total annual days worked on treated islands after 2015.
  - Driven by reduced demand in tourism-dependent sectors.
- **Part-time workers:**
  - Persistent increase in total annual days worked.
  - Reflects adjustments along the intensive margin in response to changing demand.
- Overall, **full-time reductions dominate**, but rising part-time work partially offsets the decline.

Heterogeneity

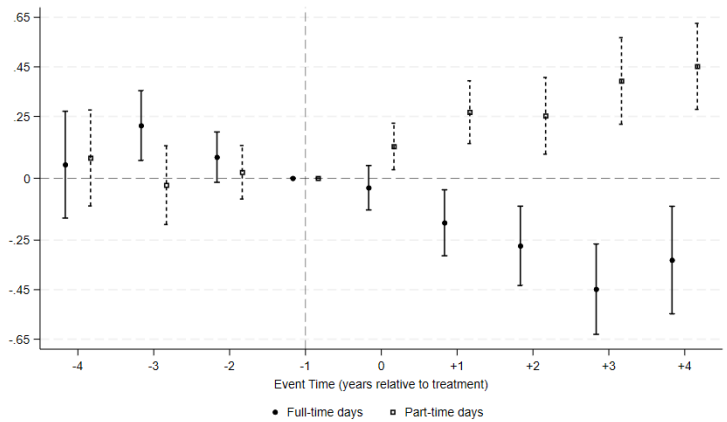
Effect of the presence of refugee camps on **log total annual days worked** by skill group



high-skilled workers



medium-skilled workers



low-skilled workers

Days Worked and Skill Heterogeneity

- **Full-time days worked:** decline after 2015; e.g., 2016: -12 days relative to 2014 mean.
- **Part-time days worked:** increase (+5 days), partially offsetting full-time reduction.
- **By skill:**
  - Declines concentrated among low-skilled workers.
  - Medium-skilled: smaller decrease.
  - High-skilled: no significant effect.
- **Interpretation:** effects driven by reduced demand in tourism-dependent sectors and sectoral disruptions, not direct labour supply competition.

Robustness

Alternative Control and Placebo

Refugee arrivals may have altered tourist flows.

- **Alternative control group**
  - Ionian islands (geographically distant, unaffected)
  - Mitigates spillovers from treated islands

Effects may be driven by broader regional shocks.

- **Placebo treated groups**
  - Ionian islands
  - Crete

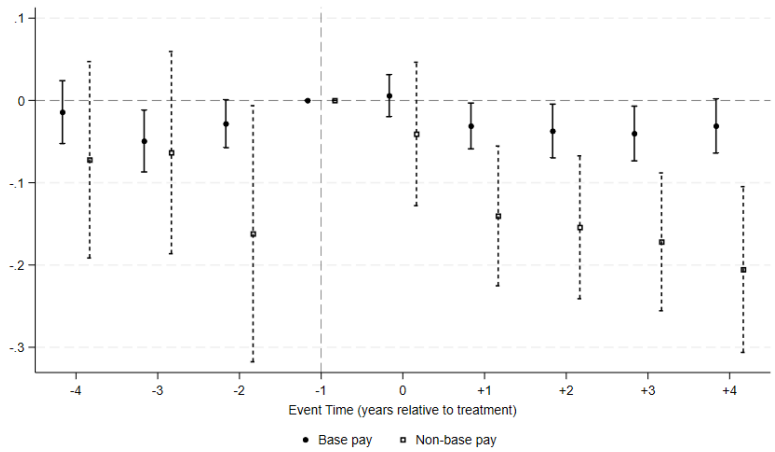
Map

Descriptive Statistics (Alternative Control)

