Wage Dynamics and Worker Sorting: Evidence from Israel's High-Tech Expansion, 2010–2022

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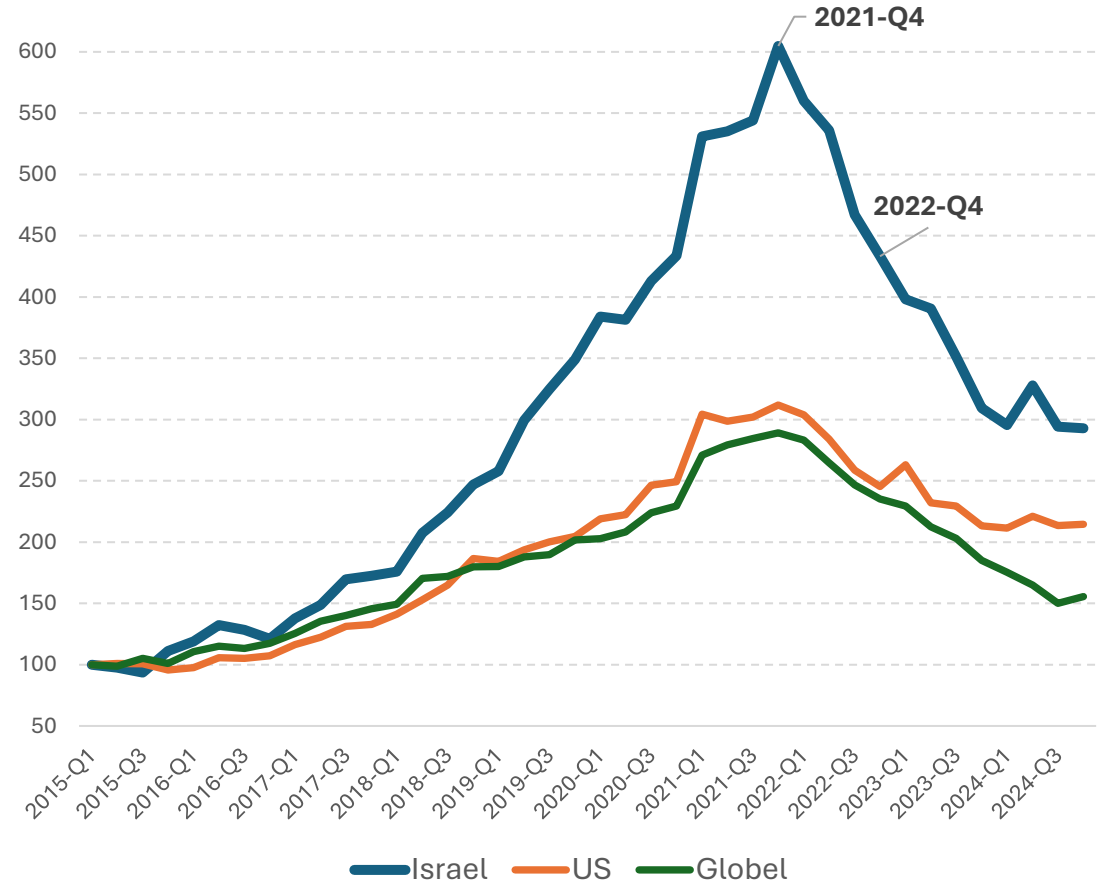
Motivation: Exceptional Growth in Israel's High-Tech Sector

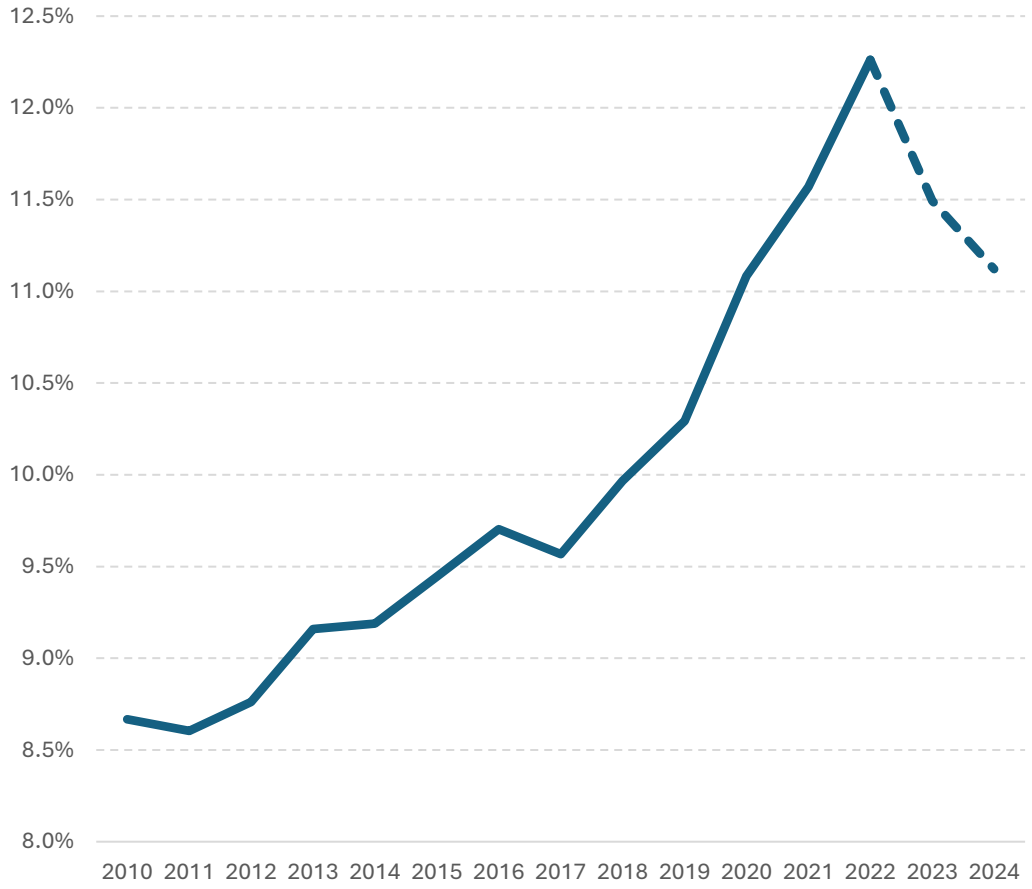
Capital Inflows as a Driver of High-Tech Expansion

