Labour Effects of Innovation Tax Breaks

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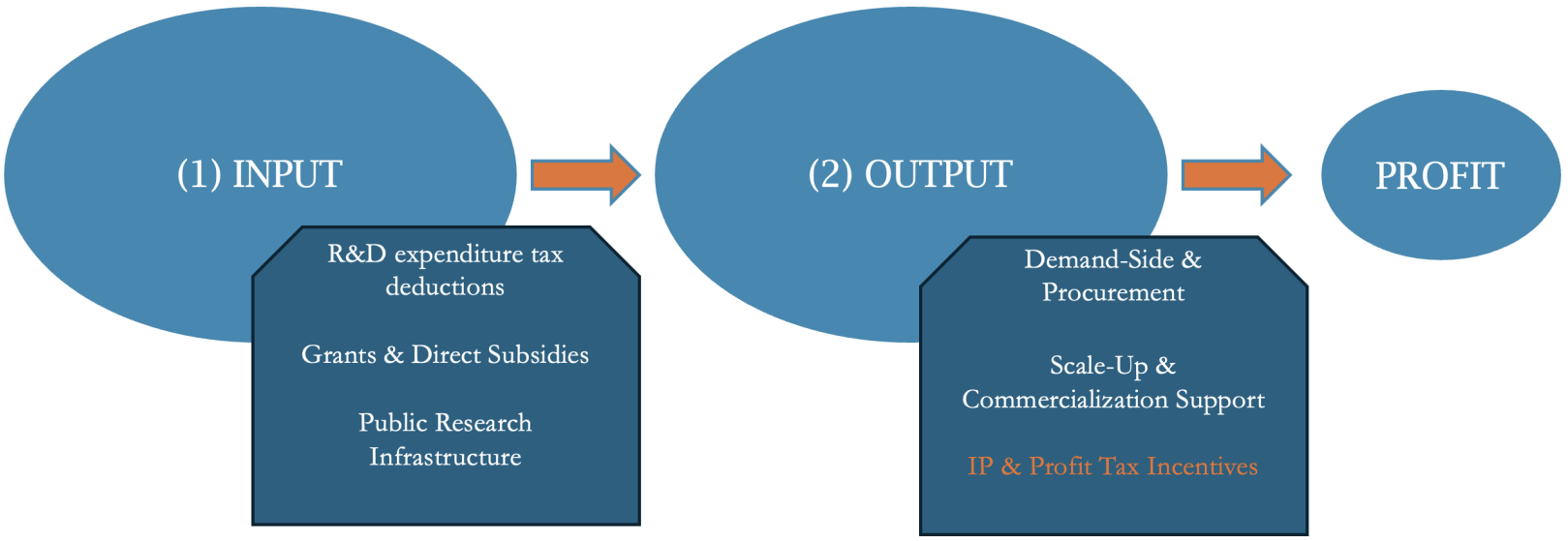
tinbergen institute

Innovation Policy and Motivation

"Innovation is essential to drive Europe's competitiveness and to ensure the health and well-being of its citizens." - (European Commission, 2022) Taxation Maps

Two types of policies meant to **(1) start up (input)** and **(2) reward innovation (output)**:



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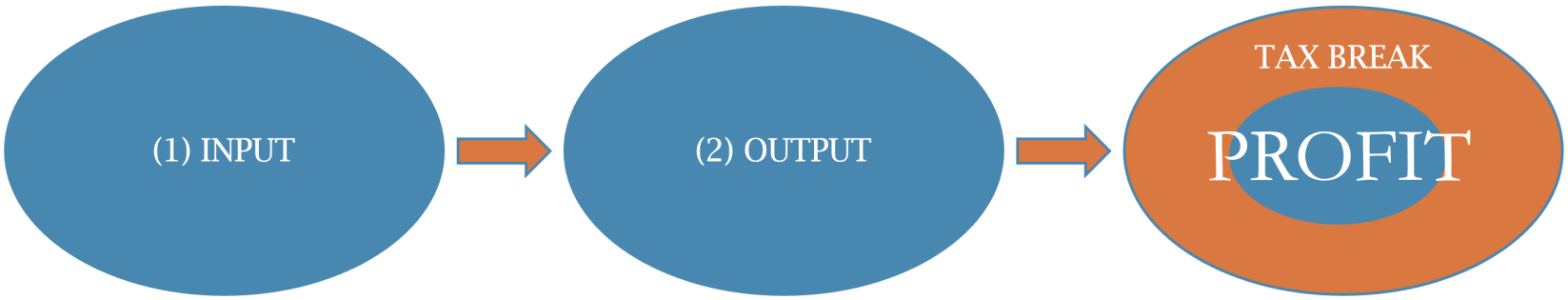

How do firms allocate the profit surplus from reduced tax burden?

- **IP location shifts:**
  - theoretical work (Haufler and Schindler, 2023)
- **Real effects:**
  - More patents and R&D spending? Limited evidence (Z. Chen et al., 2021; Dechezleprêtre et al., 2023; Schwab, 2021)
  - Effects on **labour** — a key innovation input — remain largely unexplored (Bornemann et al., 2023; S. Chen et al., 2023b).

Why Labour Outcomes?

*To take advantage of the innovation tax break firms need to stay on the **profitability path**. Where do **workers** come in?*

1. **Rent-Sharing** $\rightarrow$ Firms share rents with workers who enabled innovation (Aghion, 2018; Aghion et al., 2019; Kline et al., 2019)

2. **Workforce Adjustment** $\rightarrow$ Firms invest in new talent to sustain innovation capacity (Akcigit and Goldschlag, 2025; Decker et al., 2014)

Gap: No evidence (to our current knowledge) investigated these mechanisms in the context of output-based innovation tax breaks.

Policy Relevance: European firms' labour responses to productivity shocks have weakened (Biondi et al., 2025), making the results relevant for industrial policy design.

This Paper

Research Questions:

- → **Are there real labour effects of output-based innovation tax incentives?**
- → **What are the mechanisms through which these effects operate?**
- → **Who are the most affected workers?**

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Overview:

- Studies the impact of Dutch **Innovation Box** policy on **firm and worker labour outcomes**.
- Methodology: **staggered difference-in-differences** with matched treatment and control panels:
  - *firm-level:* selection is a concern - descriptive evidence for workforce composition.
  - *worker-level:* causal evidence of rent-sharing mechanisms.
- Bridges: *corporate tax incidence*, *innovation policy evaluation*, *rent-sharing*, and *workforce adjustment* literature. All Related Literature
- Uses firm and matched employer-employee administrative data from the Netherlands.

Preview of Results

- We find evidence of significant labour effects operating through two mechanisms:
  - Higher employee compensation for incumbent workers at treated firms → (1) *rent-sharing to retention channel*
  - Higher proportion of high educated STEM workers in the long-run → (2) *workforce adjustment channel*

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- (1) Incumbent employees at firms that receive tax breaks:
  - earn €1,400 more each year compared to similar workers at comparable non-treated firms → 4% yearly salary increase.
  - are 6pp less likely to switch jobs in the long run.
  - **All workers affected**, but highly educated STEM workers capture more of the surplus → distributive effects.

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Policy recommendation: Innovation profit tax breaks→ **reinforce worker retention** through rent-sharing → **limits labour mobility** → possible anti-competitive effects.

