



HSE Institute for Statistical Studies and Economics of Knowledge

International Academic Symposium 'Foresight and Science, Technology and Innovation Policy'

The Welcoming Cities: How Urban Openness Shapes Unicorn Founders' Migration

Preliminary Results

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How Talent Migration Boosts Economic Growth, Innovation, and Knowledge Production

- a one percent increase in the share of skilled migrants increases the number of **patents** by **0.08** percent (Bosetti et al., 2015);
- a 0.1%-point increase in the share of Temporary Graduate visa holders in Australia's region leads to a **3.17%** increase in **patent applications** per 10,000 residents in that region (Crown et al., 2020);
- immigrants introduce new and previously non-existent **technological fields** in their destination US regions (Diodato et al., 2022);
- immigrants found approximately a **quarter of new companies** in the US annually (Kerr and Kerr, 2022);
- foreign-born individuals found **40% of Fortune 500 companies** and **65%** of those on **the Forbes AI list** (Kerr, 2020; NFAP, 2023).

Sources: Bosetti, V., Cattaneo, C., and Verdolini, E. (2015). 'Migration of skilled workers and innovation: A European perspective', *Journal of International Economics*, 96: 311–322; Crown, D., Faggian, A., & Corcoran, J. (2020). Foreign-Born graduates and innovation: Evidence from an Australian skilled visa program. *Research Policy*, 49(9), 103945; Diodato, D., Morrison, A., & Petralia, S. (2022). Migration and invention in the age of mass migration. *Journal of Economic Geography*, 22(2), 477-498; Kerr, S. P., and Kerr, W. R. (2022). 3 Immigration Policy Levers for US Innovation and Start- Ups, *Innovation and Public Policy*, Chicago: University of Chicago Press; Kerr, W. R. (2020). *The Gift of Global Talent: Innovation Policy and the Economy*, Cambridge, MA: National Bureau of Economic Research; NFAP (2023). AI and Immigrants, <https://nfap.com/wp-content/uploads/2023/06/AI-AND-IMMIGRANTS.NFAP-Policy-Brief.2023.pdf>



Politicians in many nations view talented immigrants as a resource for expanding the pool of potential entrepreneurs

Some countries and cities have implemented specialized visa programs to attract the talent that fuels entrepreneurial activity, particularly in high-growth potential start-ups:

- *French Tech Visa*¹ – a residency program designed **to attract international tech talent** to live and work in France. The visa is valid for up to 4 years (renewable). For **founders**, it requires an innovative business project validated by a French institution and personal funds of at least €21,622 per year;
- *UK Innovator Founder Visa*² – a residency program for **experienced entrepreneurs** from outside the UK to establish an innovative, viable, and scalable business there. The visa is initially valid for 3 years (renewable). Key requirements include: securing an endorsement from an approved body, meeting the English language requirement at Level B2, and having personal savings of at least £1,270;
- *Shanghai's Pudong District* offers substantial financial incentives to relocated “**Elite Pearl Talents**”, including **tech entrepreneurs**³. Outstanding young overseas entrepreneurs are eligible for a one-time subsidy of 500,000 yuan (approximately \$70,026 USD), annual payments of up to 2 million yuan (\$280,104 USD), and a housing rental subsidy of up to 3,000 yuan (\$420 USD) per month for up to three years.

Sources: ¹ French Tech Visa. <https://lafrenchtech.gouv.fr/en/come-work-in-france/french-tech-visa/>;

² UK Innovator Founder Visa. <https://www.gov.uk/innovator-founder-visa>;

³ PUDONG.GOV.CN (2023) 2023 年浦东新区明珠计划“高峰”人才项目申报指南. <https://www.pudong.gov.cn/mzjh/20230817/765032.html>



A New Priority for Policymakers is Fostering and Attracting Unicorn Companies

Unicorns – companies whose market value has reached \$1 billion within ten years of their establishment, while they remained at least three-quarters owned by the original founders and did not make an initial public offering (IPO).