Sharp rise in capital raised by tech firms, peaking in 2021, coincided with employment growth

Funds raised by High-Tech companies (2015=100)



The Share of High-Tech Employees in Israel's Business Sector, 2010-2024.



Source: Ernst and young, CBS and MOF data

Theoretical Expectations: Technology, Skills, and Inequality

What Past Evidence Suggests: kill Biased Technological Change

Higher demand for skills
(Katz & Murphy, 1992

High-skilled workers cluster in high paying firms
(Song et al. 2019)

Inequality Rises
(Autor & Acemoglu, 2011)

Superstar firms grow dominant
(Autor et al., 2017)

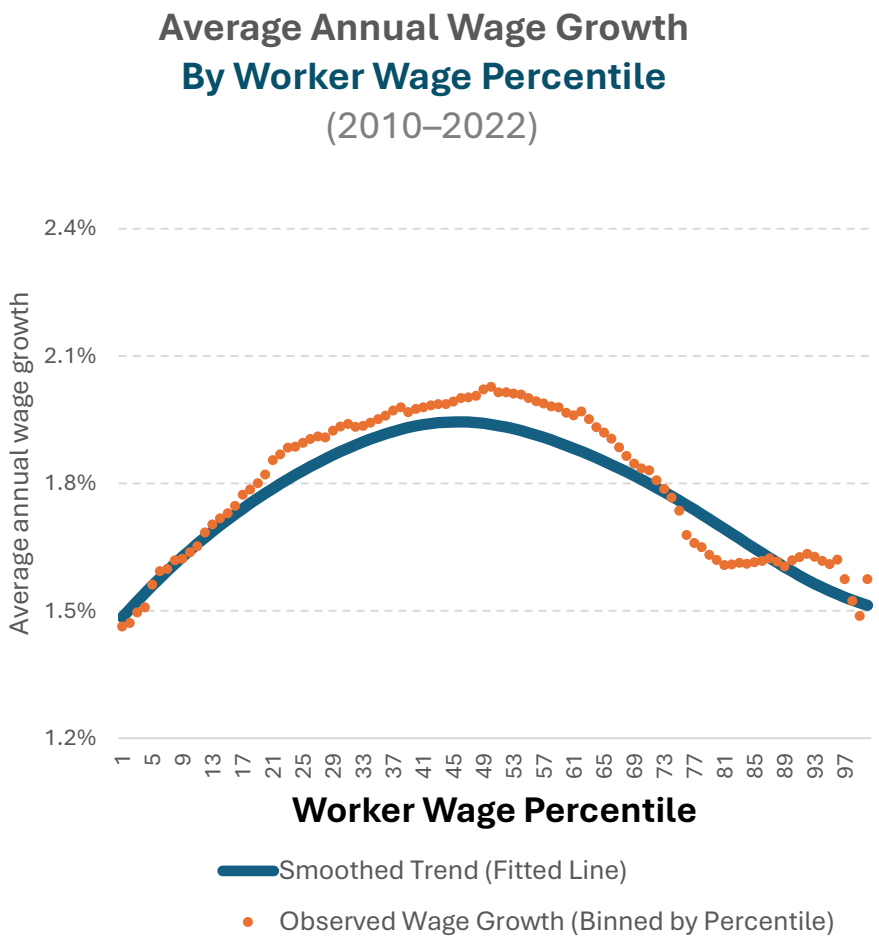
Stable Wage Variance Despite Rising Premium

