Tech occupations and labor market mismatch: Trends, challenges and policy

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Topics

- Macroeconomic Strategy
- Tech Occupations
- Labor Market Mismatch
- Employment and Human Capital Policy

Macroeconomic Strategy

Aaron Institute for Economic Policy

Vision: Support sustainable economic growth and social resilience,
along with poverty reduction,
by designing a strategy based on measurable, internationally-comparable targets,
and proposing detailed plans for economic policies
based on the most updated international knowledge.

Focus on reforms towards economic growth stemming from
increasing employment and raising GDP per hour worked (labor productivity).

Aaron Institute macroeconomic strategy

- **Measurable targets:** increased GDP per capita and reduced poverty
- Based on **comparing** Israel to leading countries ("the benchmark countries"*)

- Work plans to attain targets, based on **macro-economic analysis and current data**, in cooperation with the government and with ongoing monitoring

* Similar population size and economic structure (human capital based growth).

Benchmark countries:
higher GDP per capita, lower poverty rate

	Israel	 Sweden	 Netherlands	 Finland	 Denmark	 Austria
GDP per Capita* 2021	42.2K $		52.9K $			
Poverty Rate** 2019	17%		8%			

* 2015 prices, PPP. * After taxes and transfers.
Source: Aaron Institute calculations based on OECD data.

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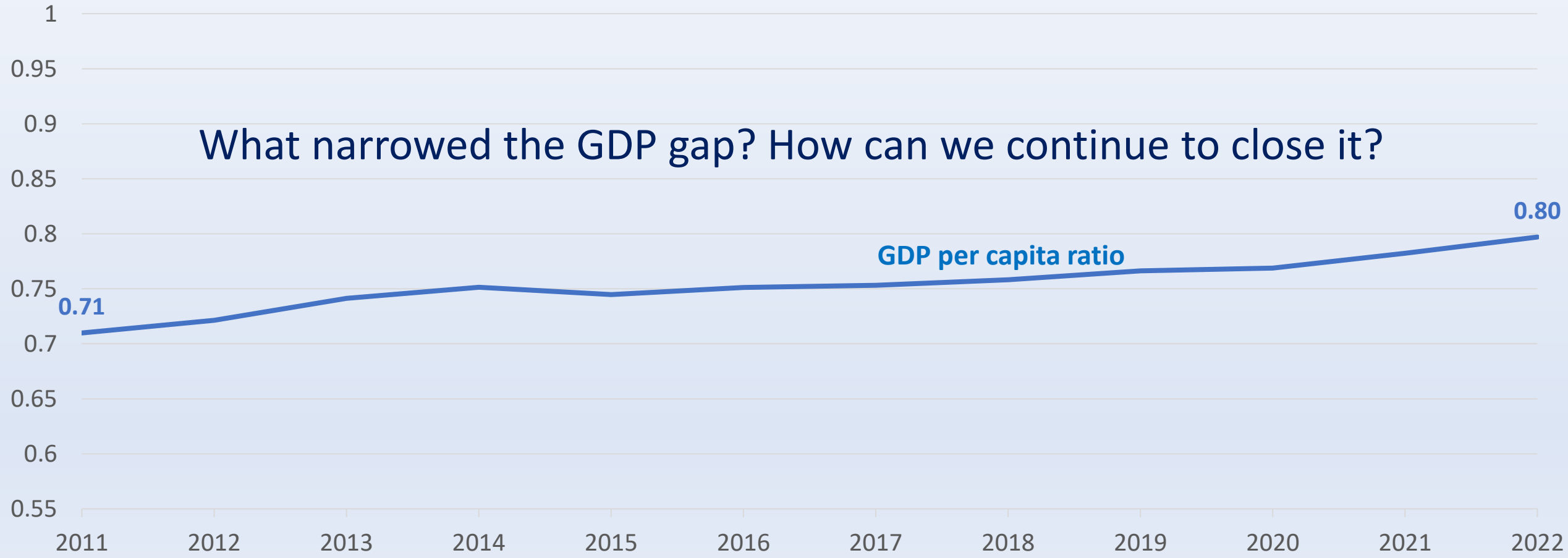
GDP per capita gap:
Down from 29% in 2011 to 20% in 2022

Ratio of GDP per capita, employment rate and labor productivity between Israel and the benchmark countries



2015 prices, PPP.
Source: Aaron Institute calculations based on OECD data.

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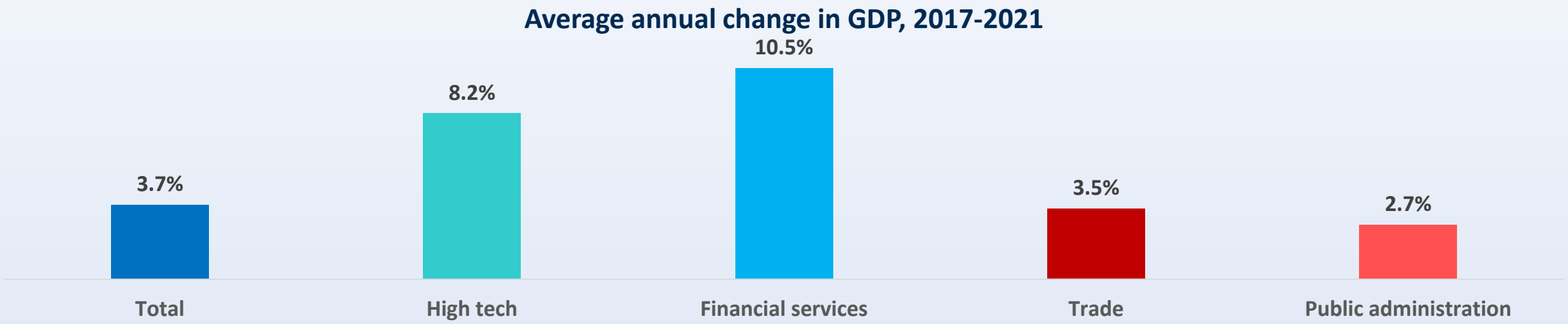
High growth since 2017: 2.3% in GDP per capita

