The Effects of High-Skill Immigration on Productivity and Labor Markets: The Case of Israel

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Israel: "The Start-Up Nation"

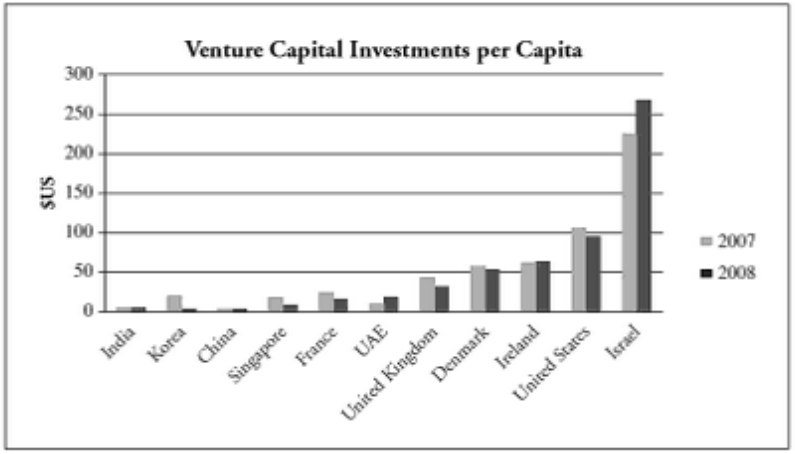


FIGURE I.1. *Sources:* Dow Jones, VentureSource; Thomson Reuters; U.S. Central Intelligence Agency, *World Fact Book*, 2007, 2008.

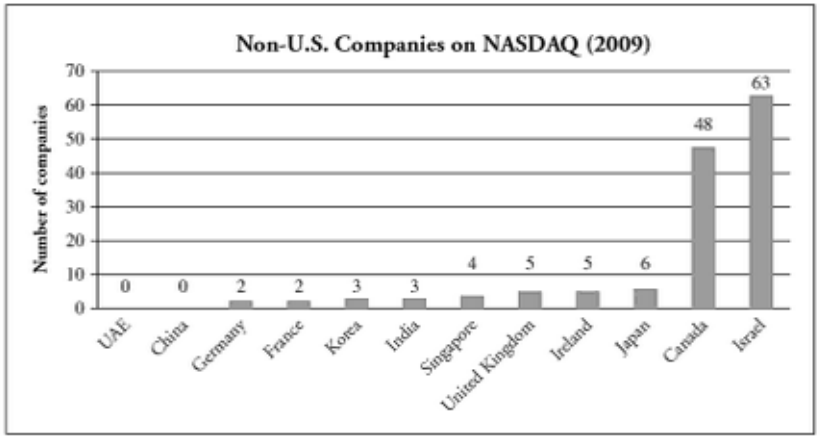


FIGURE I.2. *Source:* NASDAQ, http://www.nasdaq.com/asp/NonUsOutput.asp, May 2009.