Wage inequality remained stable from 2010–2022, despite high-tech wage growth

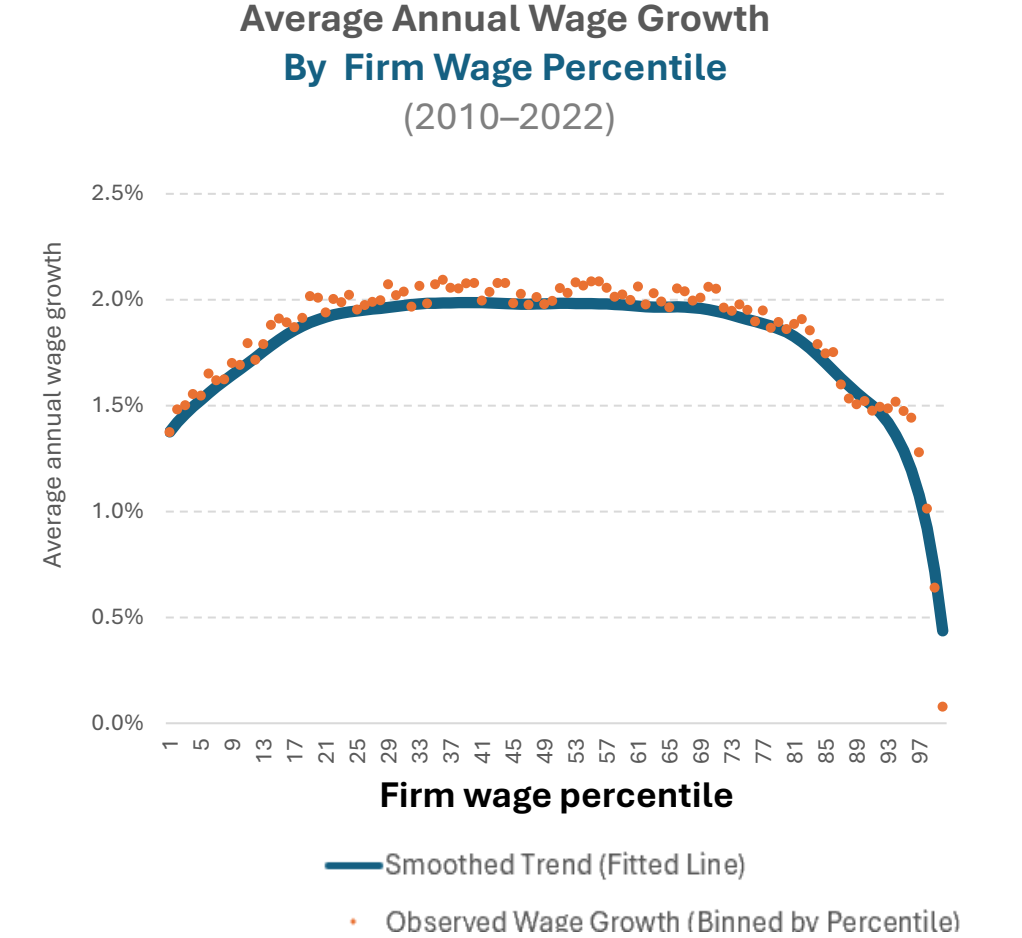
Year	Total Variance (lwage)	Within-Sector Variance	Between-Sector Variance
2010	0.41	0.37	0.04
2011	0.42	0.38	0.04
2012	0.41	0.36	0.04
2013	0.40	0.36	0.04
2014	0.40	0.36	0.04
2015	0.40	0.35	0.04
2016	0.39	0.34	0.05
2017	0.38	0.33	0.04
2018	0.37	0.32	0.05
2019	0.38	0.33	0.05
2020	0.39	0.33	0.06
2021	0.40	0.34	0.07
2022	0.42	0.34	0.08

Inclusive Reallocation To High-Productivity Firms

Middle-skilled workers shifted into top-paying firms, driving the strongest wage growth



Workforce diversification in top-paying firms reduced their average wage growth



Empirical Strategy: Matched Employer–Employee Data

We use administrative data from the Israeli Tax Authority, including:

1. Full business sector coverage, 2010–2022. Ages: 25-64
2. Administrative tax authority data: Annual reports and ownership structure combined with worker-level employment records
3. IVC High-Tech definition

Estimation Equation

Log Wage | Firm FE | Year FE

$$w_{i,t} = \alpha_i + \psi_{j(i,t)} + \beta X_{i,t} + \delta_t + \delta_t \times D + \varepsilon_{i,t}$$