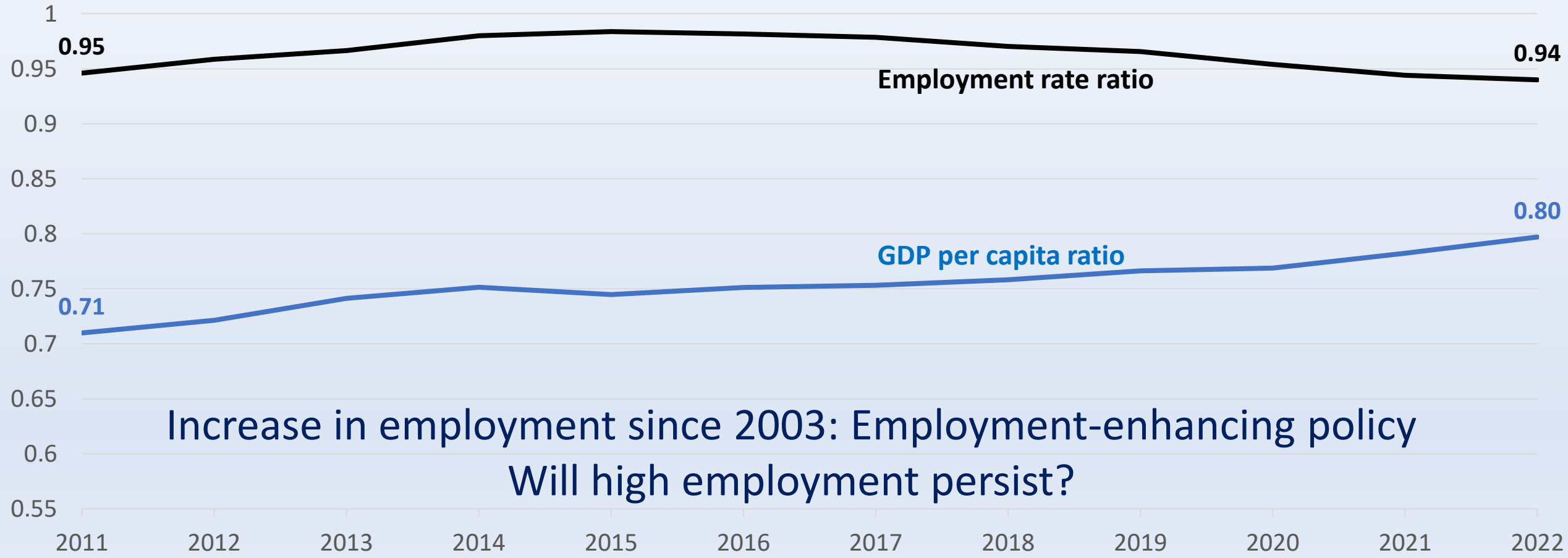


- **Growth engines:**
  - High Tech sector: 17% of GDP, 40% of GDP growth
  - Financial services sector: 5% of GDP, 12% of GDP growth
- Public administration: 19% of GDP, 14% of GDP growth - **a "weight" on growth**

High tech: Manufacturing and services, inc. workers in non-technological occupations.
Public administration: Inc. local administration, education, health and social work.
Source: Aaron Institute calculations based on CBS data.

Employment rate:
Almost the same as benchmark countries

Ratio of GDP per capita, employment rate and labor productivity between Israel and the benchmark countries



Increase in employment since 2003: Employment-enhancing policy

Will high employment persist?

2015 prices, PPP.

Source: Aaron Institute calculations based on OECD data.

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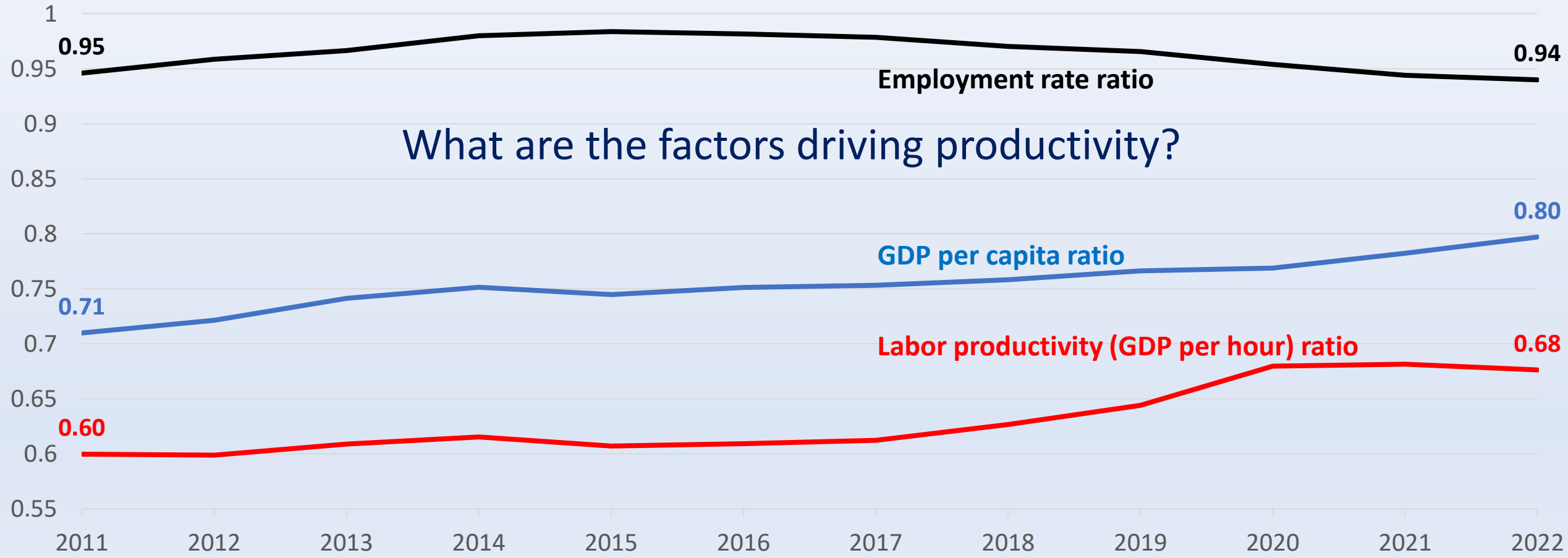
Labor productivity gap: Down to 32% in 2022