Source: Senor and Singer (2009), *"Start-up Nation"*

The Start-up Nation

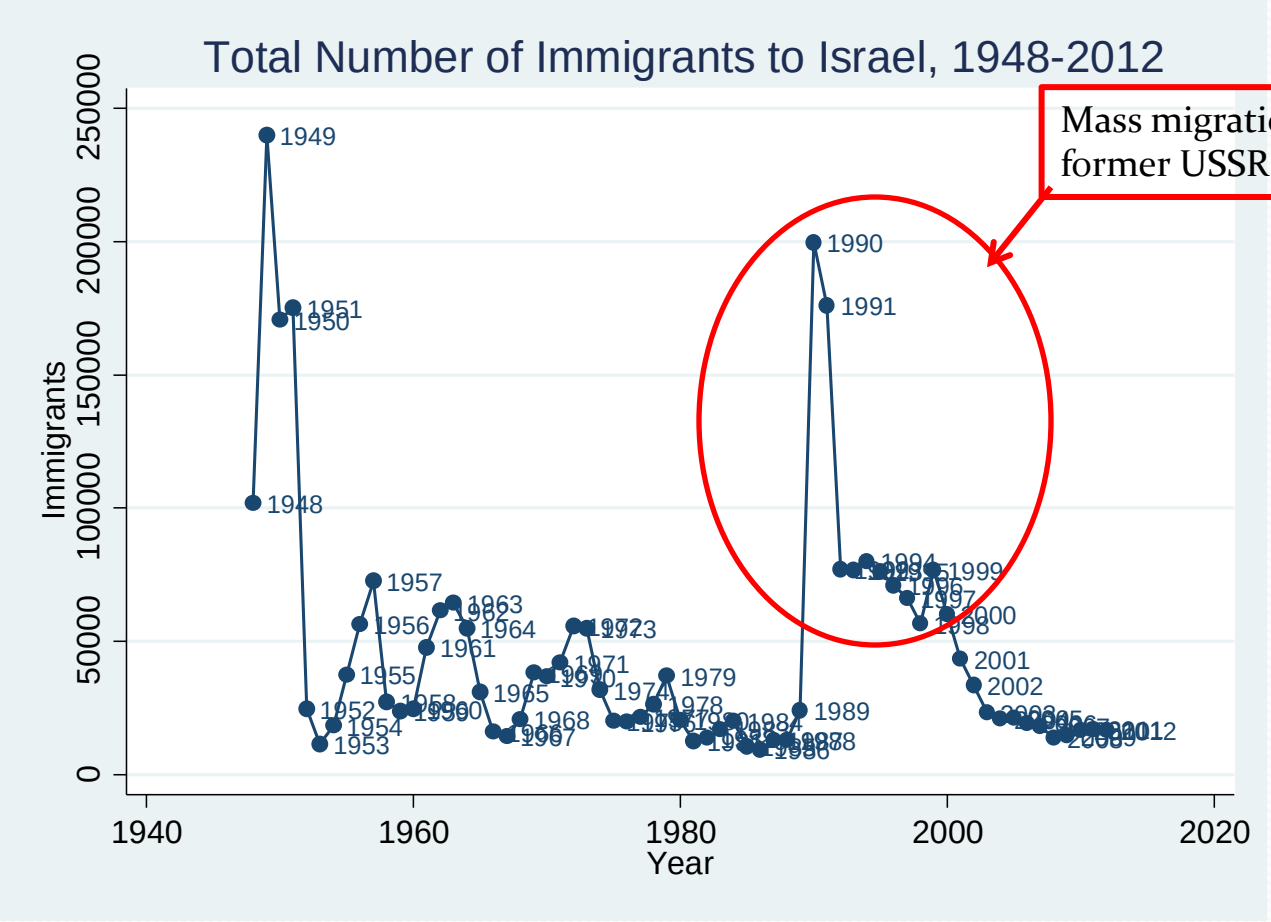
- 2009 NYT bestseller highlights the remarkable success of Israel's high-tech industry and start-up sector.

- More start-ups and a larger venture capital industry per capita than any other country in the world.

- According to authors, immigration is one the two major factors that contribute most to Israel's economic growth:

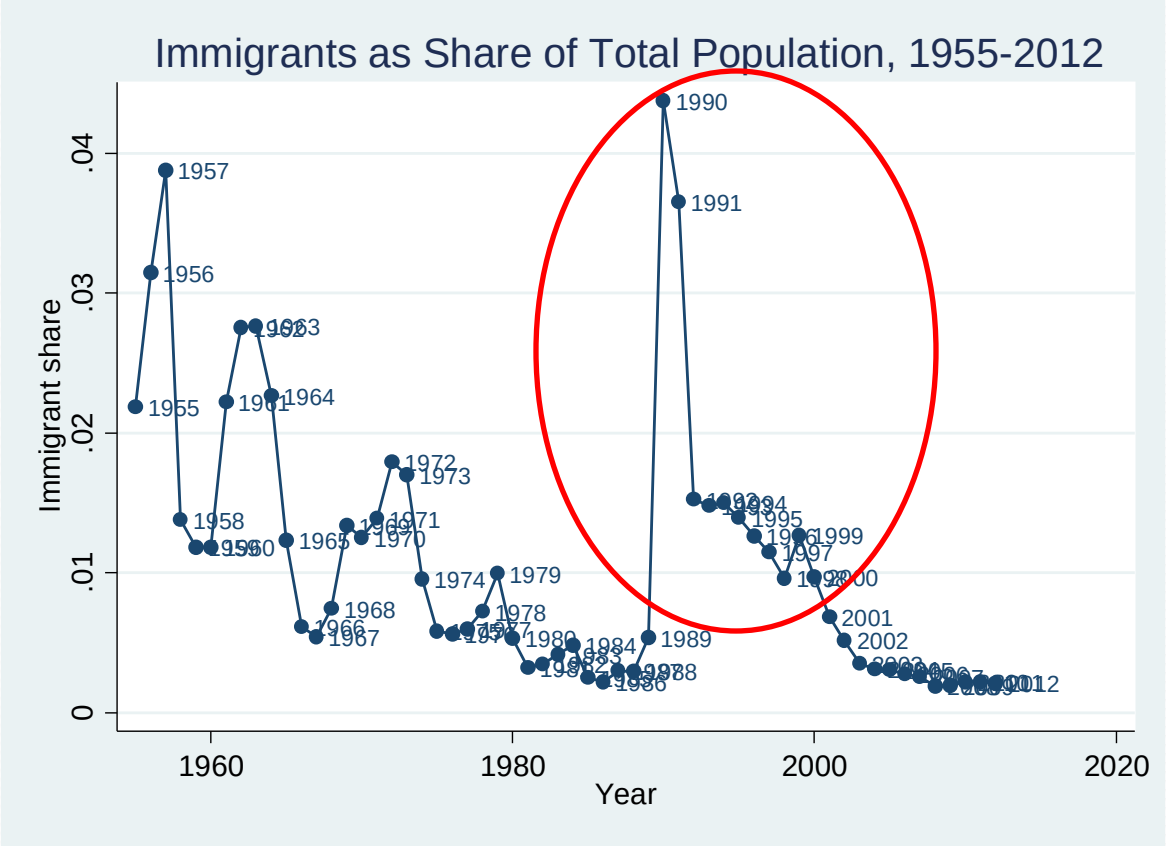
> "Immigrants are not averse to starting from scratch. They are by definition risk-takers. **A nation of immigrants is a nation of entrepreneurs.** [Immigrants] have great incentive to try their luck, to take risks because immigrants have nothing to lose."