The critical importance of unicorn companies and the necessity of fostering their growth are widely acknowledged by nations and cities, manifesting in their policy programs:

- the European Union has launched the European Innovation Council (EIC) **Scale Up 100 initiative**, aimed at supporting 100 promising deep-tech startups with the potential to reach a valuation of €1 billion¹;
- the Republic of Korea has been running the **Baby Unicorn 200 Fostering Project**, administered by the Ministry of SMEs and Startups, with the objective of annually identifying and supporting future unicorns²;
- **Beijing** is implementing a **municipal program** that supports deep-tech unicorns, offering a comprehensive approach to their development. This includes assistance with attracting qualified talent, marketing, securing funding, and IPO preparation³.

Sources: ¹ EIC Scaling Club. https://eic.ec.europa.eu/eic-funding-opportunities/business-acceleration-services/eic-scaling-club_en;

² Baby Unicorns Selected by the Ministry of SMEs and Startups Show High Growth Rates. <https://mss.go.kr/site/eng/ex/bbs/View.do?cbldx=244&bclidx=1039531>;

³ Beijing city authorities take steps to support tech unicorns, including fast-tracking IPO approvals. <https://finance.yahoo.com/news/beijing-city-authorities-steps-support-093000329.html>.



Empirical research highlights specific conditions crucial for migrant high-tech entrepreneurs, including market opportunities, venture capital, leading universities, English-speaking environment

Determinants of high-tech migrant entrepreneurship in empirical studies

Author(s)	Data	Level of analysis	Determinants (impact)
Calcagnini et al. (2016)	1,978 Italian innovative start-ups registered in the Special Section of the Business Register	National level	<ul style="list-style-type: none"> • Number of master's program graduates (+) • Population size (+)
Kutsenko et al. (2022)	3,190 founders of 1,320 unicorn companies (as of July 2022, based on Crunchbase data)	International level	<ul style="list-style-type: none"> • Venture investments (+) • Number of leading R&D organisations (+) • Number of leading business schools (+) • Number of highly cited scientists (+) • Number of Nobel Prize and Fields Medal winners (+)
Weik et al. (2024)	11,000 VC-backed start-ups' HQ location histories from 17 countries based on VentureXpert and VentureSource databases	International level	<ul style="list-style-type: none"> • Foreign venture capital (+)
Shi et al. (2024)	1,078 venture-backed start-ups based on VentureXpert data over 20 years	International level	<ul style="list-style-type: none"> • Destination population (+) • Destination start-up density (+) • Existing investor in destination (+) • Origin-Destination investment ties (+)
Mazzoni et al. (2025)	1,660 innovative start-ups in 105 Italian NUTS-3 regions with 2,743 founders based on the Italian Chambers of Commerce database, ORBIS, and LinkedIn	Interregional level	<p>Destination and origin determinants:</p> <ul style="list-style-type: none"> • Entrepreneurial ecosystem index (including measures of institutional quality, firm formation rate, the number of network contracts between firms, index of physical infrastructure, finance (venture capital, project finance, and crowdfunding), number of participants in Program Horizon 2020, percentage of graduates and PhD, intramural expenditure on activities related to R&D, GDP per capita, percentage of firms in knowledge-intensive market services) (+) • GDP per capita (+) • Population density (+) • Driving hours between regions (-) • Number of STEM students per 1000 inhabitants (+) • General interregional migration flows (+)

Sources: Calcagnini, G., Favaretto, I., Giombini, G., Perugini, F., and Rombaldoni, R. (2016). 'The role of universities in the location of innovative start-ups', *The Journal of Technology Transfer*, 41: 670–693; Kutsenko, E., Tyurchev, K., and Ostashchenko, T. (2022). 'Relocation as a driver of innovative activity: a global study of unicorn founders' migration', *Foresight and STI Governance*, 16: 6–23; Weik, S., Achleitner, A. K., and Braun, R. (2024). 'Venture capital and the international relocation of startups', *Research Policy*, 53: 105031; Shi, Y., Sorenson, O., and Waguespack, D. M. (2024). 'The new argonauts: The international migration of venture-backed companies', *Strategic Management Journal*, 45: 1485–1509; Mazzoni, L., Riccaboni, M., and Stam, E. (2025). 'Entrepreneurial ecosystems and interregional flows of entrepreneurial talent', *Small Business Economics*.