Treated Firms and Policy Timeline

We define treatment as the **first time** the firm receives **innovation tax break**.

- After 2010: profit from innovation taxed at 5% instead of 25%.

- In total: **7851 unique firms** receive innovation tax reduction from 2010-2018.
- 91.4% firms tax break received tax benefit in the same year they register their associated production costs.

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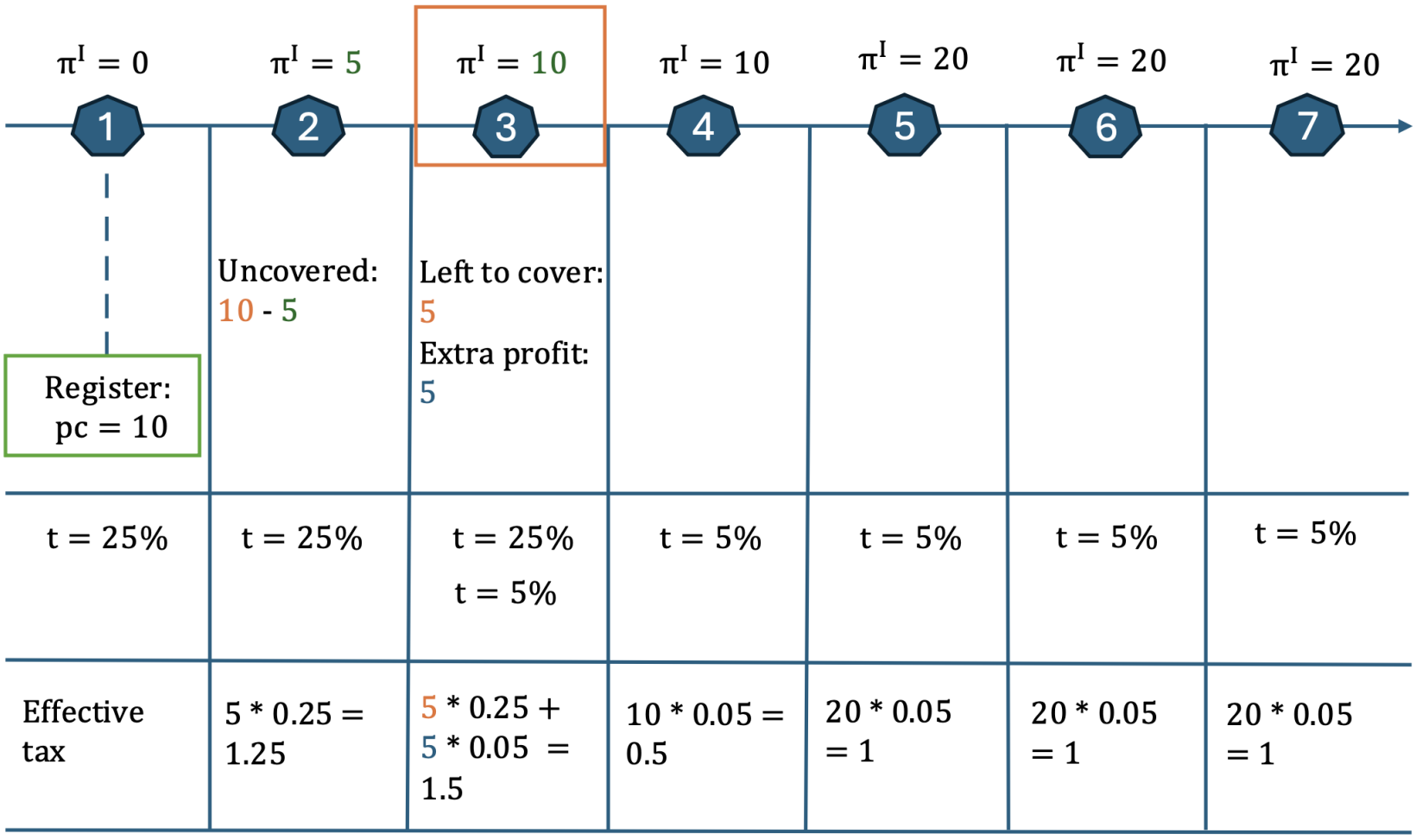
- **Treated firms:** firms that receive the innovation tax break.
- **Treated workers:**
  - **incumbent workers:** workers hired at least $t - 3$ periods before firm receives treatment.
  - **new hires:** workers hired post-treatment. (*work in progress*)

Treated Detail

Innovation Box: Policy Example



Policy Detail (1): Innovatiebox Box vs OctooiBox
Policy Detail (2): Innovation Box vs WBSO
Policy Detail (3): Why Limited Uptake

Data Sources (1)

Panel	Time	Description
Panel 1: Innovation Box Applicants	*2010 - 2018*	- year - firm ID - production costs
Panel 2: Dutch Universe of Firms (ABR/BDK)	*2007 - 2023*	- year - firm ID - firm characteristics
Panel 3: Production Statistics (PS)	*2007 - 2023*	partial survey Dutch firms: - year - firm ID - production characteristics
Panel 4: Universe of Workers (POLIS/SPOLIS)	*2006 - 2023*	- year - person ID - firm ID - income information - personal information - education information

Summary Stats Data Detail

Selection into Treatment

Probit model: probability of receiving Innovation box, estimated on firm characteristics at $t-3$, where t is treatment year

Characteristic	**Coef.**	**(SE)**
Larger firms ($\log$ employment)	$+0.210^{***}$	(0.012)
Higher wages ($\log$ mean base income)	$+0.723^{***}$	(0.049)
More automated ($\log$ automation costs)	$+0.067^{***}$	(0.008)
Manufacturing sector	$+0.703^{***}$	(0.064)
Younger workforce (mean worker age)	-0.027^{***}	(0.002)
Younger firms (firm age)	-0.003^{***}	(0.001)
Foreign-owned	-0.154^{***}	(0.027)
Observations		$720{,}120$
Log-likelihood		$-9{,}838.8$

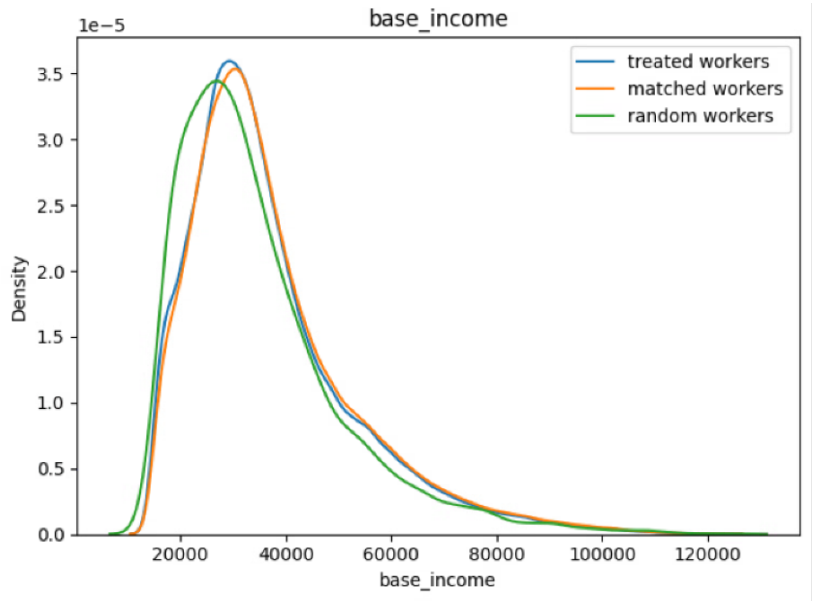
$^{***}p < 0.01$. Probit Across Years

Methodology (1): Rent-Sharing Mechanism

We implement the Sun and Abraham, 2021 estimator to address treatment effect heterogeneity under staggered adoption Staggered DiD detail:

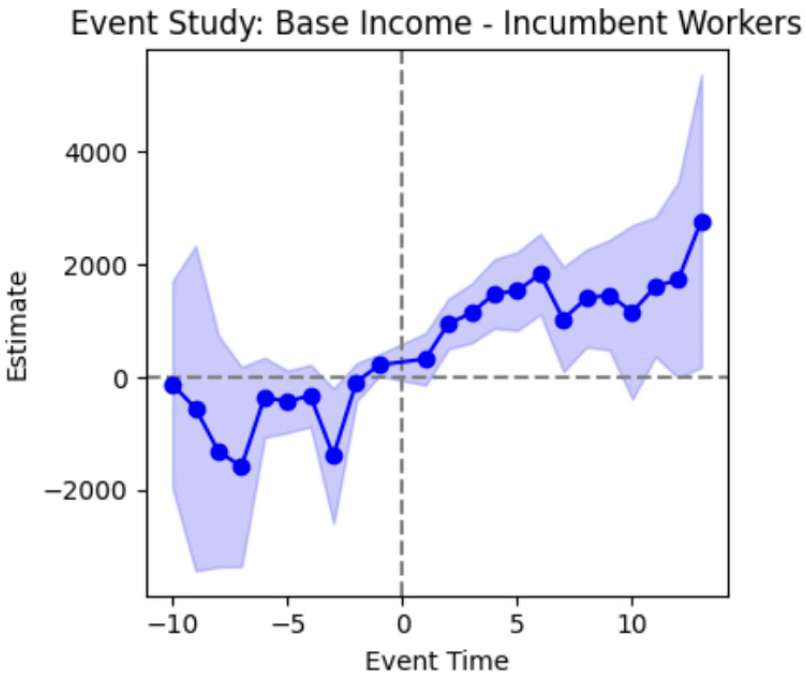
$$Y_{it} = \sum_{\ell \neq -1} \sum_{g} \delta_{\ell g} \left(\mathbf{1}\{t - G_i = \ell\} \cdot \mathbf{1}\{G_i = g\} \right) + \alpha_i + \lambda_t + \varepsilon_{it} \tag{1}$$

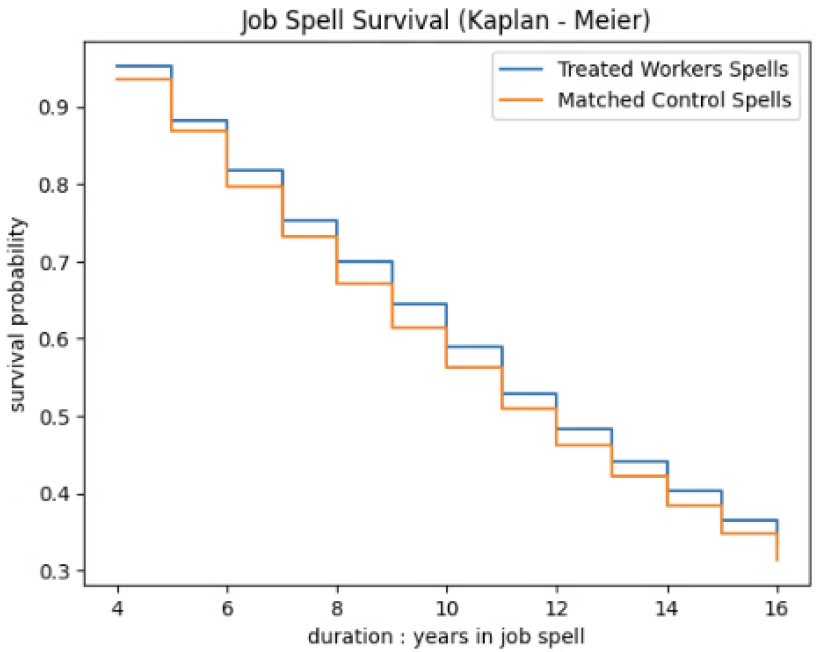
- Selection into treatment not a problem for incumbent workers $\rightarrow$ no anticipation of firm Innovation Box adoption.
- Define incumbent workers $\rightarrow$ worked at the firm at least 3 years before treatment.
- Match on: **individual** and **firm** characteristics Matching Algorithm Workers.
- Match performs well $\rightarrow$ credible counterfactuals.



Results (1)

- Treated incumbent workers **4% increase** in annual salary → rent-sharing.
- **6pp more likely** to remain at the same firm 8 years after being treated → retention.





No change in intensive margin labour participation: Other Labour Outcomes

Who Benefits?

All worker types benefit, **but**:

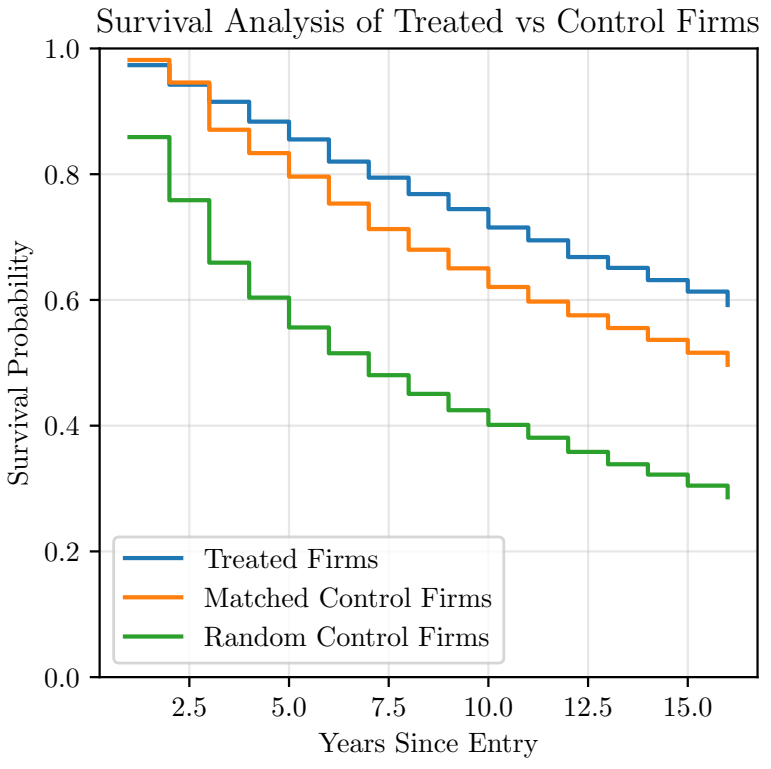
- **STEM educated** workers benefit 3 times more.
- **University educated** workers benefit 2.5 times more.
- **Men** benefit 3.2 time more.