Worker FE | Time varying attributes | Year FE × HT Dummy

Decomposing the High-Tech Wage Premium

Estimation Equation

Log Wage | Firm FE | Year FE

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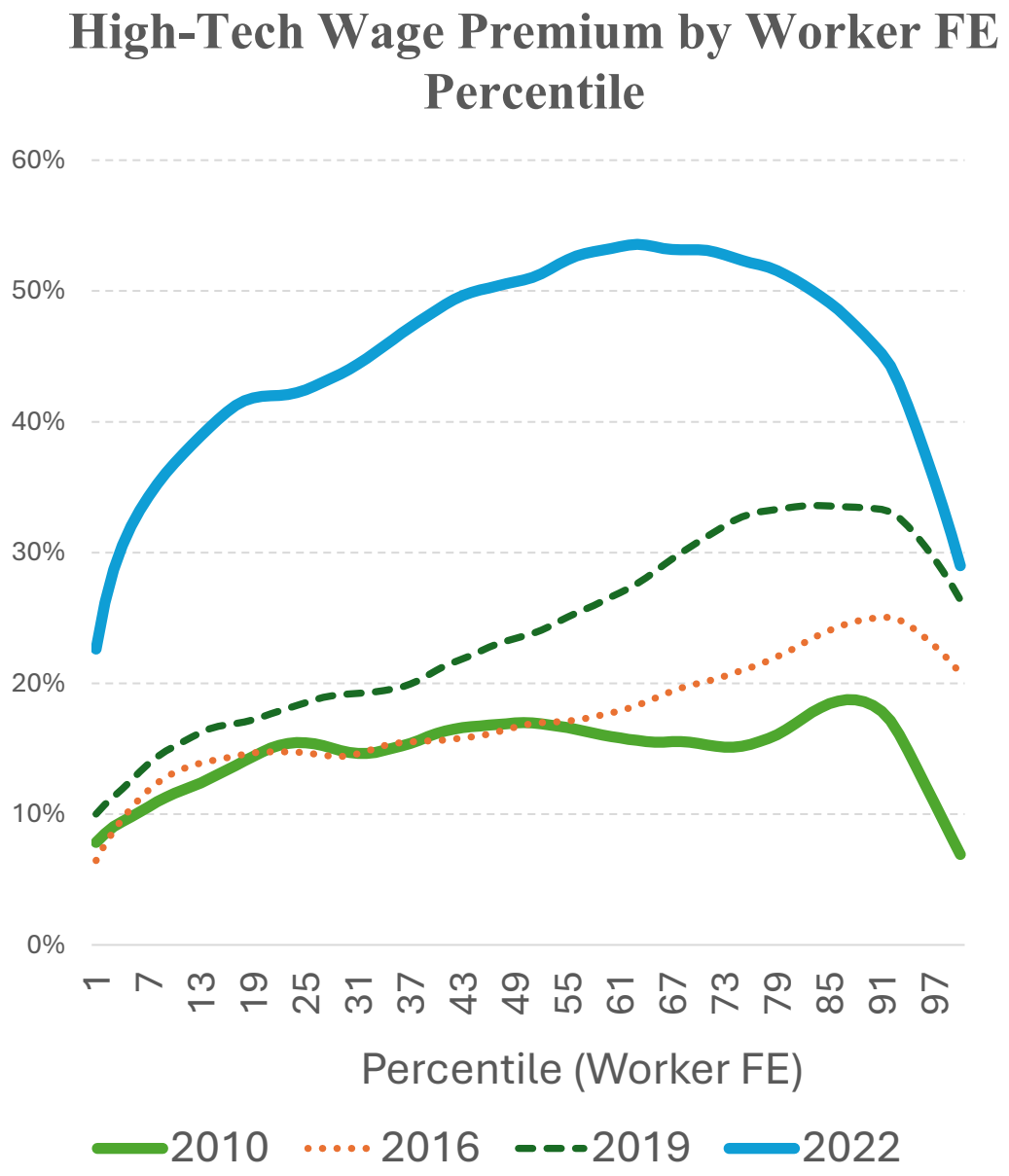
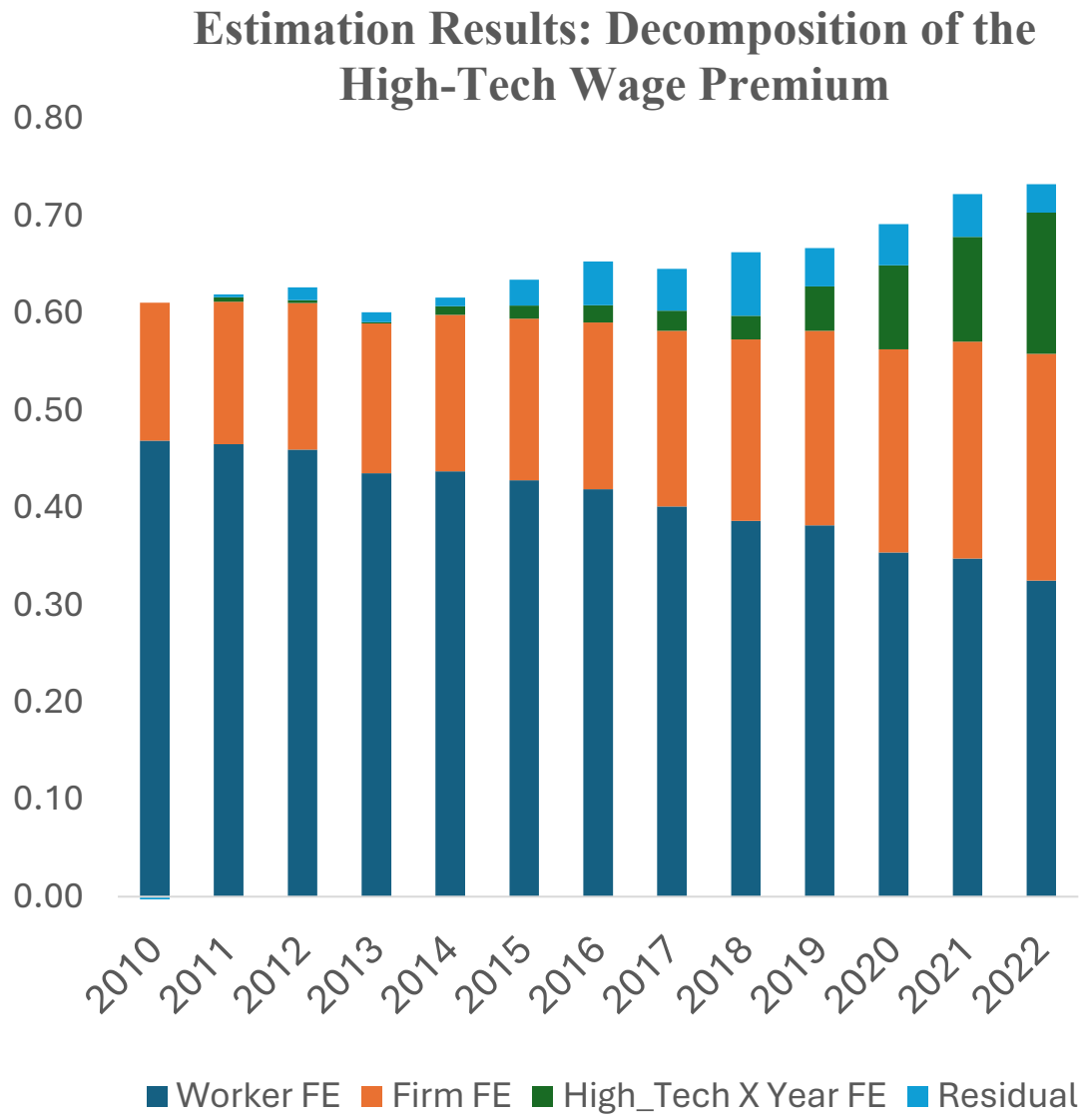