Immigration to Israel



Immigration levels quite large both in absolute levels…

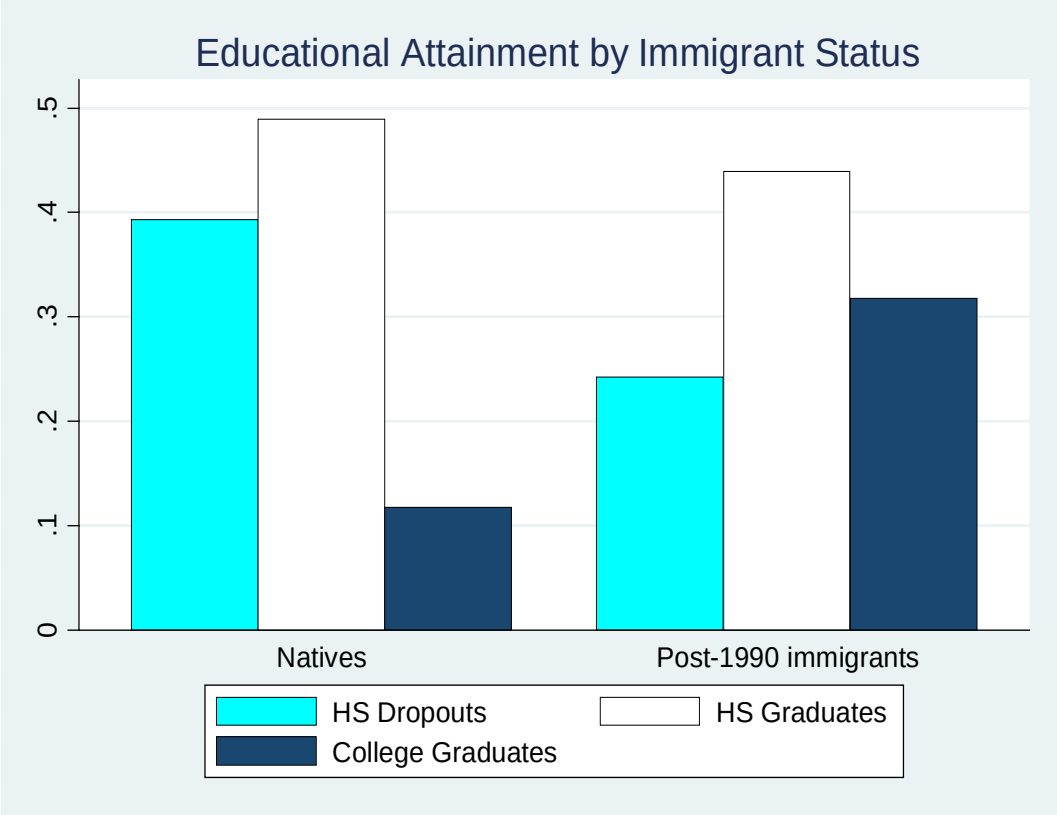
Immigration to Israel



...and as a share of the population.

- 1990s migration wave was unique in terms of size: population increased by 20% between 1989 and 2000 …

- … and in terms of quality:



- Since 1990, Israel's GDP has grown at an average of 4.6% per year (US: 2%).

- What was the role of immigrants in this?

Roadmap

- Introduction
- Immigration policy in Israel
- Focus on 1990s mass migration episode:
  - How were immigrants absorbed in Israeli economy?
  - Effects on the labor market.
  - The effects of immigrants on productivity in manufacturing.