	Average Effect	Std. Error	Observations	R^2
Base Income	1,402***	(88.990)	5,149,272	0.825
STEM	2,498***	(132.712)	1,544,782	0.914
non-STEM	820***	(78.026)	3,604,490	0.739
Below Upper Secondary	714***	(52.052)	515,927	0.336
Upper Secondary	1,059***	(104.465)	1,544,782	0.511
Tertiary	1,727***	(124.078)	3,088,563	0.845
Male	1,568***	(111.025)	4,119,418	0.805
Female	419***	(80.252)	1,029,854	0.753
Immigrant Background	908***	(112.207)	514,927	0.773
No-Immigrant Background	1,465***	(127.032)	4,634,345	0.846

$^{*}p < 0.10, ^{**}p < 0.05, ^{***}p < 0.01$

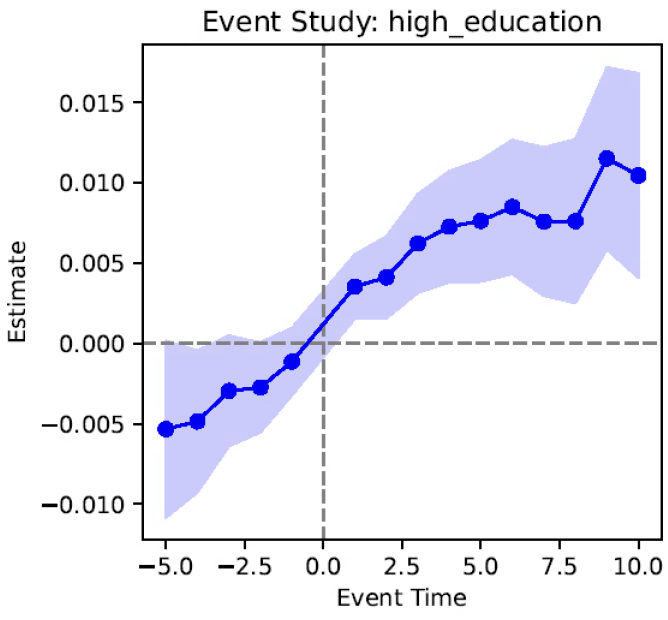
Methodology (2): Workforce Adjustment Mechanism

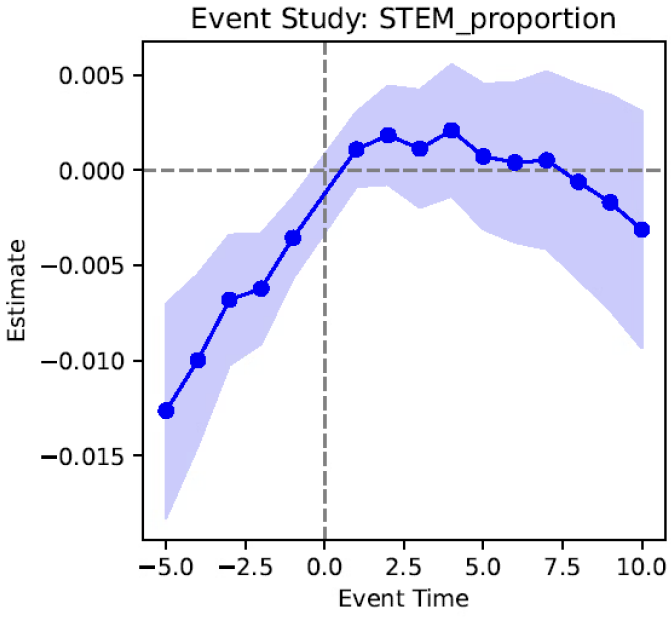
- **Firm-level results** - analyse how workforce composition changed over time.
- Selection into treatment $\rightarrow$ **results should be interpreted as descriptive**.
- Staggered difference-in-difference with matched control and treated **firms** at $t-3$. Matching Algorithm Firm
- Matching strong despite selection concerns $\rightarrow$ same survival probabilities. Balancing Table
- The policy appears to **keep firms longer in the market** $\rightarrow$ effect on firm entry and exit.



Results (2)

- Pre-treatment skill and education catch-up.
- Evidence of **complementarity between input and output policies**?
- **Firms still on expansion path**?





Industry Heterogeneity

Takeaways and Implications

Innovation tax breaks generate:

1. **rent-sharing channel** — raising incumbent wages by 4% and reducing turnover.
2. **workforce adjustment channel** — shifting firm composition toward high-educated STEM workers.

Policy implication:

- **worker level:** workers receive part of surplus profits.
- **firm level:** tax break could lead to retention responses.
- **socially:** we offer a partial equilibrium view, no results on total innovation activity.

Further Work & Discussion

Discussion

- Results are **robust** to different matching specifications and panels allowing for firm entry and exit.
- **Still under investigation:**
  - ex-ante hiring & expansion margins.
  - worker and firm fixed effects.
  - incumbent worker mobility.
- Economy wide effect from reduced mobility.

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Thank you!

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Europe Tax Breaks

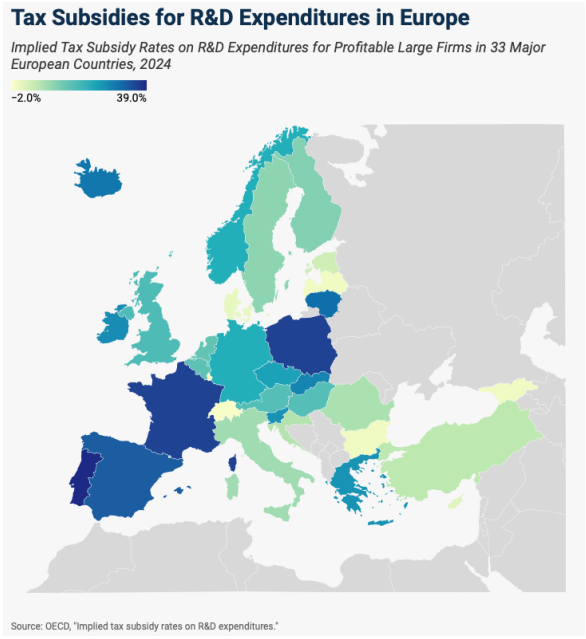

Figure: Implied Innovation Tax Subsidies in Europe (OECD, 2025)

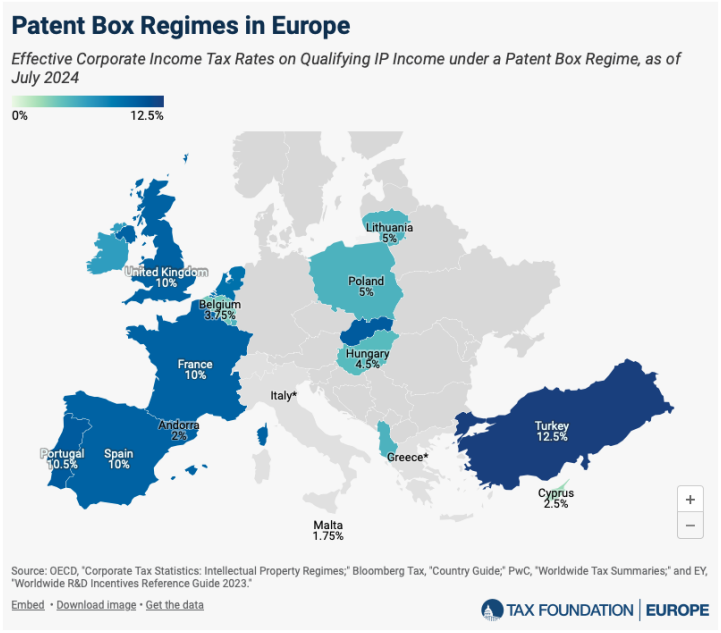

Figure: Patent Box Regimes in Europe (OECD, 2025)