Ratio of GDP per capita, employment rate and labor productivity between Israel and the benchmark countries



2015 prices, PPP.

Source: Aaron Institute calculations based on OECD data.

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Productivity gap is still large:

GDP per hour in Israel 24$ lower than benchmark

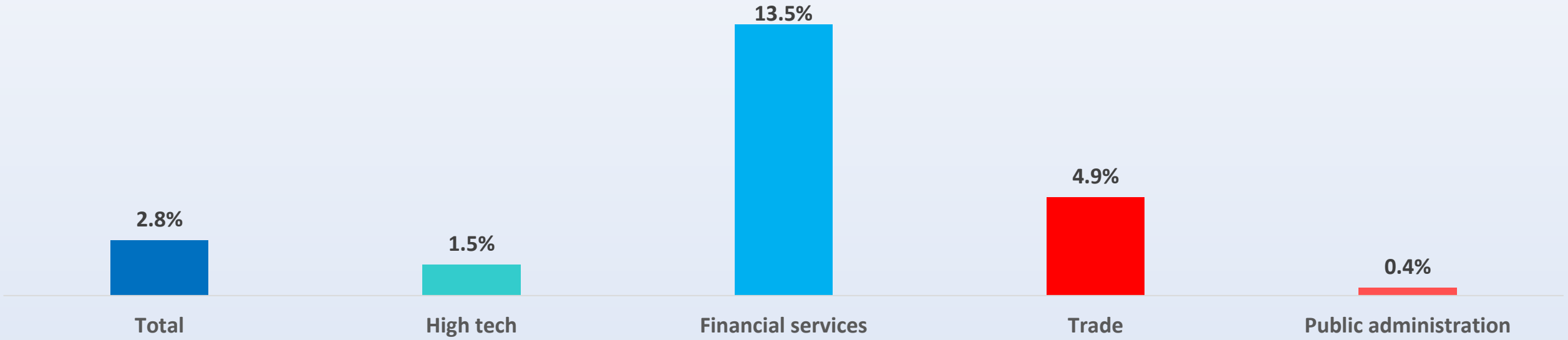
Human capital**		Private capital per hour		Public ICT capital per capita		Public capital per capita		TFP		GDP per hour gap*
6.4$	+	5.4$	+	0.3$	+	7.5$	+	4.6$	=	24.2$
27%	+	22%	+	1%	+	31%	+	19%	=	100%
88%		54%		81%		34%				Stock - % of benchmark countries

Lower productivity in sectors employing lower-half workers

* Average gap in GDP per hour for 2017-2021. ** Based on the OECD PIAAC survey.
Source: Aaron Institute analysis based on OECD and IMF data.

65% of the GDP growth since 2017: Increase in labor productivity

Average annual change in Productivity, 2017-2021



Financial services: 10.5% increase in GDP , 2.6% **decrease** in employment - huge jump in productivity

Source: Aaron Institute calculations based on CBS data.

65% of the GDP growth since 2017: Increase in labor productivity

High tech stimulates increase in productivity and wages in other sectors - **innovation, competitiveness, efficiency**

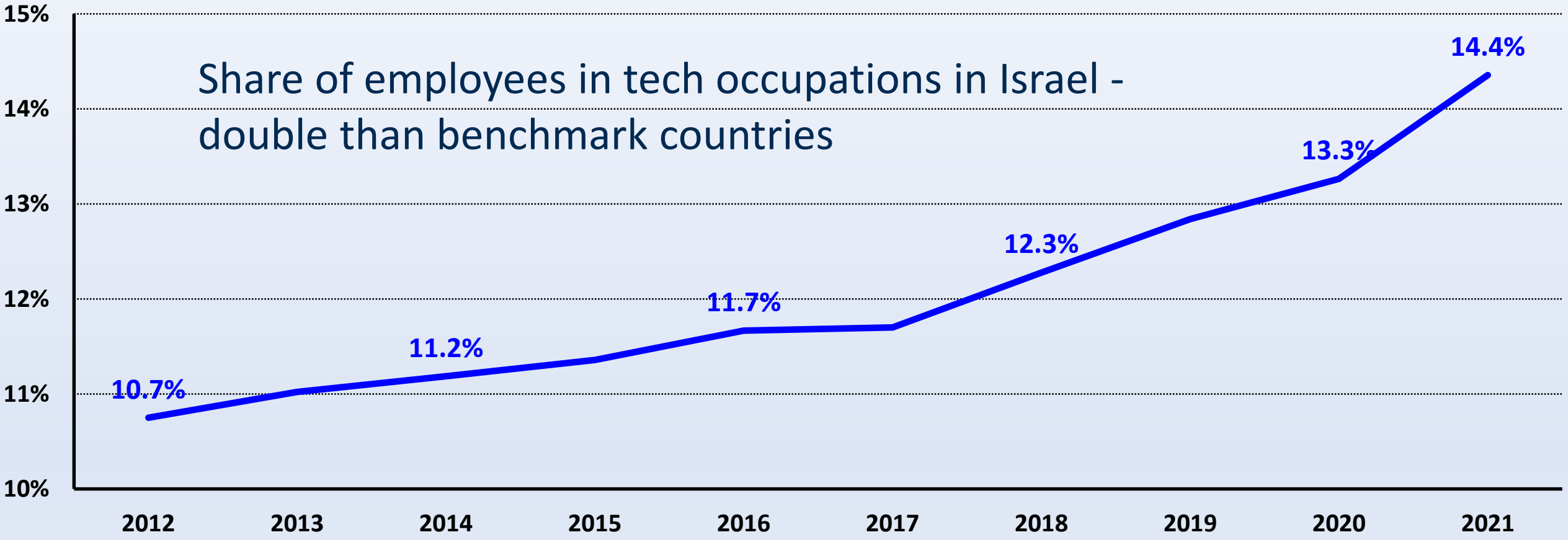
Main human capital channel for GDP and productivity growth:

increase in tech occupations employment

Tech Occupations

Increase in tech occupations employment in 2017-2021: Number of employees up 6.3%

Share of employees in tech occupations*



* Managers, professionals, practical engineers and technicians in ICT or science-related occupations (e.g. physics, product management, BI, communication and web).
Figure for ages 25-64, benchmark countries comparison for ages 15+.
Source: Aaron Institute calculations based on CBS and EU data.

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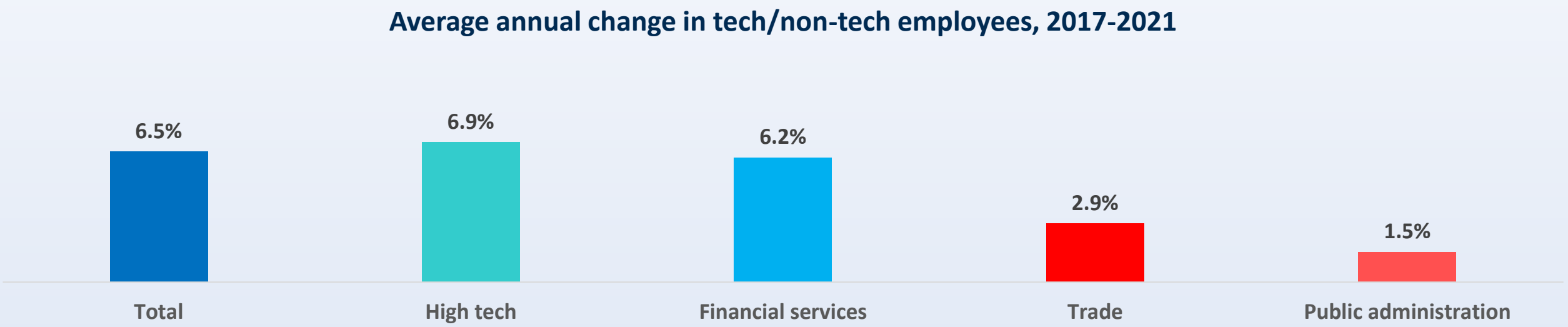
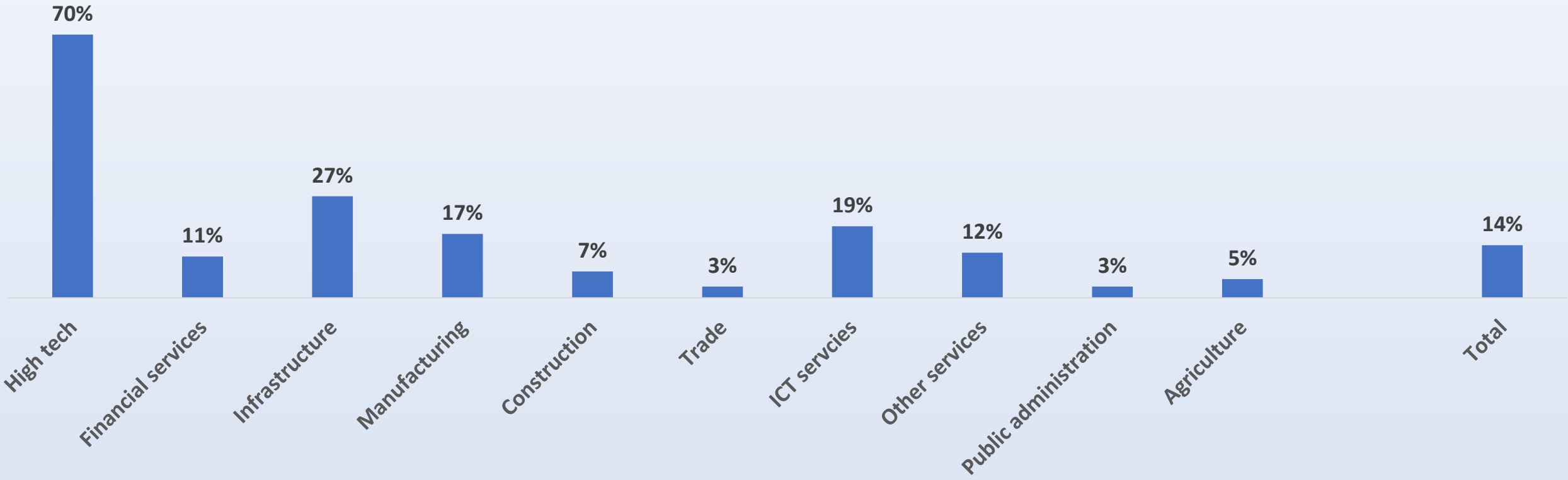
Increase in the ratio of tech/non-tech employees