Immigration Policy

- Israel's Declaration of Independence: "The Jewish State will be open for Jewish Immigration."
- Under the Law of Return, any Jew who wishes to settle in Israel has the right to do so and gains citizenship immediately.
- Immigrants receive a generous package of subsidies.

The "Absorption Basket"

- Cash allowance for 6 months (about $13,400 for a family of 4).
- Rent subsidy.
- Mortgage subsidy.
- Free intensive Hebrew course.
- Customs benefits for appliances.
- Customs benefits for cars.
- Income tax breaks.
- Exemption from municipal taxes.
- University tuition breaks.
- …and more

- Specific benefits for entrepreneurs…
  - Free business and tax advice.
  - Loan financing with preferential terms.

- … and scientists:
  - Counseling and guidance, identifying job openings
  - Employer subsidies (up to $46,000 over three years)

- Many of the same benefits also apply to returning citizens – encouraging return migration.
  - Marie Curie grants (up to €100,000 for in research funding).

- Even though many of these policies were already in place in the 1990s, not clear whether they had much of a role in attracting USSR migrants.

- First wave : main factor driving migration was uncertainty about security and economic prospects in collapsing USSR.
  - Many would have preferred US or Germany.
  - As 1990s progressed, immigrants became somewhat less skilled.

- After 2000, as security situation in Israel deteriorates, and Russia's prospects improve, migration comes to a halt.

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Immigrants in the Israeli labor market

- Massive influx of high-skill workers, initially struggled to find employment commensurate to their skills.

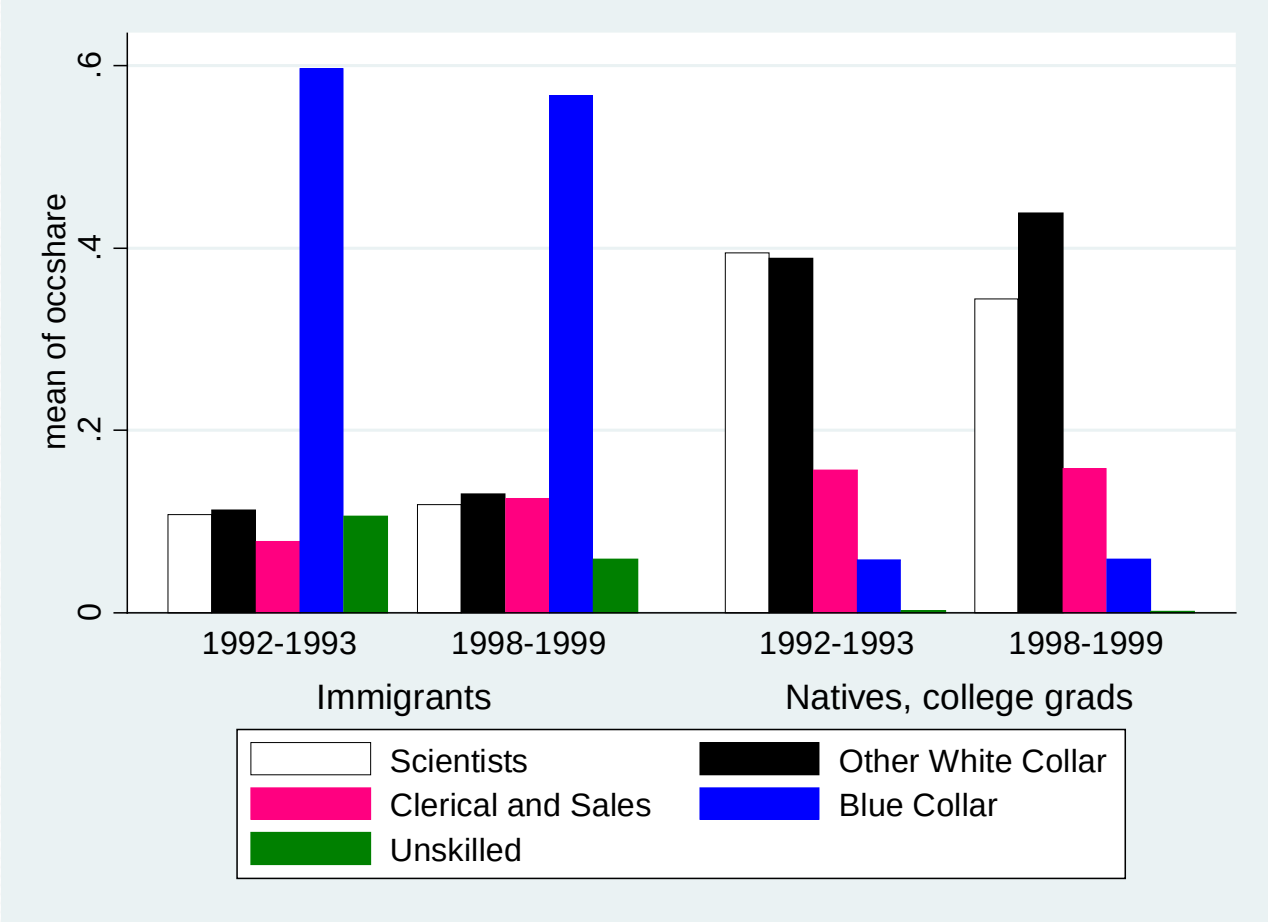
Table 1
Yearly Occupational Distribution in Israel, Males Ages 25–55 on Arrival (%)