Decomposing the High-Tech Wage Premium

Estimation Equation

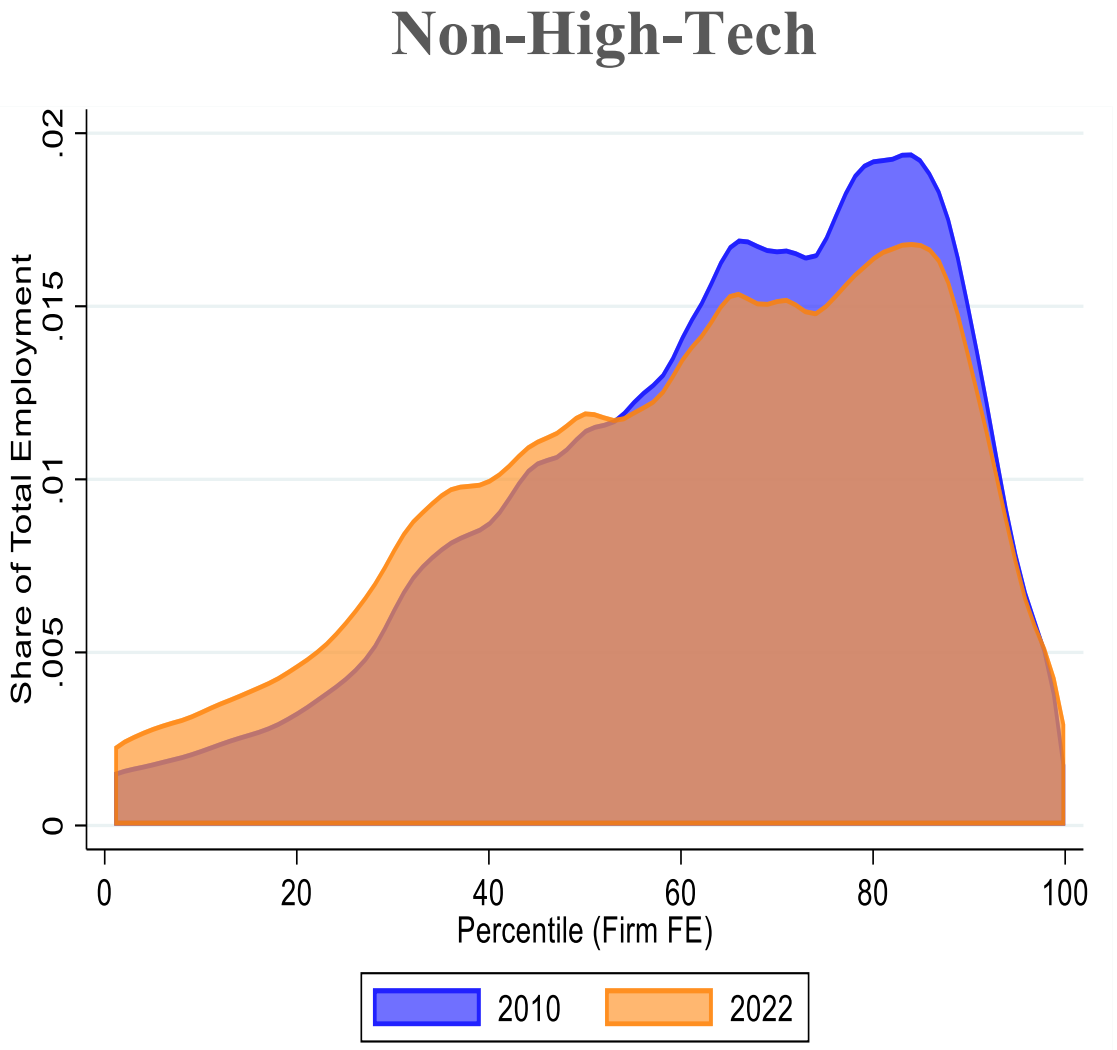
$$\underbrace{\mathbb{E}\left[\, w_{i,t} \middle| HT = 1\right] - \mathbb{E}\left[\, w_{i,t} \middle| HT = 0\right]}_{\text{High-Tech Wage premium}} = \underbrace{\mathbb{E}[\alpha_i^{HT=1} + \beta X_{it}^{HT=1}] - \mathbb{E}[\alpha_i^{HT=0} + \beta X_{it}^{HT=0}]}_{\text{Contribution of worker characteristics}}$$