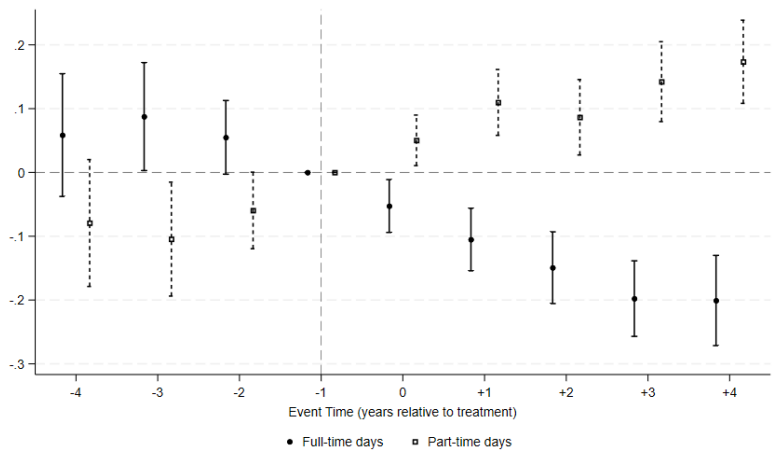
	Alternative Control [1]	Treated [2]	Total [3]
Female	0.54	0.51	0.53
Greek citizenship	0.81	0.81	0.81
Age (years)	36.79	35.94	36.41
	(11.14)	(11.12)	(11.14)
Part-time worker	0.37	0.34	0.36
Accommodation & food service sector	0.54	0.51	0.53
Total pay (including zeros)	5017.95	5390.78	5188.22
	(5691.18)	(6400.00)	(6026.38)
Basic pay (full-time)	5308.16	5629.73	5457.41
	(5300.01)	(6097.73)	(5683.53)
Basic pay (part-time)	2072.64	2161.36	2112.49
	(2216.41)	(2401.75)	(2300.28)
Days worked (full-time)	86.08	95.57	90.41
	(95.07)	(101.74)	(98.27)
Days worked (part-time)	39.68	37.38	38.65
	(68.67)	(71.25)	(69.87)
Number of workers	47,542	39,463	87,005
Number of firms	9,002	6,669	15,671

Notes: Descriptive statistics refer to the year 2014, the year before the construction of refugee camps. The sample covers private sector employees on treated islands (Lesbos, Samos, Chios, Leros, and Kos) and the alternative control group (Ionian islands).

Alternative control group: Ionian Islands

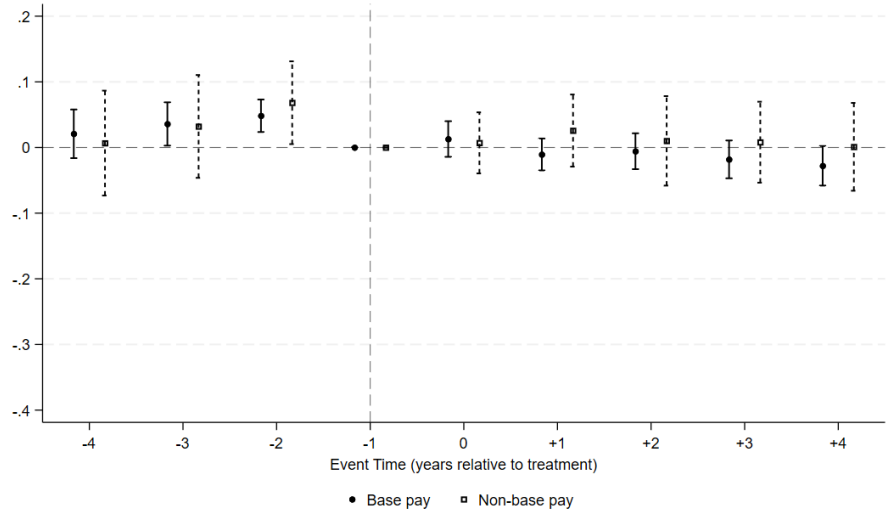


Base and non-base pay, all sectors

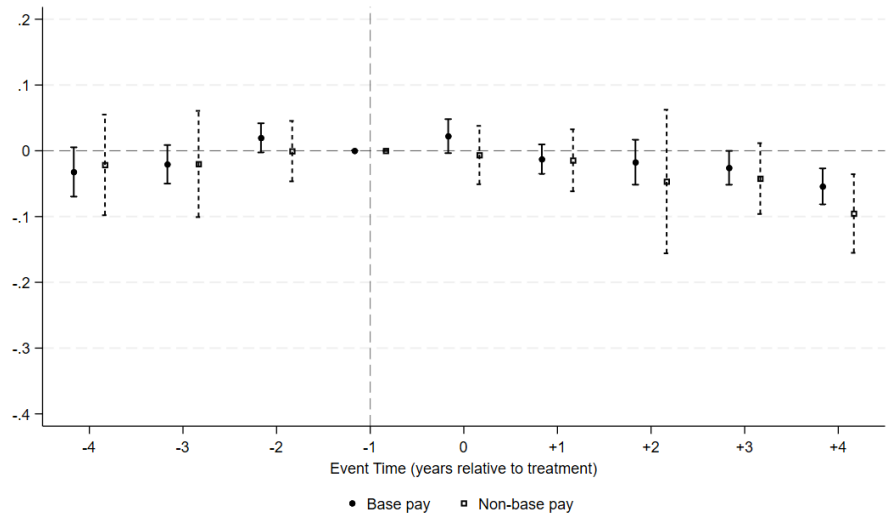


Full-time and part-time days worked, all sectors

Placebo treated groups



Ionian Islands placebo



Crete placebo

Mechanism

Media Coverage

United States

- Time — "Thousands of Refugees are Overwhelming Greek Tourist Islands", July 22, 2015
  - Lesbos residents, tourists, and aid groups overwhelmed by urgent sanitary and logistical crisis.