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Related Literature (1)

- **Input policy on**:
  - **Innovation outputs**: Bloom et al., 2002; Bottazzi and Peri, 2003; S. Chen et al., 2023a; Dechezleprêtre et al., 2023; Jaffe, 1986; Kogan et al., 2017
  - **Innovation inputs**: Agrawal et al., 2020; Appelt et al., 2023; J. Chen and Hshieh, 2024; Guceri, 2018; Guceri and Liu, 2019; Lokshin and Mohnen, 2013
- **Output policy on**:
  - **Innovation outputs**: not Agrawal et al., 2020; Cappelen et al., 2012; Z. Chen et al., 2021; Dechezleprêtre et al., 2023; Schwab, 2021
  - **Innovation inputs**: Bornemann et al., 2023; S. Chen et al., 2023b
- **Innovation policy evaluation**
  - Spillovers, patents, R&D: Bloom et al., 2002; Bottazzi and Peri, 2003; S. Chen et al., 2023a; Jaffe, 1986; Kogan et al., 2017
  - Scientific collaboration: Aghion, 2018; Arora et al., 2021; Hohberger et al., 2015
  - Firm outcomes & regulation: Aghion, 2023; Altuzarra and Serrano, 2010; Arora et al., 2023
- **Labor effects of corporate tax incidence**
  - Abowd et al., 1999; Blanchard and Wolfers, 2000; Fuest et al., 2018; Saint-Paul, 2002
- **Worker outcomes in innovative firms**
  - Rent-sharing: Battisti et al., 2023; Bessen et al., 2025; Kline et al., 2019
  - Labor practices & education: Black et al., 2004; Graddy-Reed et al., 2021
  - Workforce adaptation: Deming, 2023; Gouin-Bonenfant, 2022

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Patent Box vs Innovation Box

	Octrooibox (2007–2009)	Innovatiebox (2010–present)
Calculatory basis	Net income attributable to patented self-developed intangible assets (after deduction of cost base)	Net income from patented and/or S&O-certified assets
Effective tax rate	10% (up to 4× production costs)	**5% (flat, no box ceiling),** 7% (in 2018), 9% (in 2019)
Eligibility	Only self-developed patented assets	Patents and S&O-certified innovations
Cost treatment	Production costs must be activated and deducted at normal VPB rate	Production costs must be recovered before profits enter the box
Scope of benefits	Only royalties and other attributable revenues	Broader: royalties, sales income, licensing revenues, etc.
Transferability	Only for VPB entities; not transferable	Only VPB entities; not transferable
Other IP rights	No (strictly patents)	Yes (including S&O without patent, under certain conditions)
Complexity	High; disagreements common with tax authorities	Improved clarity and predictability; ruling available
Ceiling / cap	Yes: max 4× production costs	No ceiling; full benefit above threshold

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Innovatiebox vs. WBSO

	Innovatiebox	WBSO
Policy lever	**Output-based** — reduces tax on *profits* from innovation	**Input-based** — reduces tax on *costs* of innovation
Timeline	2010–present	1994–present
Tax instrument	Reduced CIT rate on qualifying profit (9% since 2019)	Wage tax credit on R&D labor costs; additional deduction for self-employed
Calculatory basis	Net income from patented and/or S&O-certified intangible assets	Qualifying R&D wage bill (+ flat supplement for other R&D costs)
Qualifying condition	Patent or S&O certificate *and* realized profit	Approved S&O declaration (RVO); no profit requirement
Benefit timing	*Ex post* — only when innovation generates taxable income	*Ex ante* — immediate reduction of R&D labor costs
Eligible firms	CIT-paying entities (VPB); SME and large firm tracks	All firms with R&D employees, incl. start-ups & loss-making firms
Primary beneficiary	Profitable, commercializing firms	Firms in active R&D phase, regardless of profitability
Risk borne by firm	Low — benefit only materializes with success	High — subsidizes input even if R&D fails
Additionality mechanism	Encourages profit retention and IP development in NL	Directly lowers marginal cost of hiring R&D labor

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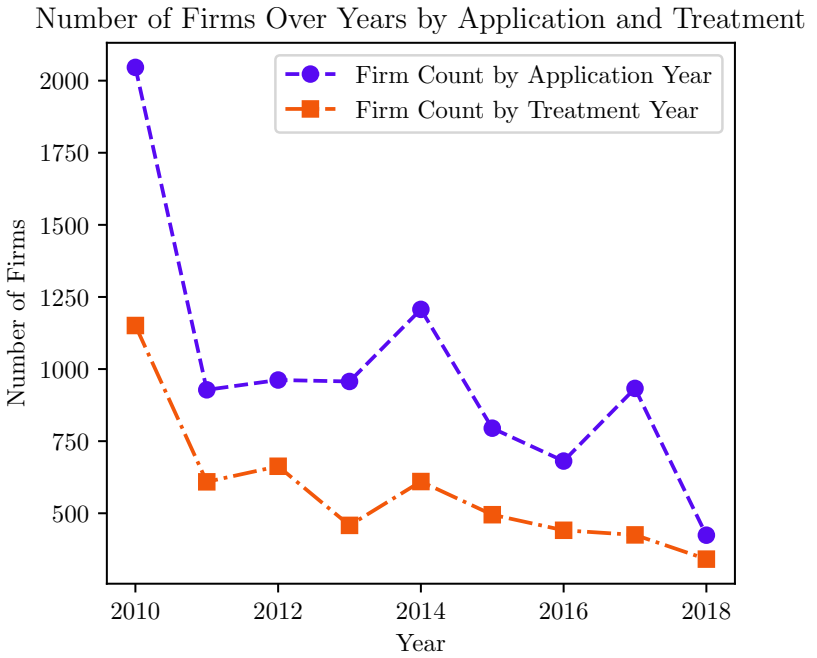
Limited Uptake

- Costly to apply.
- Profit requirement.
- Attribution problem.
- Information asymmetry.