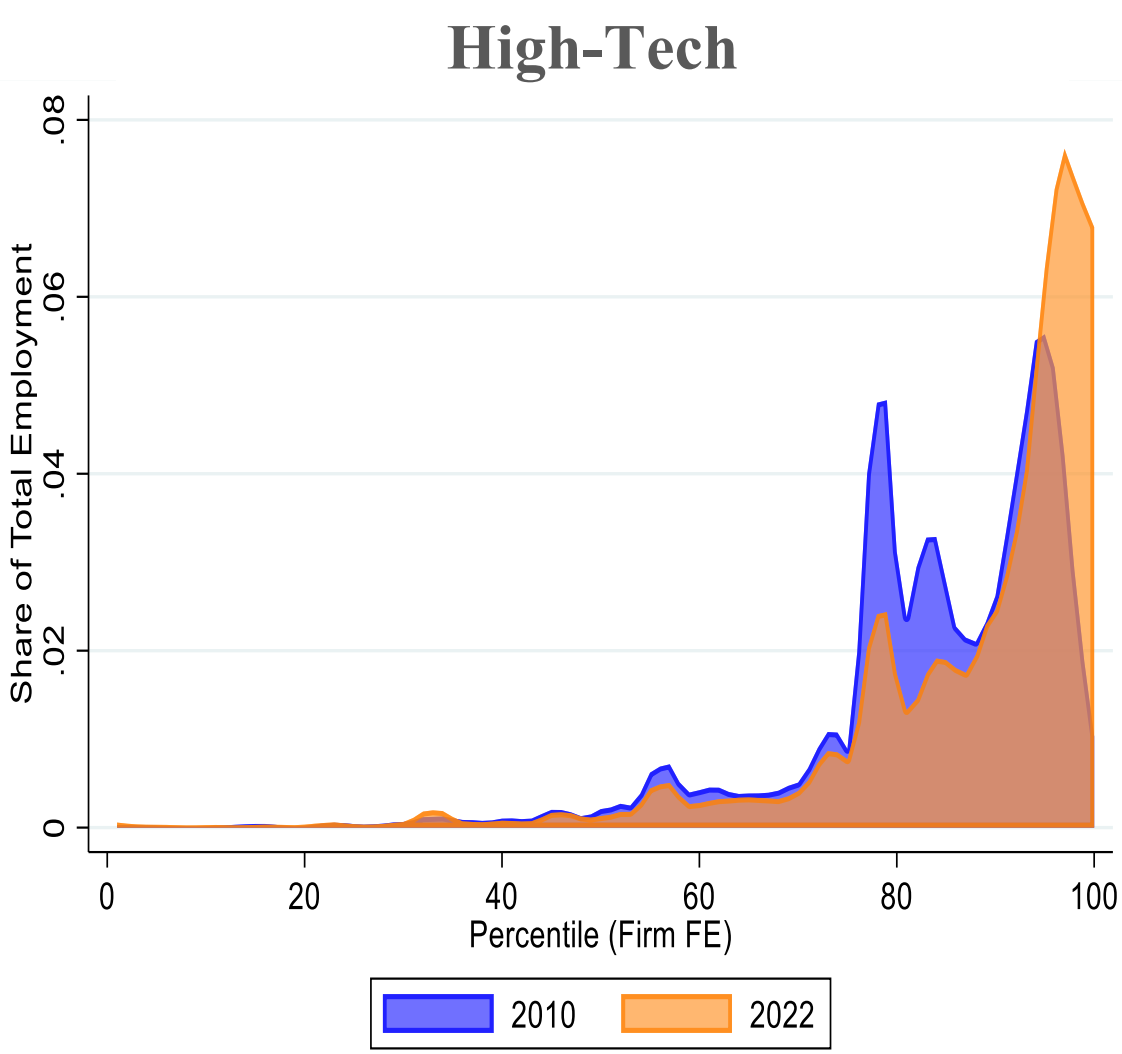
$$+\underbrace{\mathbb{E}[\psi_{j(i,t)}^{HT=1}] - \mathbb{E}[\psi_{j(i,t)}^{HT=0}]}_{\text{Contribution of firm characteristics}} + \underbrace{\delta_t \times D}_{\text{Residual HT wage premium}} + \underbrace{\mathbb{E}\left[\varepsilon_{i,t}^{HT=1}\right] - \mathbb{E}\left[\varepsilon_{i,t}^{HT=0}\right]}_{\text{Residual}}$$