United Kingdom

- The Guardian — "Kos: the Greek island where refugees and tourists share the same beaches", Sept 5, 2015
  - Refugees arriving in flimsy boats live next to sunbathing tourists; lifejackets litter tourist beaches.

Media Coverage

Germany

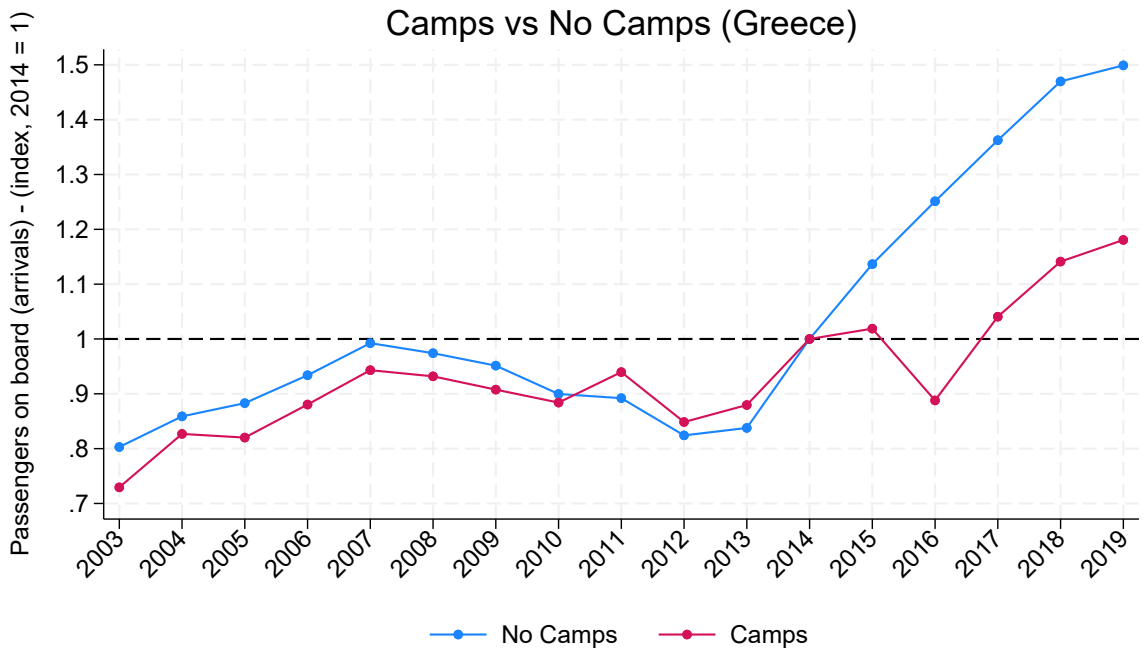
- Der Tagesspiegel — "Flüchtlinge auf Kos in Griechenland: Ohnmacht im Ferienparadies", Aug 14, 2015
  - Thousands of refugees camped in difficult conditions awaiting registration; local capacity strained; tensions rise.

France

- Le Monde — "En Grèce, l'île de Kos débordée par les migrants", Aug 17, 2015
  - Kos as a popular tourist destination and major refugee arrival point; overwhelmed by daily landings and facing logistical challenges.