	Occupation 1	Occupation 2	Occupation 3	No Job	*N*
Occupation in Israel:					
Year 1	11.6	5.6	56.6	26.2	1,058
Year 2	17.4	6.9	57.7	17.9	929
Year 3	22.3	7.2	57.5	13.0	793
Year 4	27.6	7.5	52.7	12.2	583
Year 5	36.7	7.8	47.7	7.8	218
Occupation in the former USSR	84.3	4.6	11.0	.0	1,086

NOTE.—USSR = Soviet Union.

Source: Weiss et al. (2003).

- Immigrants' occupational distribution very different from that of native high-skill Israelis.



Labor market effects

- In the short run, relative drop in native wages in occupations with high concentration of immigrants (Friedberg, 2001; Cohen-Goldberg and Paserman, 2011)
  - 10% increase in immigrant share associated with ~3% drop in native wages.
  - Effects dissipates after about 5-10 years.
  - Some debate about whether this should be interpreted as a causal effect.

The Effects of High-Skill Immigration on Productivity (Paserman, 2013)

- Did industries and firms with a higher concentration of immigrants experience productivity gains?

- Focus on manufacturing sector:
  - Detailed data at the firm level, with information on number of immigrants.
  - Also, immigrants disproportionately employed in manufacturing.
  - Israeli growth in the 1990s driven mostly by manufacturing.

- Manufacturing does not include ICT sector.

Figure 1 Israeli output per worker, 1970-2000.

- Fast growth in manufacturing sector in the 1990s.