Shift Towards Top-tier High-Tech Firms

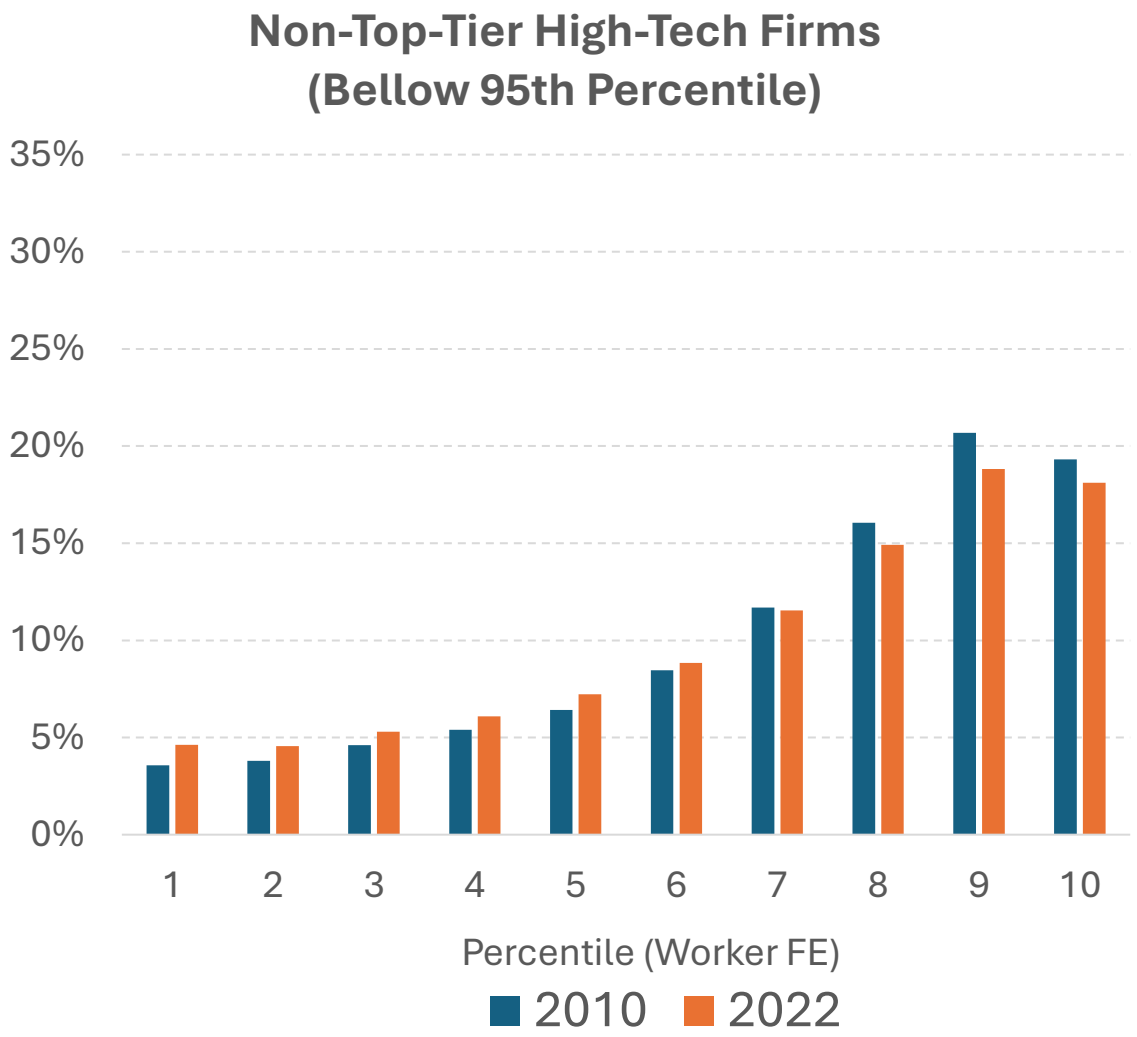
Employment Distribution by Firm FE

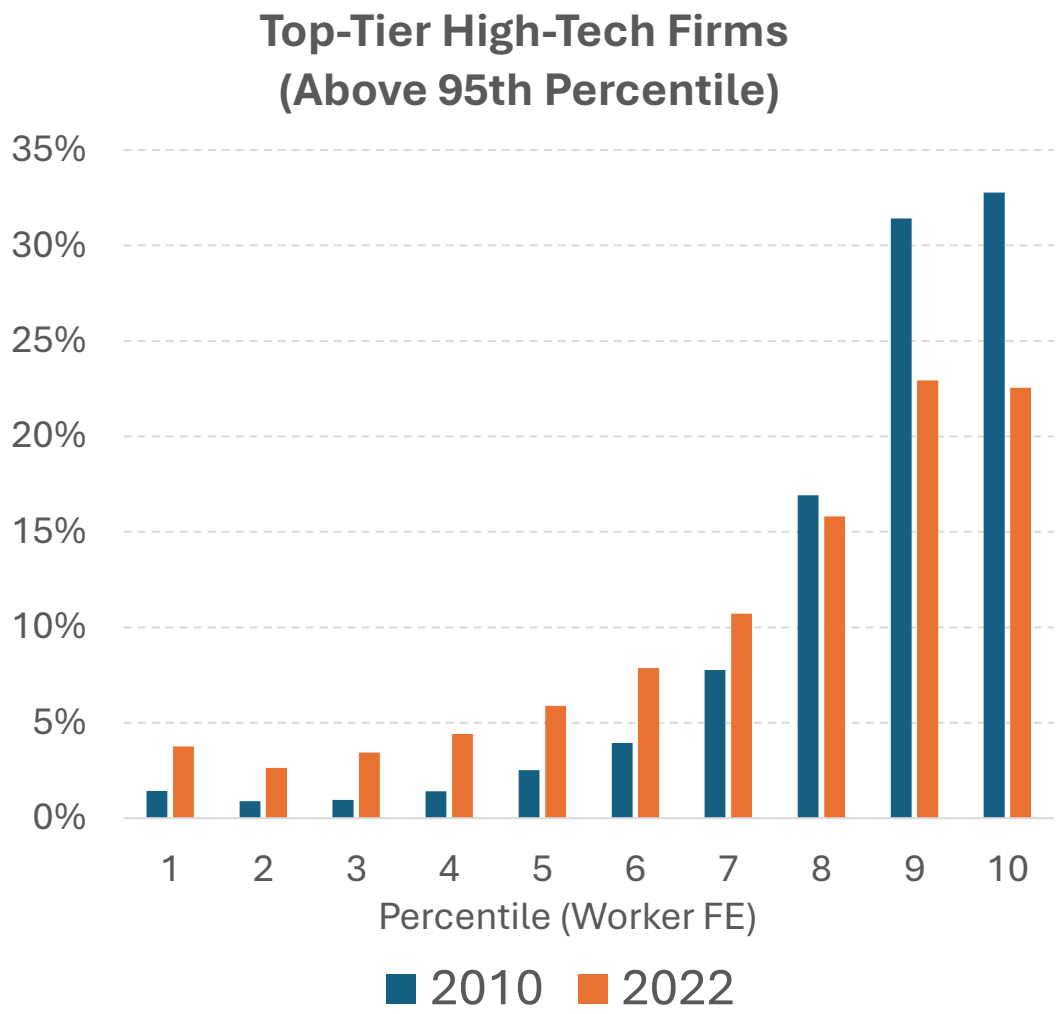




Workforce Composition Shifted Toward Middle-Skilled

Skill Composition of High-Tech Employment





Empirical Regularities

1. Rising High-Tech Wage Premium

The wage gap between high-tech and other sectors rose from 83% to 108%, yet overall inequality remained stable due to declining within-sector variance.

2. Broad-Based Wage Gains

Wage growth extended beyond top-skilled workers, benefiting mid- and lower-skilled employees as well—indicating a more inclusive pattern than predicted by traditional SBTC models.

3. Reallocation to Top-Tier Firms

Nearly all net job growth occurred in firms above the 95th percentile of firm fixed effects—larger, more productive, often multinational companies.

4. Inclusive Hiring Among Top-Tier Firms

As these leading firms expanded, they began hiring from a broader skill range, shifting workforce composition toward the middle of the skill distribution.

Model (inspired by Krusell et al., 2000)

Two-Sector Economy: High-Tech and Low-Tech

1. **Production**
   Both sectors produce an identical good and operate constant-returns-to-scale CES production functions .
   Firms in both sectors employ labor of two worker types, trained and untrained.

2. **Worker Types**

- Untrained workers are all identical.