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Data Summary Statistics

Variable	Unit	Count	Mean	Std. Dev.
Foreign		2,688,640	0.0495	0.2170
Full time Employee Equivalent		2,693,497	48.15	515.27
Firm Age		2,693,497	19.09	15.49
Total Revenue	(1000s euros)	617,260	20,615.4	194,354
Capital	(1000s euros)	603,007	847.1	11,344.5
Materials	(1000s euros)	599,517	13,549.8	161,725
Wage Bill	(1000s euros)	619,192	101.1	765.9
Automation Costs	(1000s euros)	490,759	181.6	2,890.2
Operating Costs	(1000s euros)	619,955	32,818.5	320,628.1
Mean Base Income	(euros)	2,520,634	29,655.9	12,069.1
Mean Bonuses	(euros)	2,520,634	3,354.4	8,517.0
Mean Overtime Income	(euros)	2,520,634	427.2	1,454.0
Proportion Male		2,520,634	0.61	0.340
Proportion Immigrant		2,520,634	0.12	0.235
Mean Age		2,518,796	40.67	7.50
Proportion Highly Educated		2,520,634	0.14	0.197
Proportion STEM Educated		2412711.0	0.0066	0.041
Incumbent Workers		2,520,634	30.18	321.9
Total Workers (SPOLIS)		2,520,634	38.03	378.9
New Hires		2,520,634	6.70	84.8

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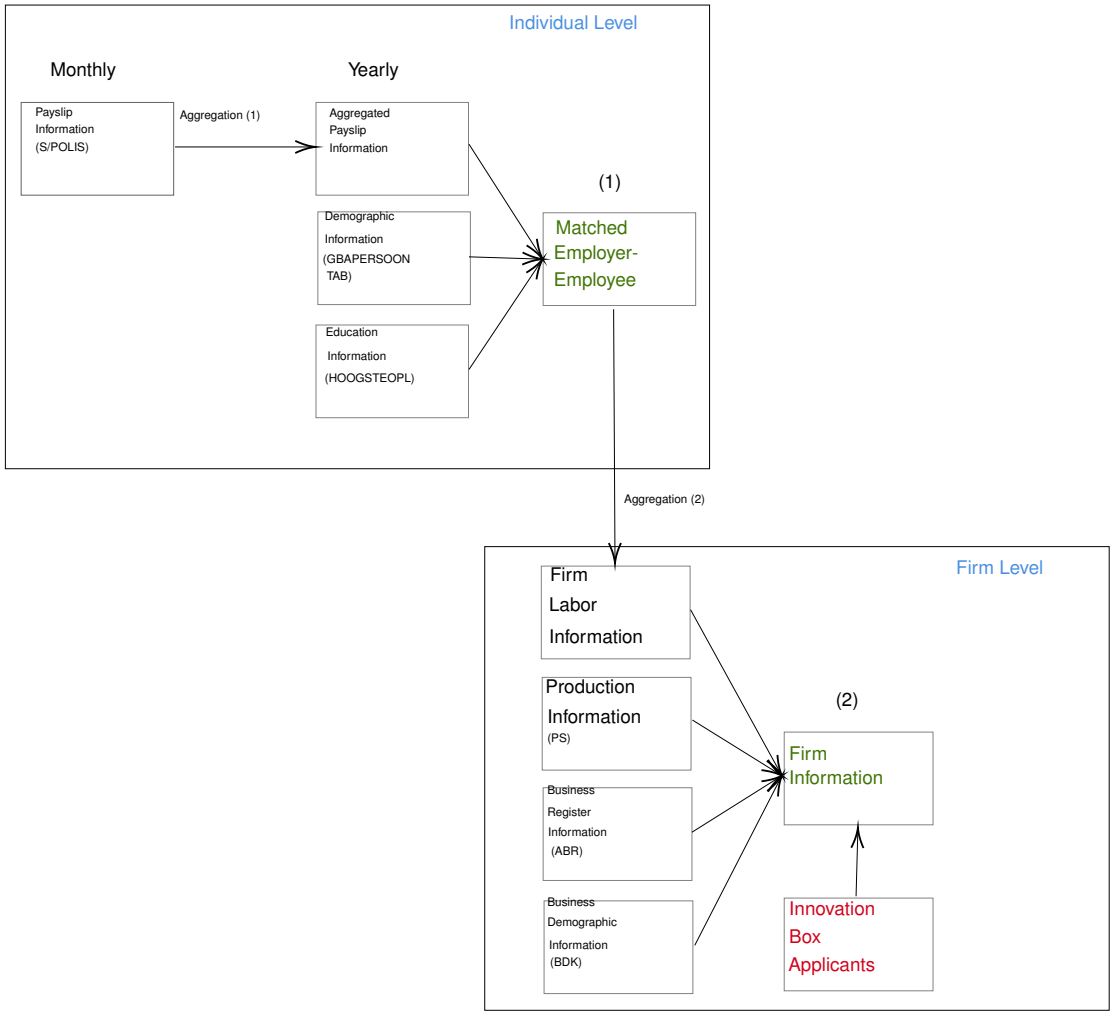
Data Sources and Aggregations



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Treated Firms

	Mean Income	SD Income	Mean Employment	SD Employment	Firms
Panel A. Firm size					
Large	42,786.03	10,388.21	1,082.19	2,329.38	1,026
Medium	40,005.09	8,303.51	109.96	51.56	3,436
Small	38,505.55	9,861.12	19.03	12.52	6,944
Panel B. Foreign ownership					
Domestic	38,295.35	9,032.03	120.33	766.05	7,882
Foreign	43,752.31	10,520.45	246.40	797.95	2,348
Panel D. Industry					
Agriculture	33,579.31	8,612.05	44.33	92.25	212
Construction	40,233.86	8,904.83	223.70	513.92	454
Health	35,106.68	8,132.21	656.35	1,778.80	59
Manufacturing	37,670.17	7,696.43	129.52	406.35	3,094
Services	40,516.21	10,442.22	144.20	952.40	5,691
Water	37,444.95	7,271.25	169.95	424.37	69

Table: Treated Firms

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Probit Across Years

	Probability Application Innovation Box Policy - on characteristics at $t-3$ before application year								
	ALL	2010	2011	2012	2013	2014	2015	2016	2017
Variable									
Intercept	-9.245***	-15.997***	-10.861***	-11.373***	-10.120***	-12.045***	-10.363***	-8.930***	-8.893***
	(0.499)	(1.213)	(1.672)	(1.708)	(1.530)	(1.441)	(1.670)	(1.877)	(1.522)
Foreign	-0.154***	-0.306***	-0.430***	-0.475***	-0.232***	-0.257***	-0.044	-0.329***	0.562***
	(0.027)	(0.063)	(0.094)	(0.095)	(0.086)	(0.079)	(0.090)	(0.106)	(0.069)
Firm age	-0.003***	-0.002*	-0.002	-0.007***	0.002	-0.004**	-0.001	-0.002	0.000
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
log current employment	0.210***	0.270***	0.205***	0.307***	0.036	0.204***	0.128***	0.138***	0.177***
	(0.012)	(0.027)	(0.038)	(0.038)	(0.038)	(0.033)	(0.041)	(0.044)	(0.035)
log automation costs	0.067***	0.088***	0.106***	0.085***	0.093***	0.017	0.034	0.107***	0.080***
	(0.008)	(0.019)	(0.026)	(0.027)	(0.026)	(0.022)	(0.028)	(0.031)	(0.024)
log base income (mean)	0.723***	1.378***	0.829***	0.776***	0.841***	1.038***	0.872***	0.681***	0.631***
	(0.049)	(0.119)	(0.164)	(0.165)	(0.148)	(0.141)	(0.163)	(0.183)	(0.146)
Manufacturing	0.703***	0.755***	0.954***	1.109***	0.971***	0.729***	0.349*	0.547**	-0.138
	(0.064)	(0.159)	(0.253)	(0.249)	(0.225)	(0.178)	(0.186)	(0.218)	(0.158)
Services	-0.042	-0.034	0.133	0.264	0.092	-0.016	-0.208	-0.038	-0.389***
	(0.063)	(0.158)	(0.255)	(0.248)	(0.223)	(0.173)	(0.179)	(0.213)	(0.147)
Construction	-0.181***	-0.061	-0.061	0.174	-0.301	-0.410**	-0.525**	-0.019	-0.481***
	(0.070)	(0.171)	(0.277)	(0.266)	(0.251)	(0.194)	(0.213)	(0.231)	(0.177)
Mean worker age	-0.027***	-0.025***	-0.024***	-0.005	-0.029***	-0.031***	-0.028***	-0.026***	-0.008
	(0.002)	(0.006)	(0.008)	(0.008)	(0.007)	(0.007)	(0.008)	(0.008)	(0.007)
Log-likelihood	-9,838.769	-2,014.119	-983.128	-922.757	-1,133.587	-1,270.954	-822.347	-727.838	-995.917
AIC	19,697.538	4,048.238	1,986.256	1,865.514	2,287.174	2,561.907	1,664.695	1,475.677	2,011.834
BIC	19,789.384	4,118.368	2,055.830	1,934.158	2,357.745	2,632.530	1,734.562	1,545.217	2,081.712
Observations	720,120	90,299	85,415	77,836	94,369	94,864	87,956	85,129	88,055