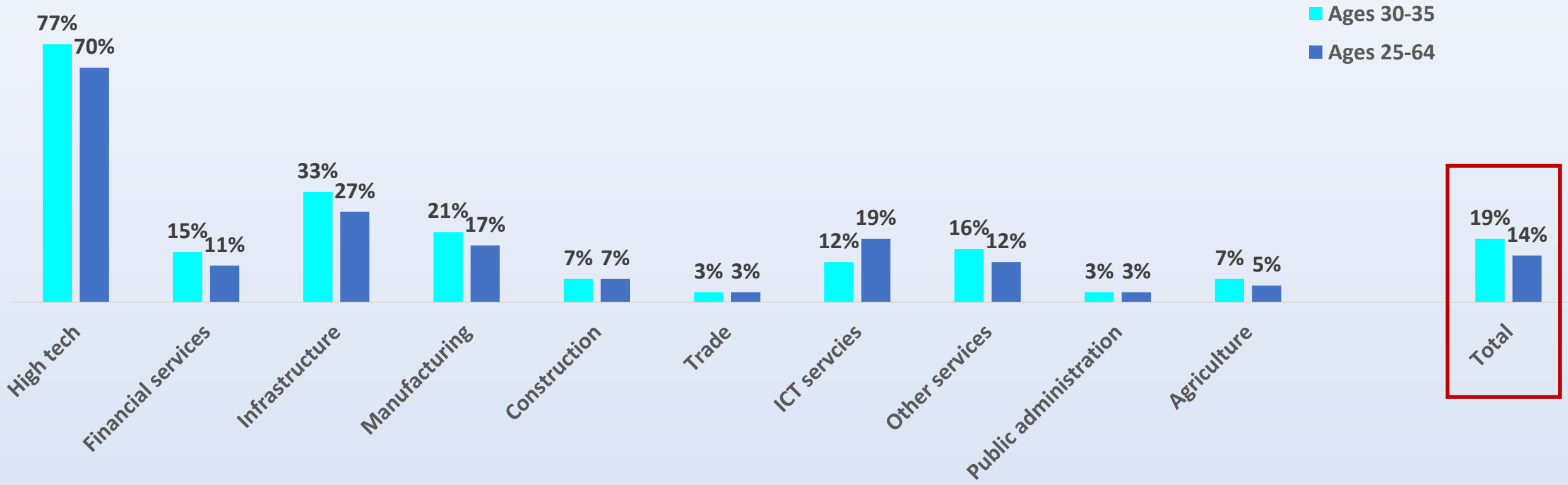
Especially in the high tech and financial services sectors

Share of employees in tech occupations: Extremely low in trade and public administration



Ages 25-64.
Source: Aaron Institute calculations based on CBS data.

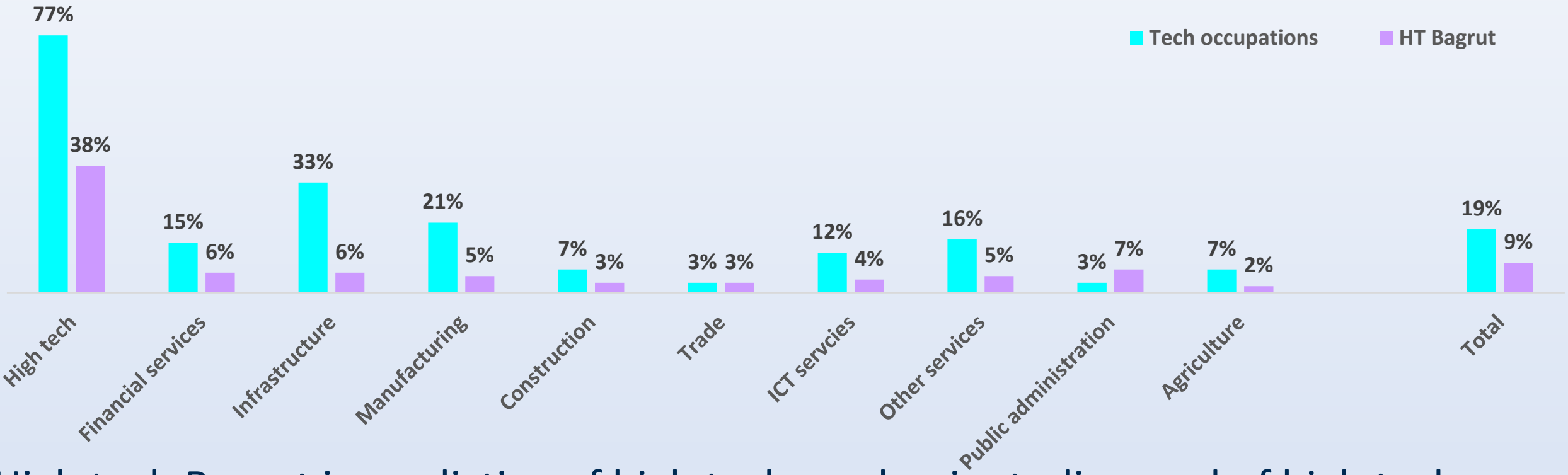
Share of employees in tech occupations: Higher for younger workers



Source: Aaron Institute calculations based on CBS data.

Key characteristic of employees in tech occupations: High tech matriculation (Bagrut)

Share of employees in tech occupations, 2021, and share of High tech Bagrut*, 2019



High tech Bagrut is predictive of high tech academic studies, and of high tech employment

* 5 study units math + 5 English + 5 physics/computer science.
Ages 30-35.
Source: Aaron Institute calculations based on CBS data.