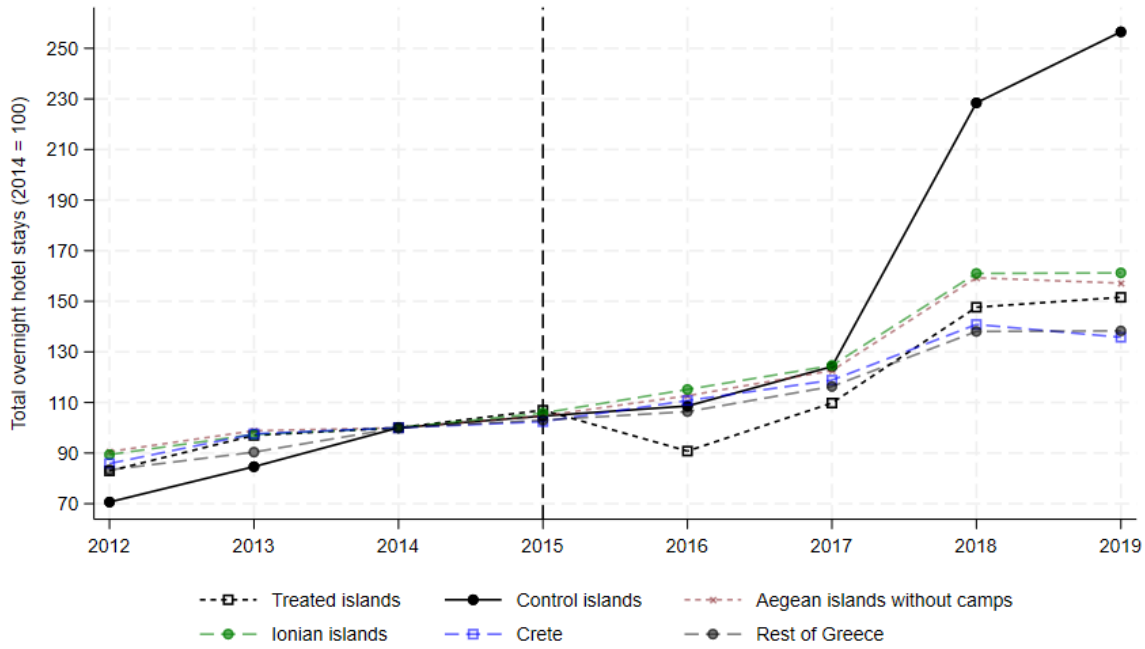
- Refugee landings may have altered tourist flows, creating potential spillovers for other islands.

Number of air passengers onboard (arrivals) to Greek airports in regions with and without refugee camps



Notes: The figure shows the total number of arriving air passengers at Greek airports located in regions with and without refugee camps. Source: Eurostat.

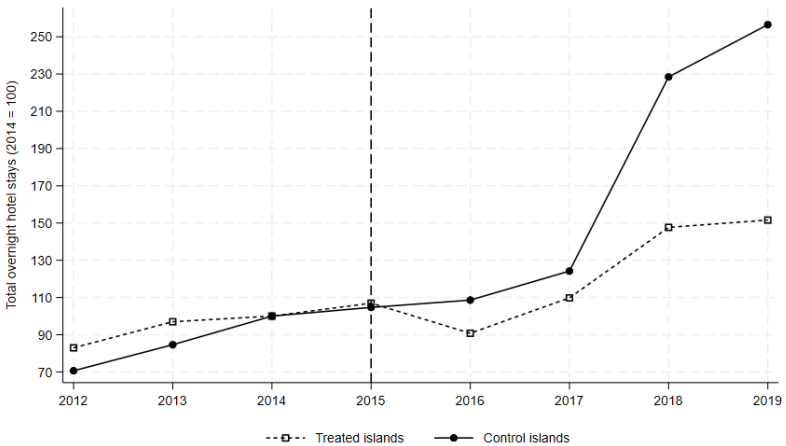
Number of overnight hotel stays in all regions of Greece



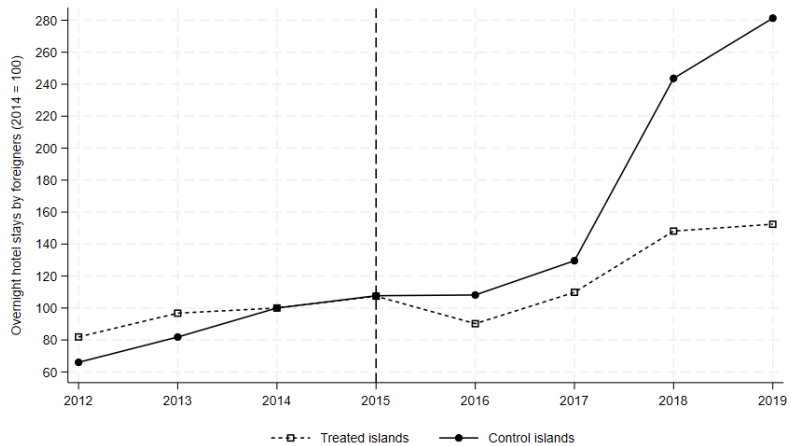
Total overnight hotel stays, all regions

Notes: The figure provides a broad regional comparison of total overnight hotel stays, including the treated islands (Lesbos, Samos, Chios, Leros, and Kos), the control islands (Cyclades), other Aegean islands without camps, Ionian islands, Crete, and the rest of Greece.