$^{***}p < 0.01, ^{**}p < 0.05, ^{*}p < 0.1.$

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Sun and Abraham (2021) - Assumptions and Motivation

The estimator is consistent under three key assumptions:

1. Cohort-specific treatment effects follow a common dynamic profile

- Institutional design: once firms qualify for the Innovation Box, treatment persists as long as profits are generated from registered costs
- 87% of firms remain continuously treated
- 13% move in and out (likely due to profit exhaustion and re-registration; imputation error cannot be fully excluded)
- Robustness: excluding these firms does not change results
- Requires no cross-firm interference:
  - Plausible for wages and bonuses
  - Potential spillovers for labor composition (shared labor markets)
  - Composition results interpreted as descriptive

2. No anticipatory behavior

- Plausible for wage effects
- Less plausible for hiring/composition decisions
- Firms may adjust hiring prior to formal application
- Pre-treatment dynamics under active investigation

3. Parallel trends

- Strategy:
  - Flexible matching 3 years pre-treatment
  - Restrict comparison group to credible controls
  - Sun & Abraham estimator uses only never-treated units
- Conservative design: prioritizes internal validity over efficiency

Interpretation

Group-time average treatment effects under staggered adoption, identified from clean comparisons to never-treated firms.

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Workers Matching

Features: industry, province, firm size, income, worker age, tenure, contract type, gender, immigration background, education, field of study

Input: treated workers $\mathcal{W}$, control workers $\mathcal{C}$, firm treatment dict $\mathcal{D}_f$, features $\mathcal{F}$, neighbors k, timing rule x
Output: matched pairs $\mathcal{M}$

1. Extract first treatment year t_f for each firm from $\mathcal{D}_f$
2. For each worker $w \in \mathcal{W}$, assign $t_w \leftarrow t_f$ of their firm f
3. Set match year $m_w \leftarrow t_w - x$ for each treated worker
4. Retain only workers present in $\mathcal{W}$ at both t_w and m_w
5. Build worker treatment dict $\mathcal{D}_w = \{w : m_w\}$
6. **For each** match year y (increasing order):
   (a) Let $\mathcal{T}_y \subset \mathcal{W}$ = treated workers with $m_w = y$, observed at year y
   (b) Let $\mathcal{C}_y \subset \mathcal{C}$ = never-treated workers observed at year y
   (c) Run k-NN on $\mathcal{F}$, match $\mathcal{T}_y$ to $\mathcal{C}_y$
   (d) Append $(w_{\text{treated}}, w_{\text{control}}, y)$ to $\mathcal{M}$
7. **Return** $\mathcal{M}$

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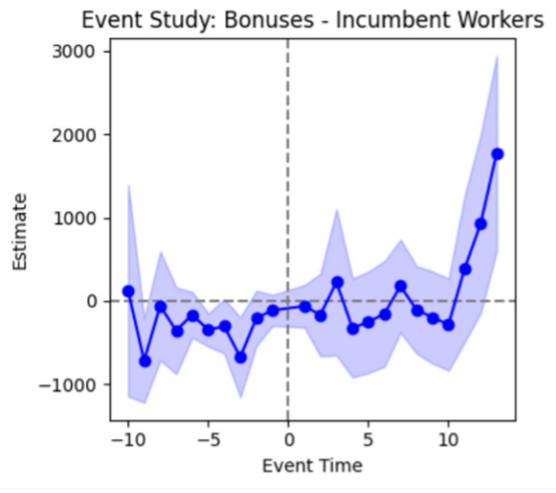
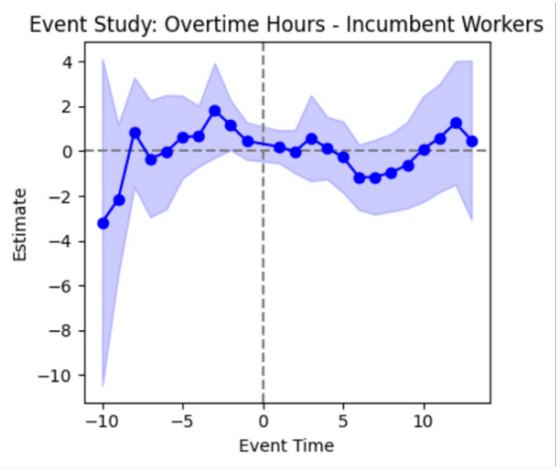
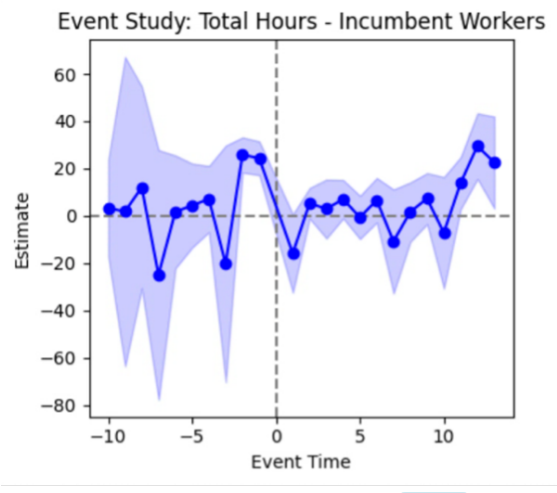
Rent-Sharing: Other Outcomes







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Firms Matching

Features: industry, province, foreign ownership, firm size, automation costs, mean base income, worker age

Input: firms panel $\mathcal{U}$, applicants $\mathcal{I}$, features $\mathcal{F}$, neighbors k, timing rule, `allow_later_treated`
Output: matched pairs $\mathcal{M}$