Labor Market Mismatch

15% of workers report job-qualifications mismatch

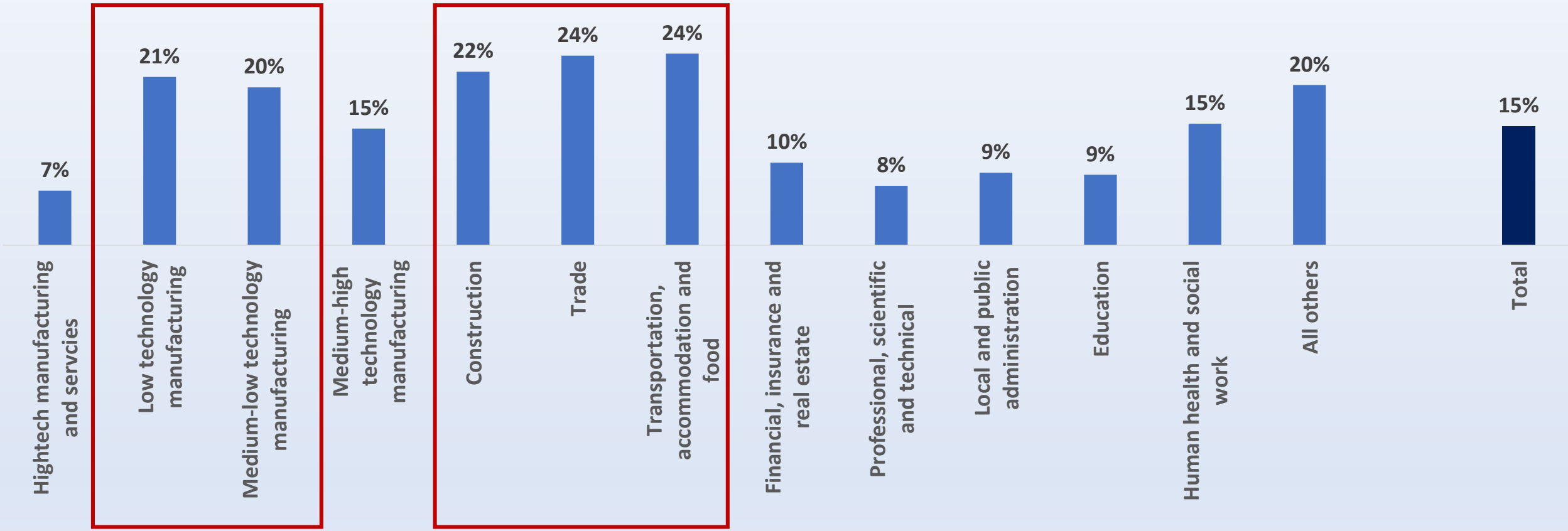
Based on the Labor Force Survey question:

“Does your job match your education and training?”

Higher match rates are correlated with higher wages and labor productivity

Higher mismatch in low-productivity sectors: Traditional industry, construction, trade and commerce

Share of employees reporting mismatch between their job and their education/training, 2021

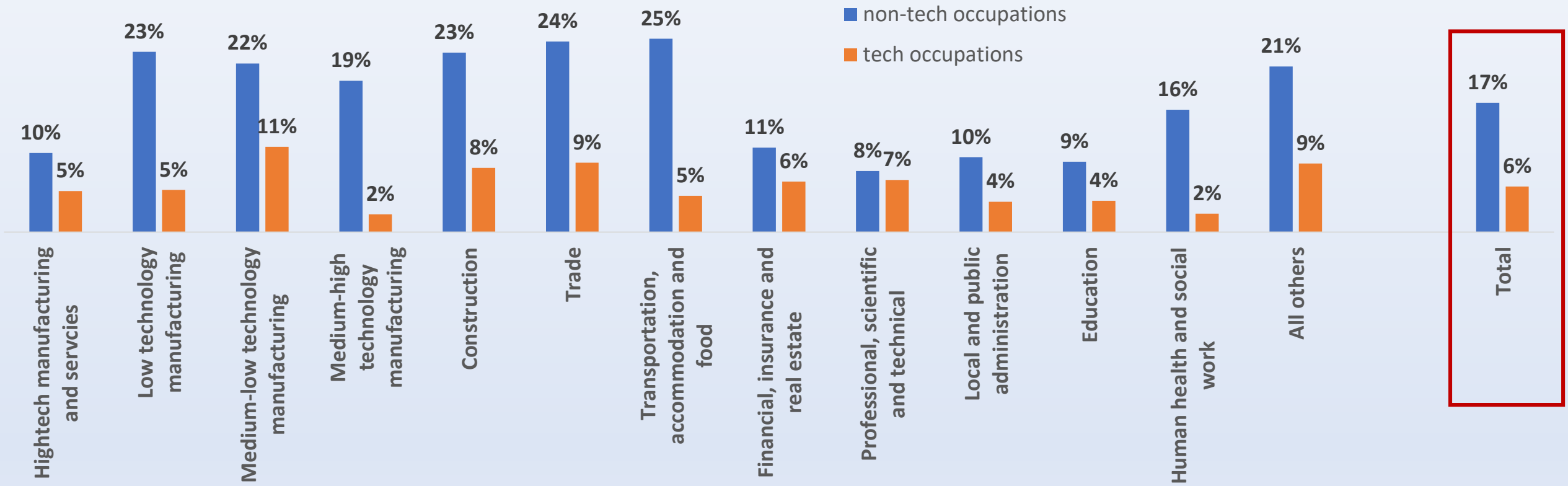


Ages 25-64.

Source: Aaron Institute calculations based on CBS data.