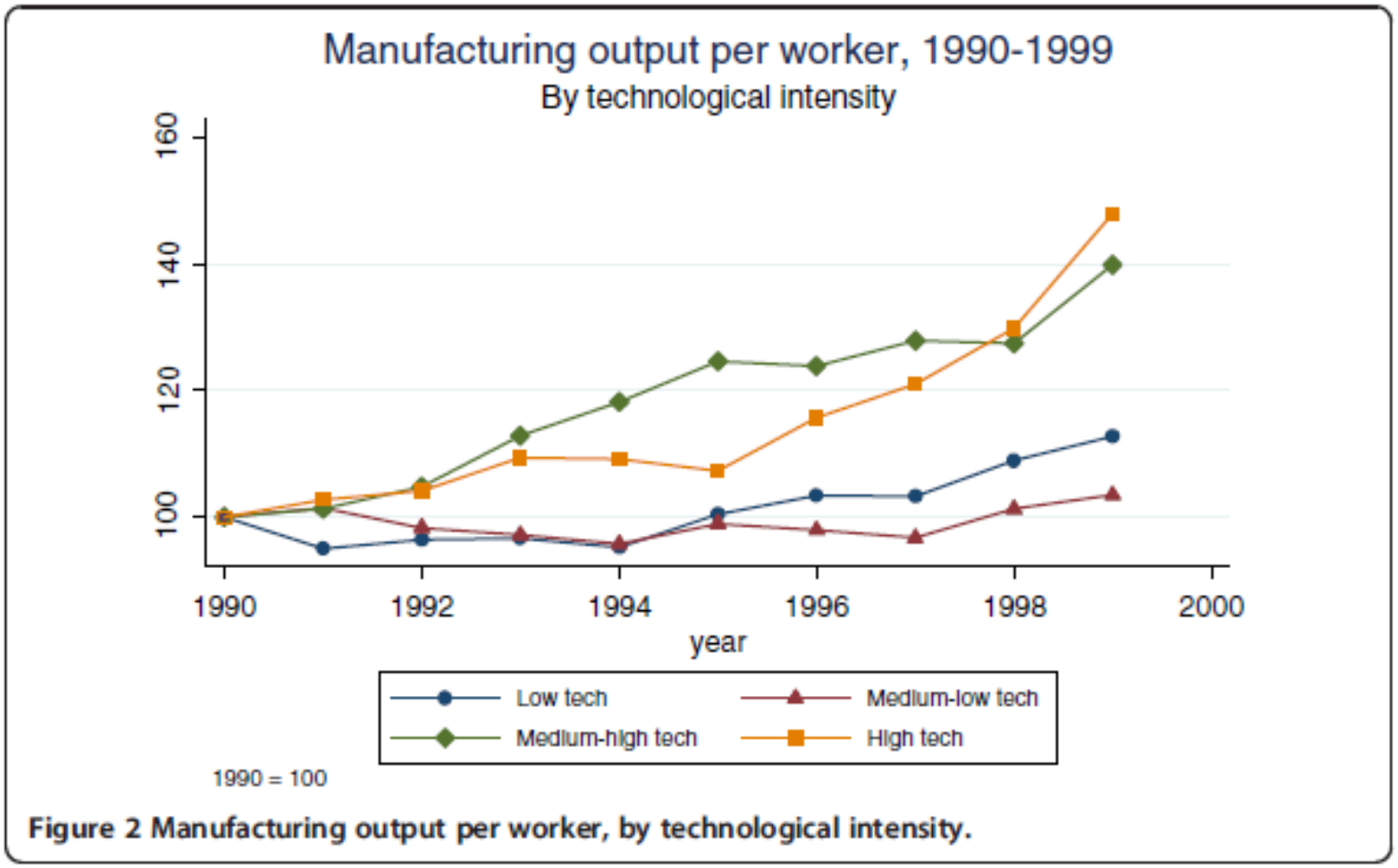


Figure 2 Manufacturing output per worker, by technological intensity.

- Led primarily by high-tech and medium-high tech industries

Table 1 Output per worker and total factor productivity in Israel, 1970-1999

	Average yearly change			
	Output per worker		Total factor productivity	
	Manufacturing	Total private sector	Manufacturing	Total private sector
1970-1979	4.42%	4.58%	2.22%	2.81%
1980-1989	1.67%	1.51%	0.15%	0.91%
1990-1999	3.14%	1.04%	1.63%	0.70%

Source: Author's calculations based on data from the Bank of Israel Annual Report, 2003.

- But is this a causal effect of immigration?
- Growth in manufacturing output per hour in the US:
  - 1990s: 4.7%
  - 1980s: 2.8%

Table 2 Employment distribution of immigrants and natives by industry 1991-1999

	Males		Females	
	Immigrants	Natives	Immigrants	Natives
Agriculture	2.14	3.88	1.83	1.42
Mining and Manufacturing	41.68	25.15	25.53	11.42
Electricity and Water	1.23	1.62	0.27	0.36
Construction	12.39	9.93	0.88	0.97
Commerce, Restaurants and Hotels	10.90	16.00	15.44	12.92
Transport, Storage and Communication	4.35	9.11	1.54	3.33
Financing and Business Services	8.98	11.59	10.79	13.87
Public and Community Services	13.12	17.84	31.41	47.33
Personal and Other Services	5.22	4.88	12.31	8.38
Total	100.00	100.00	100.00	100.0
Percentage Immigrants	9.50		11.21	

Note: Author's calculations from the 1991-1999 Labor Force Surveys.

- Immigrants disproportionately employed in manufacturing.