Purpose, Key Features, and Conceptual Framework of the Study

The **city-level factors attracting foreign unicorn founders remain understudied**. Despite this **research gap**, the role of international founders is clearly significant: **30.5% of unicorn founders established their businesses outside their countries of origin** (Kutsenko et al., 2022).

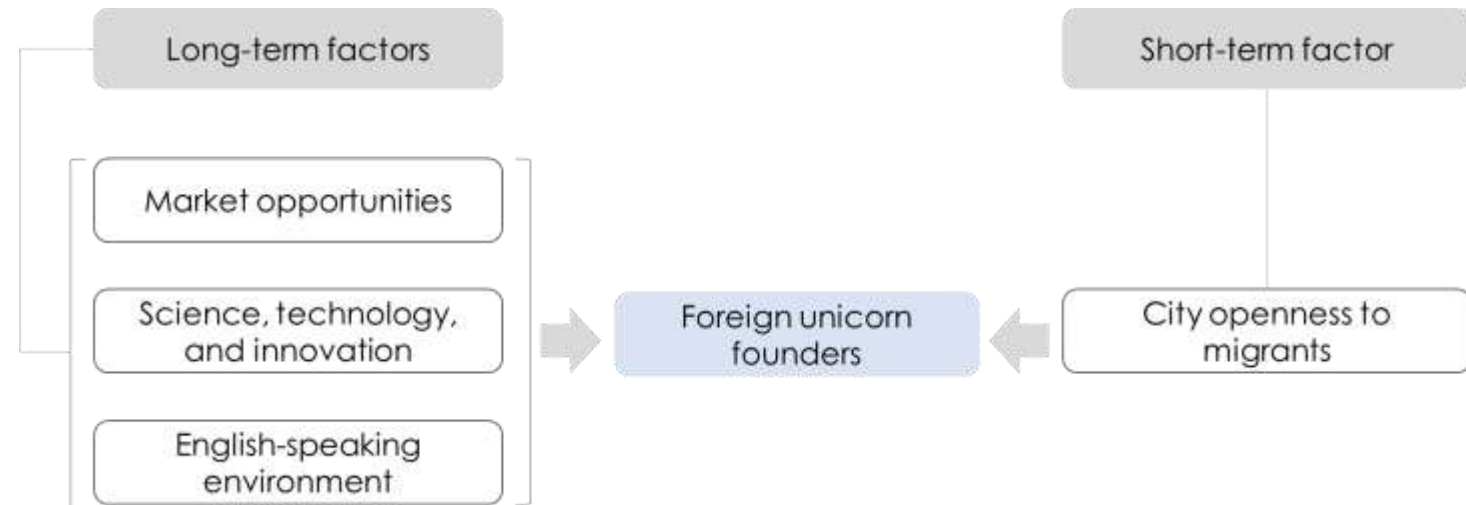
The **purpose** of the study is to examine the relationship between city openness, measured by the concentration of immigrants and foreign students, and the presence of foreign-born unicorn founders.

Hypothesis: Open, immigrant-welcoming cities attract foreign unicorn founders.

Research features:

- the **most complete sample** of unicorn founders as of July 2022 (**3,181** unicorn founders);
- full coverage of the unicorn founders cities of origin and destination;
- a **comprehensive framework of factors** including urban openness, market opportunities, science, technology and innovation, and an English-speaking environment.

Conceptual framework of the study



Source: authors.

Source: Kutsenko, E., Tyurchev, K., and Ostashchenko, T. (2022). 'Relocation as a driver of innovative activity: a global study of unicorn founders' migration', *Foresight and STI Governance*, 16: 6–23.