Number of overnight hotel stays in treated and control locations



Total overnight hotel stays



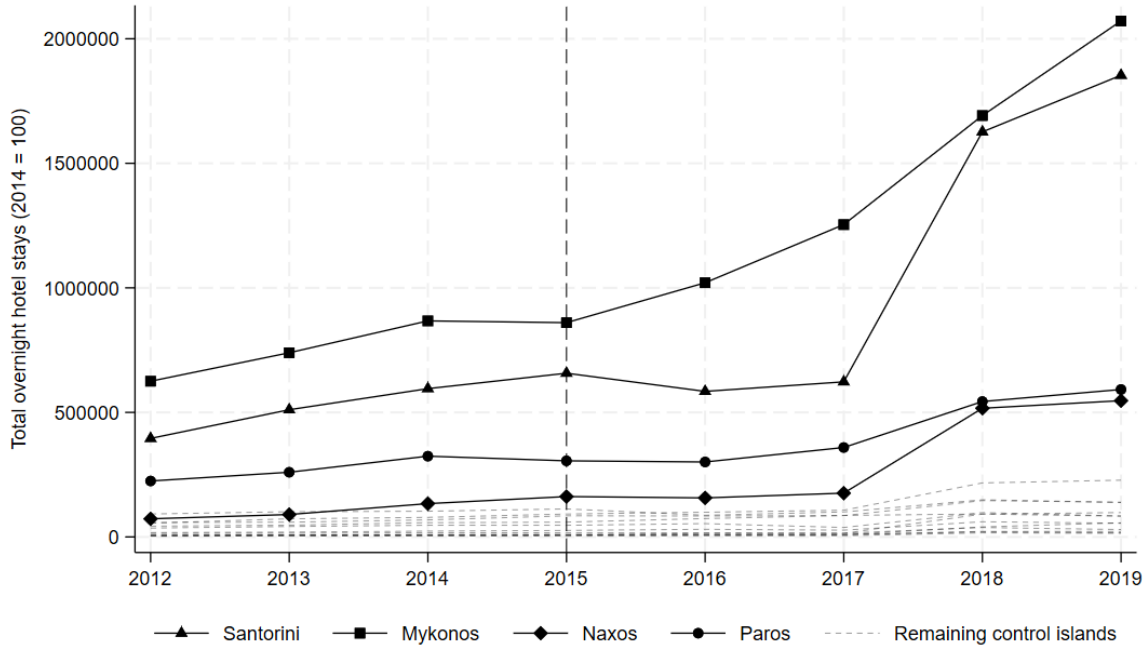
Overnight stays by foreigners

Notes: The figure displays official data on overnight hotel stays from the Hellenic Statistical Authority (ELSTAT) data portal, normalized to 2014. Panel (a) shows total overnight hotel stays and panel (b) shows overnight hotel stays by foreigners, both comparing the treated islands (Lesbos, Samos, Chios, Leros, and Kos) to the control islands (Cyclades).

Mechanisms: Tourism-Driven Demand

- Labour-market effects primarily operated through **reduced local demand**.
- Treated islands heavily rely on **tourism-intensive sectors** (accommodation and catering).
- Media coverage and humanitarian crisis **discouraged tourist arrivals** in 2015–2016.
- Declines in tourist activity **align** with observed earnings and days worked reductions.
- **Short-run effects** capture immediate impact; medium-run effects may reflect gradual tourist adjustments.

Number of overnight hotel stays in each island of the control group



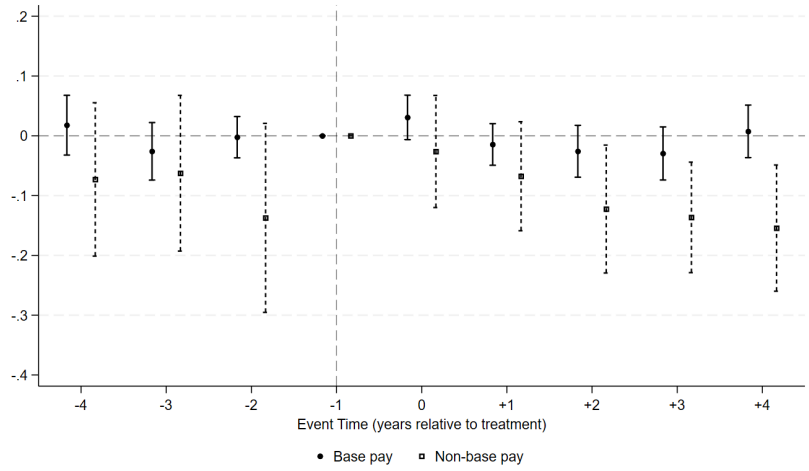
Total overnight hotel stays in each island of the control group