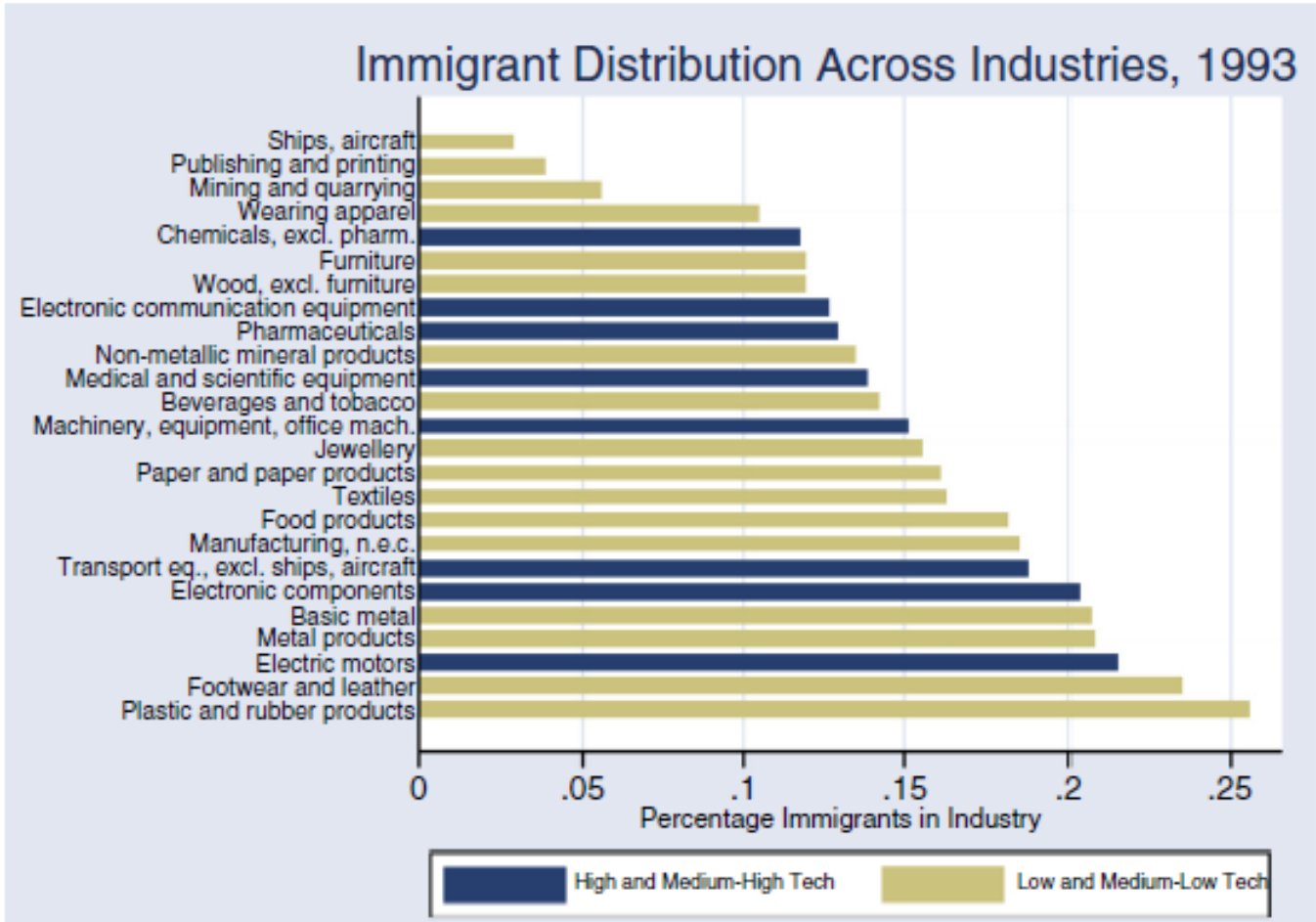


Figure 5 Immigrant Distribution across Industries, 1993.