Mismatch is much lower for employees in tech occupations across all sectors

Share of employees reporting mismatch between their job and their education/training, 2021

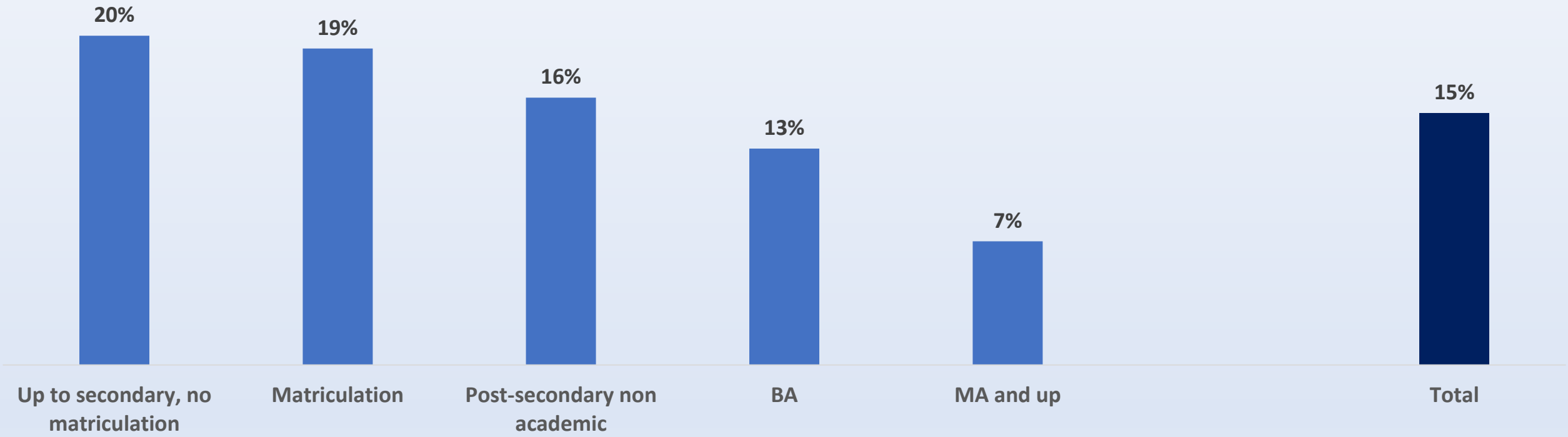


Ages 25-64.

Source: Aaron Institute calculations based on CBS data.

Mismatch decreases with education level

Share of employees reporting mismatch between their job and their education/training, 2021



Ages 25-64. Education level based on highest certificate.
Source: Aaron Institute calculations based on CBS data.

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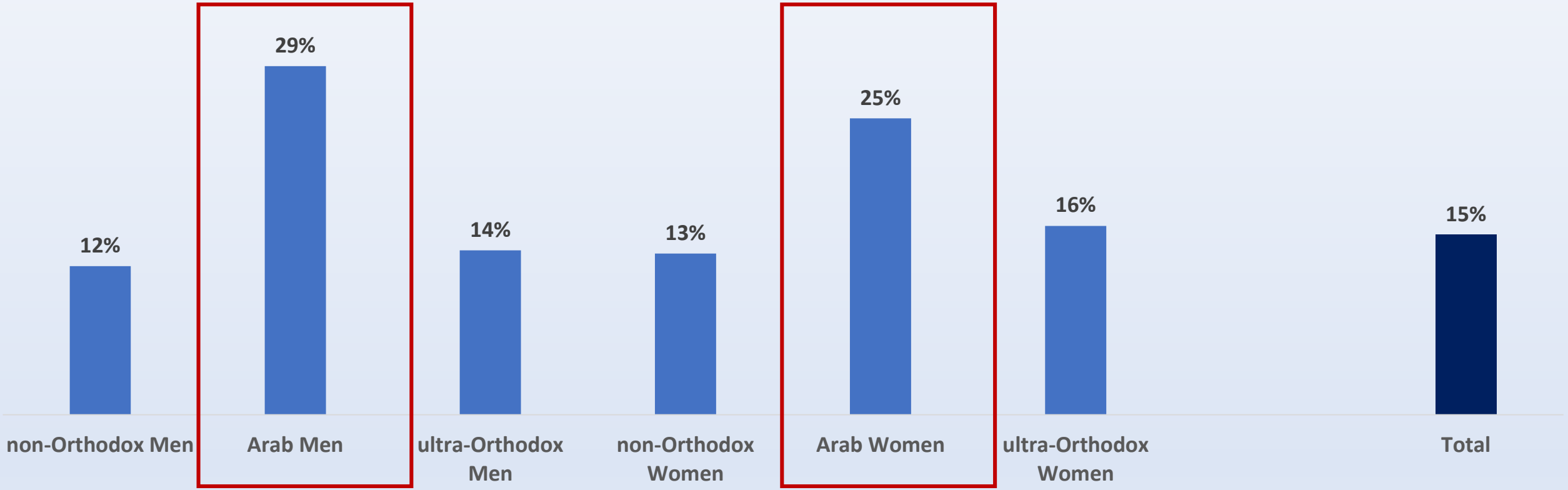
Mismatch is much higher for Arab workers

Share of employees reporting mismatch between their job and their education/training, 2021