1. Extract first treatment year t_i for each firm from $\mathcal{I}$
2. Assign match year m_i to each treated firm via timing rule
3. Group treated firms by m_i into year-based cohorts
4. **For each** match year y (increasing order):
   (a) Let $\mathcal{T}_y$ = treated firms with $m_i = y$; build candidate pool $\mathcal{U}_y \subset \mathcal{U}$ at year y
   (b) If `allow_later_treated` $=$ `False`: remove all ever-treated firms from $\mathcal{U}_y$ except those with $m_i = y$
   (c) Run k-NN on $\mathcal{F}$, match treated to control firms
   (d) Append $(\text{treated}, \text{control}, y)$ to $\mathcal{M}$
5. **Return** $\mathcal{M}$

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Matching Balancing Table

	Baseline	Matched samples			
	Unmatched Difference	Timing rule: 3 periods before treatment 1:2 cell matching		1:1 cell matching	
Characteristic		False	True	False	True
Matching characteristics					
Foreign	0.096***	-0.031***	-0.033***	-0.060	-0.066
	(0.000)	(0.000)	(0.005)	(0.102)	(0.297)
Employment	207.419***	52.615*	-21.779	-35.754	-131.184
	(0.000)	(0.080)	(0.234)	(0.556)	(0.750)
Firm Age	-0.469***	-0.341***	-0.384***	-0.355**	-0.440*
	(0.000)	(0.001)	(0.009)	(0.048)	(0.060)
Automation Costs	754.166***	365.418**	178.213*	124.891	162.939
	(0.000)	(0.017)	(0.092)	(0.174)	(0.117)
Operating Costs	73,763.786***	30,519.456***	13,514.730**	21,009.350**	5,815.046*
	(0.000)	(0.004)	(0.020)	(0.030)	(0.094)
Base Income	29.835***	19.198	-120.088	23.384	-219.231
	(0.000)	(0.384)	(0.448)	(0.516)	(0.604)
Mean Worker Age	-0.025	0.034***	0.057***	0.045***	0.042***
	(0.247)	(0.000)	(0.000)	(0.000)	(0.000)
Non-matching characteristics					
Revenues	69,486.387***	30,828.047***	17,759.420***	20,010.636***	13,901.865**
	(0.000)	(0.001)	(0.006)	(0.003)	(0.029)
Capital Costs	4,260.096***	2,770.954***	2,023.605**	2,070.283**	2,107.562**
	(0.000)	(0.004)	(0.022)	(0.014)	(0.029)
Material Costs	44,436.456***	17,280.993***	10,340.434**	10,171.605**	8,028.996*
	(0.000)	(0.006)	(0.020)	(0.015)	(0.069)
Capital Intensity	2.187**	1.739***	1.633***	2.473***	2.310***
	(0.045)	(0.004)	(0.003)	(0.002)	(0.004)
Value Added Per Worker	-48.528***	-17.210	-16.296**	-19.905	-12.987
	(0.000)	(0.106)	(0.030)	(0.486)	(0.453)
Bonuses	872.060***	426.174***	270.040***	329.935***	145.281***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Hire Rate	-0.054***	-0.002	0.000	-0.002	0.001
	(0.000)	(0.392)	(0.335)	(0.222)	(0.181)
Middle Education Proportion	-0.079***	-0.035***	-0.028***	-0.030***	-0.027***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
High Education Proportion	0.024***	0.034***	0.023***	0.033***	0.022***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

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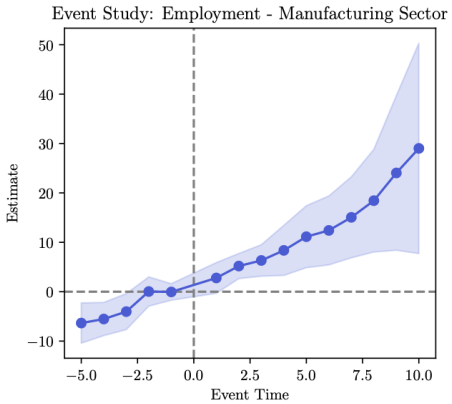
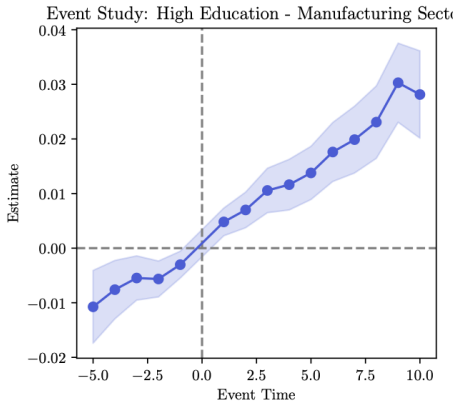
Service vs Manufacturing Effects

Manufacturing firms

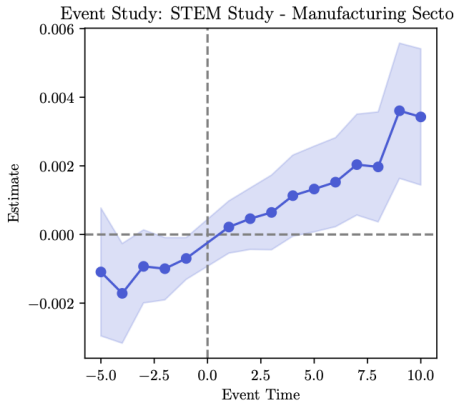
(a) Employment



(b) High education

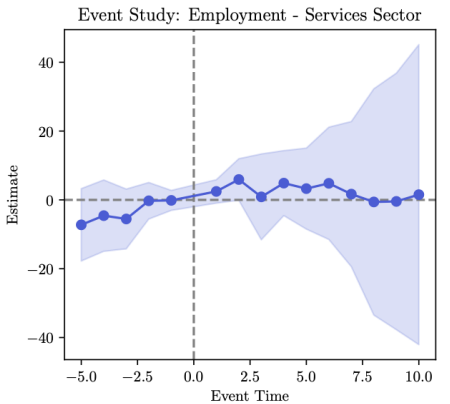


(c) STEM workers

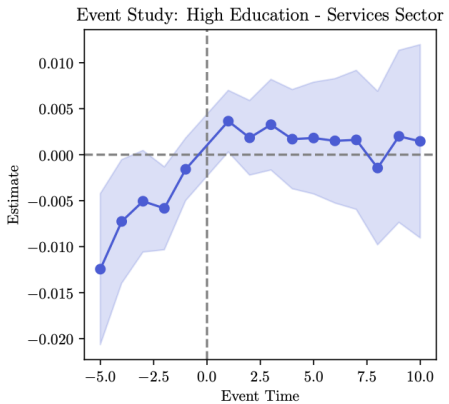


Service firms

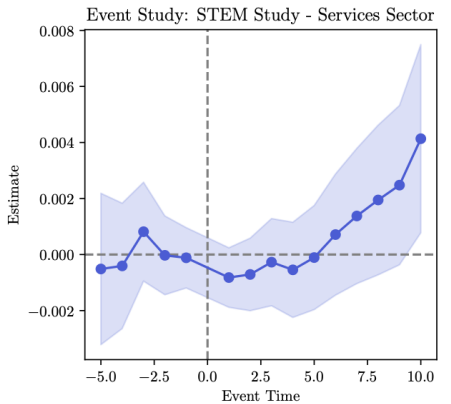
(d) Employment



(e) High education



(f) STEM workers



Notes: All series are estimated on the same sample construction as the corresponding main panel. Confidence intervals are 95%. Event time is centered at $t = 0$.

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