Notes: The figure shows total overnight hotel stays disaggregated for each of the islands in the control group (Santorini, Mykonos, Paros, Naxos, rest of Cyclades).

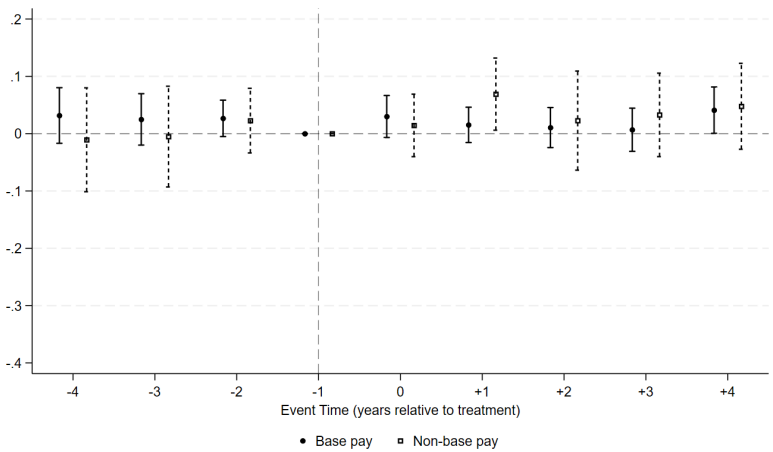
Medium-Run Tourist Flows

- Total overnight stays outside treated islands show **limited immediate displacement** (2015–2017).
- Cyclades exhibit upward trend in 2018–2019, driven by **Santorini and Mykonos**.

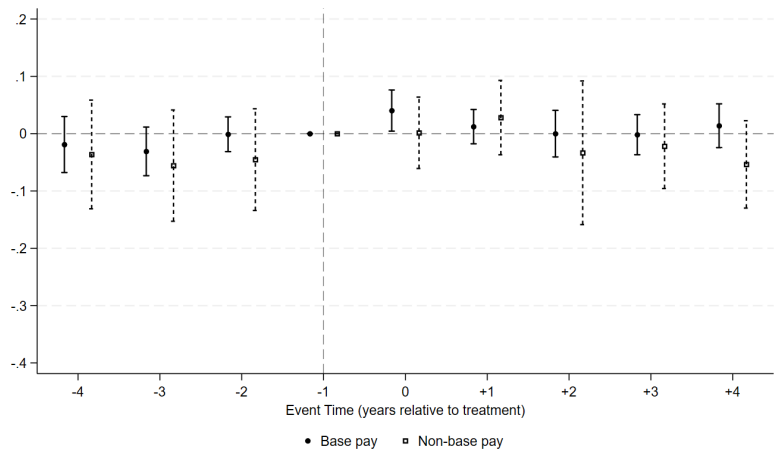
Regressions excluding Mykonos and Santorini from the control group



Benchmark



Placebo: Ionian Islands



Placebo: Crete

Conclusions

- Refugee camps in Aegean Islands reduced local **days worked and labor earnings**, mainly in accommodation.
- **Other sectors** saw only a temporary boost; effects dissipated as catering shifted to mainland firms.
- **Part-time employment** increased, reflecting adjustments along the intensive margin.
- Negative impacts amplified by **restrictive institutional and policy contexts**.
- Economic effects depend on **local geography, sectoral structure, and integration policies**.
- Lessons relevant for tourism-dependent regions facing **sudden migration shocks**.

Work in Progress: Mobility and Firm-Level Effects

- **Worker mobility:**
  - Investigating whether employees on affected islands relocate to other parts of Greece to find employment.
  - Using our data to track individual employment transitions across municipalities.
- **Firm-level effects:**
  - Use firm balance sheet data.
  - Assess impacts of refugee camps on firm revenues.

The end (for now...)

- Thanks for your attention!
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