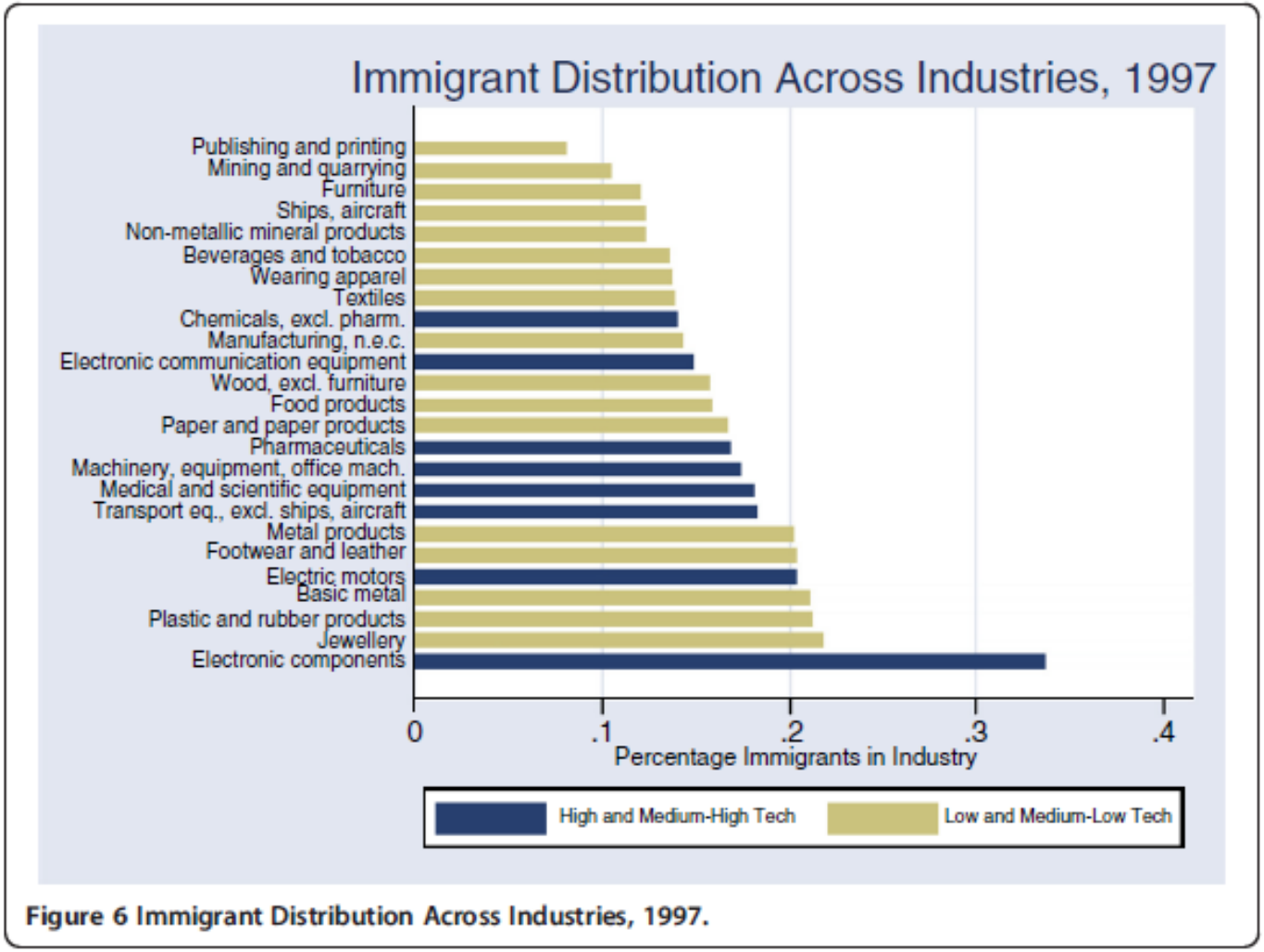


Figure 6 Immigrant Distribution Across Industries, 1997.

- Immigrants employed across manufacturing sector, over time some shift towards high-tech.

Table 6 Occupational distribution of immigrants in manufacturing

	1993			1997		
		Occupational distribution			Occupational distribution	
	Share of occupation who are immigrants	Immigrants	Total	Share of occupation who are immigrants	Immigrants	Total
Scientists	0.074	0.043	0.075	0.159	0.098	0.093
Academics	0.021	0.004	0.026	0.081	0.022	0.042
Technicians	0.028	0.016	0.072	0.111	0.064	0.088
Other production	0.148	0.937	0.827	0.159	0.815	0.777
Total	0.130	1.000	1.000	0.151	1.000	1.000

Source: Author's calculations from the Structure of Labor Force surveys.

- Relatively small proportion employed as scientists, but increases over time.

Is immigrant concentration correlated with productivity at the firm level?

	Dependent variable: Log-output per worker			
	Firms	Firms	3-digit industries	3-digit industries
	Pooled OLS (1993, 1997)	First Difference (90-93, 93-97)	Fixed effects, 1990-1999	IV- FE, 1990-1999
Share of immigrants	**0.022 (0.029)**	**-0.073** (0.030)**	**-0.028 (0.040)**	**0.052 (0.173)**
N	3508	2361	760	760

Regressions also control for log capital and materials per worker, log employment, year dummies, log R&D expenditures (firm-level only) and region dummies (firm-level only).

- No evidence that immigrant concentration is correlated with productivity growth at either the firm or the industry level.
  - If anything, a negative correlation.
- Results robust to different ways of measuring productivity.
- Must be cautious about making causal statements, even though no evidence that immigrants were systematically sorted into low-growth firms.

Heterogeneous effects

	Firm- level analysis, First Differences, 1990-1993 and 1993-1997	
	Share Immigrant Scientists	Share immigrants other occupations
All industries	0.014 (0.198)	-0.073** (0.028)
Low-tech industries	-0.977** (0.225)	-0.119** (0.032)
Medium-low	0.185 (0.131)	0.058 (0.063)
Medium-high	0.677 (0.467)	0.131** (0.057)
High-tech	-0.219 (0.460)	0.045 (0.118)

Negative correlation driven by low-tech industries, no evidence that immigrant scientists boost productivity in high-tech (but very imprecise).

Discussion

- Despite suggestive macro trends, no evidence of a positive correlation at the micro level.
  - If anything, correlation was negative, especially in low-tech firms.

- Possible explanations:
  - High-skill immigrants employed in low-skill jobs not necessarily conducive to higher productivity.
  - Cultural and language barriers prevent assimilation.
  - Efficient sorting of workers across industries? (Peri, 2012)

Lessons for other countries?

- Israeli episode unique, maybe not repeatable in other contexts.
  - Supply-driven migration.
  - Immigrants fled USSR in haste, little knowledge of chances to integrate.

- Yet, some lessons may be general:
  - Cultural, language and professional barriers: not all human capital is transferable (Friedberg, 2001).
  - The Borjas-Roy (Borjas, 1987) model of migrant selection: immigrants not necessarily positively selected.

Thank you!

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