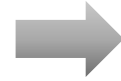
Data and Sources

1

Data on **1,357** unicorns as of July 2022 from Crunchbase



Available founder information for **1,317 unicorns**



A total of **3,181 unicorn founders** were identified using publicly available data, primarily social media profiles (LinkedIn, Facebook, X)



2

A total of 284 unique settlements with at least one unicorn were grouped into **170 agglomerations**. This step acknowledges that innovation ecosystems often span beyond formal city boundaries, forming integrated economic regions. Analyzing agglomerations thus offers a more realistic view of functional urban units and their cross-border labor and entrepreneurial dynamics. Due to data constraints, we used Functional Urban Areas (FUAs) for OECD countries and national definitions for others.

3

31% of founders (**980** individuals) migrated across international borders to establish their business. These foreign-born founders were present in **88 agglomerations** (52% of those with unicorn companies).

Methodology

Variables for assessing urban openness, market opportunities, science, technology, and innovation, and English-speaking environment

Variable	Data source	Period
Independent variables		
<i>Openness</i>		
Share of immigrants in the total population (%)	Columbian College of Arts & Sciences	2015 or the last available period
Share of foreign students in the total number of students (%)	QS, THE, ARWU	2023
Control variables		
<i>Market opportunities</i>		
Population (pers.)	Passport Euromonitor	2021
GDP (million USD)	Passport Euromonitor	2021
<i>Science, technology, and innovation</i>		
Venture capital investment (million USD)	Crunchbase	2019–2023
Number of leading universities	QS, THE, ARWU	2023
Number of leading R&D organizations	SCImago	2023
Number of native unicorn founders in the city (pers.)	Crunchbase	2022
<i>English-speaking environment</i>		
Number of international schools (per 100,000 population)	International Baccalaureate Organization	2023
English Proficiency Index	Education First	2023
Number of international business events (per 100,000 people)	International Congress and Convention Association	2023

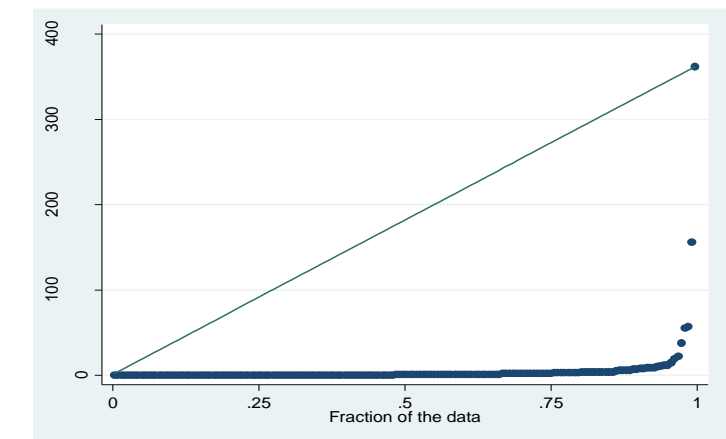
Source: authors.

Dependent variable: Total number of foreign unicorn founders in the city do not follow the nice normal curve and are skewed (Fig. 1, Fig. 2.). For this reason, **quantile regression** is used to estimate the conditional median of the target variable.

Fig. 1. Density distribution of the number of foreign unicorn founders across cities



Fig. 2. Quantile distribution of the number of foreign unicorn founders across cities



Source: Authors' estimation.