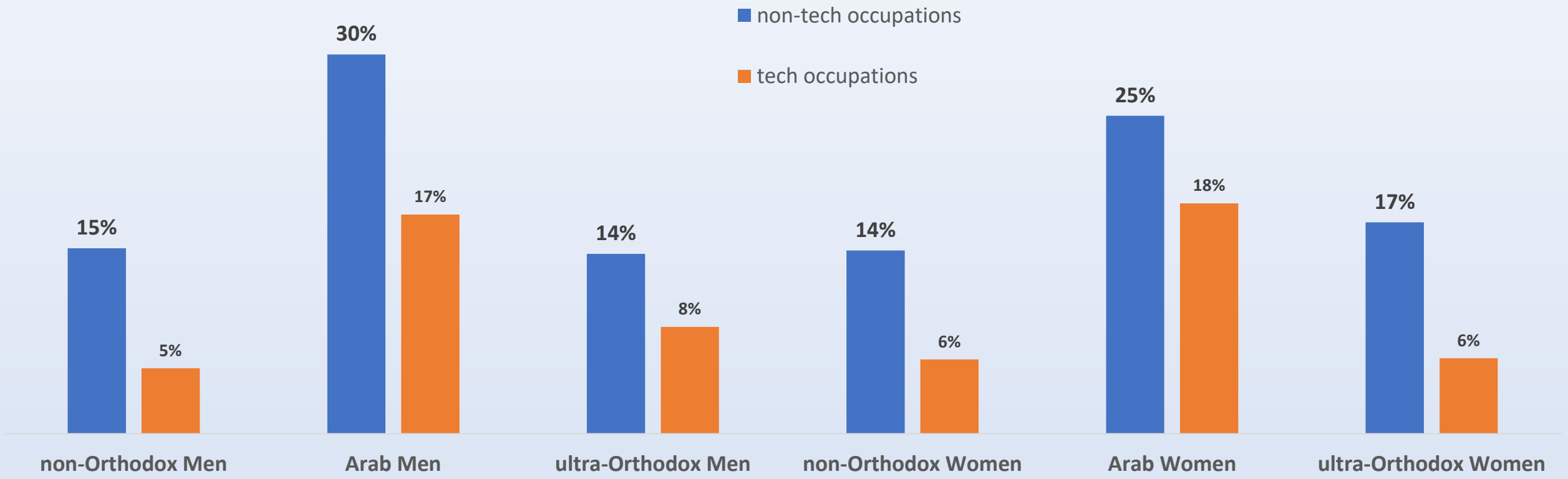


Ages 25-64.
Source: Aaron Institute calculations based on CBS data.

Higher mismatch for Arab workers:

In non-tech and tech occupations

Share of employees reporting mismatch between their job and their education/training, 2021



Higher mismatch for Arab workers also within each education level

Ages 25-64.

Source: Aaron Institute calculations based on CBS data.

Employment and Human Capital Policy

Policy Derived from macroeconomic analysis

Long-term reforms including targets, programs and budget for maintaining high employment rate while raising labor productivity

01 **Investment in human capital** — 2030 committee, technological and vocational training, human capital targets

02 **Massive investment in public capital** — 2040 targets to reduce transportation accessibility gaps

03 **Raising desirability of private investments** — Digital transformation, competitiveness, reduce bureaucracy, cost of living

Most of the growth in productivity will reach the lower half of the population and reduce poverty

Quality employment and human capital challenges

Functioning labor ministry

Coordinated policy and regional management:
adjusted to populations, employers and workers

Human capital for the lower half

K-12 education, technological and vocational training, academic education, skills:
Arabs
ultra-Orthodox
Periphery
Labor market entrants with no post-secondary education

High employment for all

Return to trajectory towards 2030 targets:
ultra-Orthodox men
Arab men and women
Disabled

Employment programs: raise human capital through work experience

Incentives for employment and education

High employment for all: Employment Programs

Build employment boosting programs for large volume of participants (one-stop centers):

- **Vocational evaluation and guidance** towards work, education, and training
- Adapting **workers' skills** to employment market needs, with an emphasis on soft and basic skills (Hebrew and digital)
- **Ongoing support** for training, active job search and placement
- **Involve employers** from all sectors
- Programs to overcome specific groups' barriers
  - E.g. Gap year for Arabs - evaluation and guidance in high school, complete basic skills, acquire soft skills
- Program evaluation, assessing effectiveness and cost-benefit

Human capital: K-12 education and tech skills

K-12 education system main target: prepare <u>all students</u> for post-secondary education and employment, addressing different populations' barriers

- **Targets for High tech Bagrut** (5 study units math + 5 English + 5 physics/computer science) - from 9% in 2021 to 15% in 2028, sub-targets by population and gender
- **Close gaps in basic skills** - Hebrew, English and math (incentives and budgets)
- Acquire **"PISA skills"** (soft skills) - problem solving, interpersonal communication, teamwork, critical thinking, creative thinking, self-learning
- Offer **STEM and programming** extracurricular activities (including informal education)
- **Reform English studies** - 5 units students should be able to have a conversation, present a topic and debate

Human Capital: Vocational & Tech. Training - 2030 reform

Target: quality post-secondary vocational and technological training as in benchmark counties - main mechanism to increase productivity and wages, esp. for the lower half:

- Adjust supply of subjects and courses **to actual market demand** (occupations and skills) - requires data and NQF ad in benchmark countries
- Reduce population specific barriers
- **Quality criterion** - minimum 6% wage return for 400 hours or longer
- Incorporate **general human capital** to close basic skill gaps (Hebrew, English, math)
- **Involve employers** in defining required skills, updating syllabus and internships
- Expand volume of participants in quality programs to **~40% of cohort** - targets by population and gender
- Quality-based **supervising (not managing) system** - flexibility and independence
- **Accreditation continuity** with no glass ceiling - requires NQF

Human capital: Academic education and tech skills

Target: Expand volume of "high tech degree" graduates, and enhance employment of all academics in the high tech sector:

- Add **data science and programming** courses
- Add study programs for **product managers and BI**
- **Teaching in English** - speaking, writing and presenting
- **Internships and practicum** to acquire experience

Ministry of Labor: integral, regional, data-driven management (Danish model)

- **Ministry of Labor:** coordinated management of policy implementing 2030 committee, integral management of all employment enhancing programs and vocational training
- **Regional and local one-stop employment centers:** single POC with unified policy for unemployed, non-employed, workers and employers; overall regional review of employment and productivity challenges, inc. urban development and transportation
- **CRM platform** incl. "personal file" and guidance data, on a national and regional level
- Accurate and up-to-date labor market data, including **demand and supply trends by occupation**, accessible to workers, job seekers, employers and training agencies - **necessary condition to adapt workers' skills and reduce labor market mismatch**

Quality employment and human capital challenges

The vision of investment in human capital:

Increase households' work income for the lower half and the entire economy - inclusive growth, social mobility and poverty reduction

Thank you