- Trained workers are endowed with idiosyncratic ability drawn from some distribution.
- Ability manifests itself only in High-Tech.
- Idiosyncratic preference shocks induce high-ability workers to prefer Low-Tech.

Why Did the High-Tech Sector Expand? A Model-Based Interpretation

Main Mechanism: Productivity Shock and Endogenous Inclusion

1. A **positive TFP shock** in the high-tech sector (e.g., technological innovation, capital inflows) raises its workers' marginal productivity.

2. This increases demand and **lowers the threshold ability** at which trained workers qualify to enter high-tech employment.

3. Moreover, **participation expands along the ability distribution** — not just among top-skilled workers, but also mid- and lower-skilled ones.

4. **Untrained workers**, are also increasingly absorbed.

Brain Drain

Brain Drain: The Cost of Losing Top Talent

1. In the model, removing top-ability workers (e.g., due to **migration**) shifts the ability distribution **leftward**.

2. This sharply reduces **both** total output and the **High-Tech sector share.**

3. **Implication**: A small group of highly skilled workers accounts for a disproportionate share of economic value—particularly in High-Tech.

4. **Preserving top talent is critical** not just for sectoral gains, but for aggregate output.

Shifting Ability Distribution

Exercise:

Remove mass from the top to render original p^{th} percentile to 99^{th} percentile