Quantile Groups and Descriptive Analysis

66th quantile

USA: Utah, Detroit, Salt Lake City, Jackson, Nashville, Jefferson, Fayette, Orange, Jacksonville, Dane, Bend, Hanover, Columbus, Pittsburgh, Ada, Whatcom, Zephyr Cove, New Haven, Charleston, El Paso, Douglas, Carson City, South Burlington, Denver, Phoenix, Wake;
China: Beijing, Guangzhou, Suzhou, Chengdu, Chongqing, Jiangmen, Changsha, Zhengzhou, Xuchang, Wuhu, Wuhan, Qingdao, Fuzhou, Ningbo, Shenzhen;
UK: Bristol, Oxford, West Midlands, Aberdeen, Leicester, Guildford, Winchester;
India: Delhi, Mumbai, Pune, Chennai, Hyderabad, Vapi;
Germany: Karlsruhe, Hamburg, Chemnitz; **Denmark:** Copenhagen, Aarhus; **Norway:** Oslo, Vatne; **Israel:** Jerusalem, Haifa; **Brazil:** Curitiba, Campinas; **Belgium:** Brussels; **Czech Republic:** Prague; **Finland:** Oulu;
Greece: Athens; **Ireland:** Kilkenny; **Estonia:** Tallinn; **France:** Lille; **Iceland:** Reykjavik; **Lithuania:** Vilnius;
Portugal: Coimbra; **Croatia:** Zagreb; **Canada:** Ottawa; **Argentina:** Buenos Aires; **South Korea:** Seoul;
Japan: Yamagata; **Australia:** Sydney; **Taiwan:** Taoyuan-Zhongli; **Viet Nam:** Hanoi; **Chile:** Santiago;
Philippines: Manila; **Saudi Arabia:** Riyadh.

75th quantile (66th quantile + 15 extra)

USA: Tampa, Washoe, Las Vegas, Minneapolis, Ventura, Santa Barbara, Boulder, Quincy;
UK: Manchester, Cambridge, Peterborough, Hamilton (Bermuda), Road Town;
Germany: Göttingen, Frankfurt am Main; **Spain:** Madrid, Barcelona; **Ireland:** Galway, Dublin; **China:** Hangzhou, Nanjing; **Austria:** Vienna; **Belgium:** Ghent; **Finland:** Helsinki; **Italy:** Milan; **Sweden:** Stockholm;
Switzerland: Lausanne; **Israel:** Netanya; **Turkey:** Istanbul; **Australia:** Brisbane; **Canada:** Guelph;
Malaysia: Kuala Lumpur; **Thailand:** Bangkok; **Viet Nam:** Ho Chi Minh City; **UAE:** Abu Dhabi; **Azerbaijan:** Baku; **Bahamas:** Nassau; **Colombia:** Bogotá; **Mexico:** Monterrey; **Republic of Seychelles:** Victoria;
Senegal: Dakar; **Nigeria:** Lagos.

100th quantile (66th quantile + 42 extra)

USA: San Francisco, New York, Boston, Los Angeles, Chicago, Seattle, Miami, Washington, D.C., Austin, Portland, Dallas, Philadelphia, Charlotte, San Diego, Houston, Atlanta;
Canada: Toronto, Montreal, Kitchener, Vancouver;
Switzerland: Zürich, Schaffhausen, Geneva; **Germany:** Berlin, Munich; **China:** Hong Kong, Shanghai;
France: Paris; **UK:** London; **Luxembourg:** Luxembourg; **Malta:** Valletta; **Netherlands:** Amsterdam; **Israel:** Tel Aviv;
Australia: Melbourne; **UAE:** Dubai; **Singapore:** Singapore; **Japan:** Tokyo; **India:** Bengaluru; **Indonesia:** Jakarta;
Mexico: Mexico City; **Brazil:** São Paulo; **Ecuador:** Quito.

- Approximately **56%** of all cities hosting at least one unicorn company are concentrated in just **five** economies: **the US** (50 cities), **China** (19), **the UK** (13), **India** (7), and **Germany** (7);
- Founder distribution exhibits systematic unevenness: **the US** cities account for **47.1%** of all native-born unicorn founders and dominate with **69.9%** of foreign-born founders;
- **China** presents an inverse pattern, contributing **16.0%** of native founders but only **1.4%** of foreign founders;
- **the UK** demonstrates relatively balanced proportions (**3.1%** native vs **6.4%** foreign);
- **India** and **Germany** show limited international founder attraction (**9.0%/0.4%** and **3.4%/2.8%** respectively) relative to their native outputs.

Descriptive Analysis Across Quantile Groups

Average values of variables across quantile groups

Variable	66 th quantile	75 th quantile	Cities with ≥ 1 unicorn company (100 th quantile)
	113 cities	128 cities	170 cities
Total number of foreign unicorn founders in the city (pers.)	0.3	0.5	5.8
Openness			
Share of immigrants in the total population (%)	10.7	11.2	14.0
Share of foreign students in the total number of students (%)	8.9	9.2	11.4
Market opportunities			
Population (pers.)	5,054,850	4,846,759	5,510,319
GDP (million USD)	135,128	138,048	223,670
Science, technology, and innovation			
Venture capital investment (million USD)	4,089	4,172	9,941
Number of leading universities	3.4	3.5	4.4
Number of leading R&D organizations	2.4	2.7	3.4
Number of native unicorn founders in the city (pers.)	5.7	5.8	12.9
English-speaking environment			
Number of international schools (per 100,000 population)	0.3	0.3	0.4
English Proficiency Index	660	662	670
Number of international business events (per 100,000 people)	0.9	1.0	0.9

– the maximum
 – the minimum

Source: Authors' estimation.

- On average, cities in the **full sample** host **six** foreign founders. The leading hubs include San Francisco (362 foreign founders), New York (156), London (57), Singapore (55), Boston (38), Los Angeles (22), Berlin (19), Chicago (15), Seattle (12), and São Paulo (12). These cities combine substantial **immigrant (14% average share)** and **foreign student (11.4%) populations** with strong economic fundamentals, presence of leading universities, and globally oriented infrastructure, while maintaining sizable communities of native-born unicorn founders;
- The **75th quantile group** includes cities such as Road Town, Quincy, Dublin, Madrid, Stockholm, Lausanne, Nanjing, Hangzhou, and Brisbane, each hosting two foreign-born founders, among others. These cities exhibit higher openness levels than the 66th quantile, with **immigrants** and **foreign students** shares of **11.2%** and **9.2%**, respectively;
- Cities at the **66th quantile** show the lowest average number of foreign-born unicorn founders among the studied groups – **0.3** founders per agglomeration. This category is represented by hubs such as Beijing, Brussels, Prague, Delhi, Seoul, Sydney, and Oslo. These cities exhibit a moderate level of urban openness, characterized by an immigrant share of **10.7%** and a foreign student representation of **8.9%**. The average number of native-born founders in this group is comparable to that of the 75th quantile.

Number of foreign unicorn founders in the city: 100th quantile

		Dependent variable					
Group	VARIABLES	Number of foreign unicorn founders in the city					
		Model 12	Model 13	Model 14	Model 15	Model 16	Model 17
Share of immigrants in the total population		0.0148	0.0793***				
		(0.0602)	(0.0143)				
Share of foreign students in the total number of students		0.000143		0.0593***			
		(0.0768)		(0.0199)			
Control variables							
Market opportunities	Population	-4.98e-08			-2.01e-07		-6.65e-08
		(1.51e-07)			(1.98e-07)		(8.91e-08)
	GDP	-9.59e-07			-2.32e-06		1.20e-05***
		(4.25e-06)			(5.95e-06)		(2.10e-06)
Science, technology, and innovation	Venture capital investment				0.00074***		
					(3.17e-05)		
	Number of leading universities	0.00164			0.104	0.0907**	
		(0.179)			(0.257)	(0.0407)	
	Number of leading R&D organizations	-0.330***			-0.226**		
		(0.0628)			(0.0922)		
	Number of native unicorn founders in the city	0.461***					
		(0.00928)					
English-speaking environment	Number of international schools per 100,000 population	0.166		0.646*			
		(1.129)		(0.371)			
	English Proficiency Index	-0.00355		0.00	-0.00326	0.00283	0.000463
		(0.00697)		(0.00171)	(0.00963)	(0.00183)	(0.00431)
	Number of international business events per 100,000 people	0.128	-0.0444	0.00967			
		(0.415)	(0.0748)	(0.141)			
	Constant	1.552	-0.00476	-0.00	2.112	-1.357	-0.566
		(5.039)	(0.280)	(1.120)	(6.908)	(1.311)	(3.084)
	Observations	129	161	162	130	162	130

The results show that city openness, measured by the share of immigrants in the total population and the share of foreign students in the total number of students, has a positive and statistically significant effect on the number of foreign unicorn founders in the city for all quantiles regression results.

Summary of hypothesis testing results

Variable	Main model (Quantile regression)	Robustness check (Negative Binomial Regression, Logit regression model)	Hypothesis supported
<i>Openness</i>			
Share of immigrants in the total population	+	+	Yes
Share of foreign students in the total number of students	+	+	Yes
Control variables			
<i>Market opportunities</i>			
Population	Insignificant	Insignificant	No
GDP	+	+	Yes
<i>Science, technology, and innovation</i>			
Venture capital investment	+	+	Yes
Number of leading universities	+	+	Yes
Number of leading R&D organizations	-	-	No
Number of native unicorn founders in the city	+	+	Yes
<i>English-speaking environment</i>			
Number of international schools per 100,000 population	+	+	Yes
English Proficiency Index	Insignificant	+	No
Number of international business events per 100,000 people	Insignificant	Insignificant	No

Source: Authors' estimation.

This study provides **the first empirical analysis of city-level openness as a determinant for attracting foreign-born unicorn founders on a global scale**, bridging a gap in prior research focused on general national-level factors (Bock and Hackober, 2020; Cristofaro et al., 2024).

The results support the hypothesis that **open, immigrant-welcoming cities attract more foreign unicorn founders**. The analysis demonstrates that openness operates in synergy with other **long-term, historically determined factors**. It is revealed that **wealth, reflected in higher GDP**, is a more crucial market characteristic for attracting foreign unicorn founders than population size, as it signals greater potential for returns and scaling. A **strong science, technology, and innovation** base also shows a significant positive influence. Conversely, the **number of leading R&D organizations has a negative effect**, suggesting that not all forms of high-quality science stimulate entrepreneurial activity equally. Finally, the impact of the **English-speaking environment** proved **statistically insignificant**, contradicting earlier findings (Borjas, 1987; Sui et al., 2015).

Sources: Bock, C., and Hackober, C. (2020). 'Unicorns – what drives multibillion-dollar valuations?', *Business Research*, 13: 949–984; Cristofaro, M., Abatecola, G., Giannetti, F., and Zannoni, A. (2024). 'The survival of the fastest: Unveiling the determinants of Unicorns and Gazelles' early success', *Scandinavian Journal of Management*, 40: 101335; Borjas, G. J. (1987). 'Self-selection and the earnings of immigrants', *American Economic Review*, 77: 531–553; Sui, S., Morgan, H. M., and Baum, M. (2015). 'Internationalization of immigrant-owned SMEs: The role of language', *Journal of World Business*, 50: 804–814.



Conclusion

- 1) This study examines the location decisions of 980 foreign unicorn founders using quantile regression models to investigate the influence of city-level factors. Our findings indicate that urban openness, measured by the concentration of immigrants and foreign students, has a positive and statistically significant effect on the number of foreign unicorn founders.
- 2) Remarkably, major economic powerhouses like Beijing (ranked third globally in its number of native-born founders) and Seoul (ranked 21st) hosted no foreign-born unicorn founders despite their scale. This underscores that factors such as immigration policy, cultural openness, and integration into global networks are critical differentiators. A truly open ecosystem requires not only a migrant population but also a welcoming and inclusive environment that facilitates their participation in high-growth entrepreneurship.
- 3) The research contributes to the ongoing migration policy debate, which must balance universal access with selective programs for specific skills while managing potential strains on local labor and housing markets. Crucially, these concerns are mitigated in the tech sector, where unicorn founders function as net job creators.
- 4) The findings suggest that cities should prioritize developing welcoming and supportive immigration policies to attract international tech talent and high-growth startups. Key recommendations include:
 - simplifying visa procedures for talented individuals and their families, with clear pathways to permanent residency;
 - implementing lenient immigration rules for students and skilled entrepreneurs;
 - actively fostering and supporting entrepreneurial activity among immigrants to leverage their potential for driving innovation and economic growth.
- 5) The analysis also highlights the role of international schools as a factor for founders relocating with families, who prioritize access to education in a globally recognized language.



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