



The creation and evolution of entrepreneurial public markets

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- Much of his research focuses on financial issues related to start-ups, and high growth firms, and the interaction of these issues with innovation and entrepreneurial activity.
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- Bernstein, Shai Benjamin, Emanuele Colonnelli, Davide Malacrino, and Timothy McQuade. ["Who Creates New Firms When Local Opportunities Arise?" \(pdf\)](#) Journal of Financial Economics (forthcoming).
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- **Josh Lerner** is the Jacob H. Schiff Professor of Investment Banking at Harvard Business School. He graduated from Yale College with a special divisional major that combined physics with the history of technology. He worked for several years on issues concerning **technological innovation and public policy** at the Brookings Institution, for a public-private task force in Chicago, and on Capitol Hill. He then earned a Ph.D. from Harvard's Economics Department.

- Lerner, Josh, Jason Mao, Antoinette Schoar, and Nan R. Zhang. "Investing Outside the Box: Evidence from Alternative Vehicles in Private Equity." (pdf) Journal of Financial Economics (forthcoming).
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- Lerner, Josh, Amit Seru, Nick Short, and Yuan Sun. ["Financial Innovation in the 21st Century: Evidence from U.S. Patents."](#) (pdf) Harvard Business School Working Paper, No. 21-136, June 2021.



- Abhishek Dev is a Ph.D. candidate in Finance at the Yale School of Management.
- Abhishek's research focuses on entrepreneurial finance and impact investing.



Abstract

This paper explores the creation and evolution of new stock exchanges around the world geared toward entrepreneurial companies, known as second-tier exchanges. Using hand- collected novel data, we show

- (1) the proliferation of these exchanges in many countries, their significant volume of Initial Public Offerings (IPOs), and lower listing requirements.
- (2) Shareholder protection strongly predicted exchange success, even in countries with high levels of venture capital activity, patenting, and financial market development.
- (3) Better shareholder protection allowed younger, less-profitable, but faster-growing, companies to raise more capital.

These results highlight the importance of institutions in enabling the provision of entrepreneurial capital to young companies.



Background

□ How does finance contribute to economic growth?

one important channel: funding of innovative and entrepreneurial projects, allowing young and fast-growing companies to fund research and development (R&D) activities.

Recognizing the importance of entrepreneurial finance, a major focus of financial policy makers around the world has been the creation of new stock exchanges for young and small-capitalization companies, often characterized by less-restrictive listing requirements. (Nasdaq、Shenzhen-based ChiNext)

□ there have been very few systematic empirical explorations of the determinants of the creation and evolution of new exchanges geared toward entrepreneurial firms.

Conceptual framework

- ◆ Stock exchanges provide a **certification and monitoring function** to ensure investors that the issuing company is of high quality and to mitigate concerns about the expropriation of shareholders through, for example, insider trading, price manipulation, or tunneling assets.
- ◆ A reduced risk of expropriation **enhances the willingness of investors to provide capital** to listed firms and to assign higher valuations.

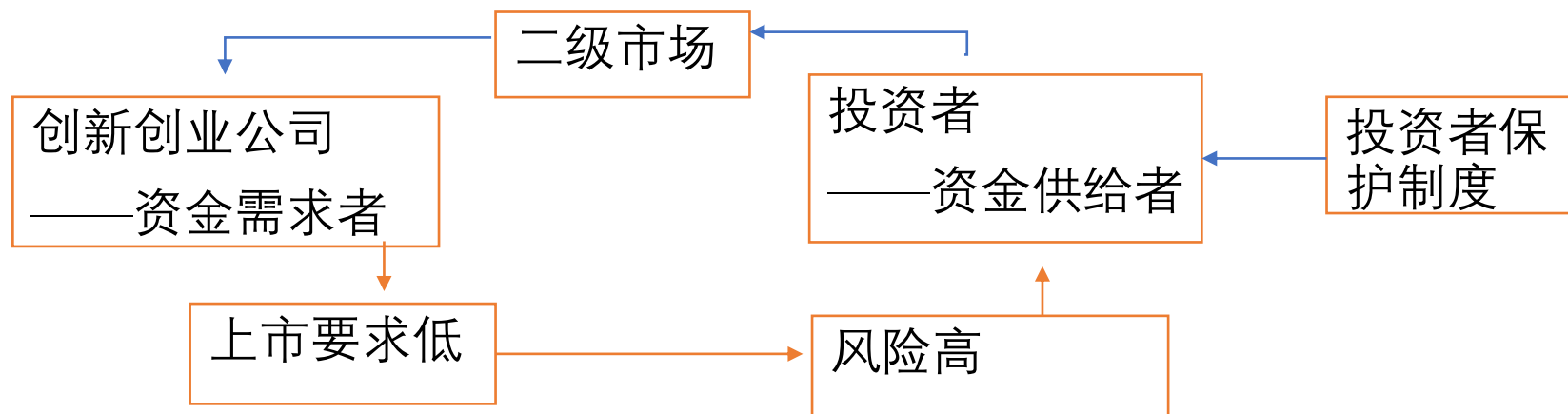


- ▮ higher listing requirements can **reduce information problems** regarding firms and their management
- ▮ high listing requirements can be **problematic for entrepreneurial firms.**

second-tier exchanges

we explore the role of country-level **legal institutions** that are meant to **protect shareholders** from the misuse of corporate assets, provide governance safeguards, and enhance corporate transparency.

Hypothesis



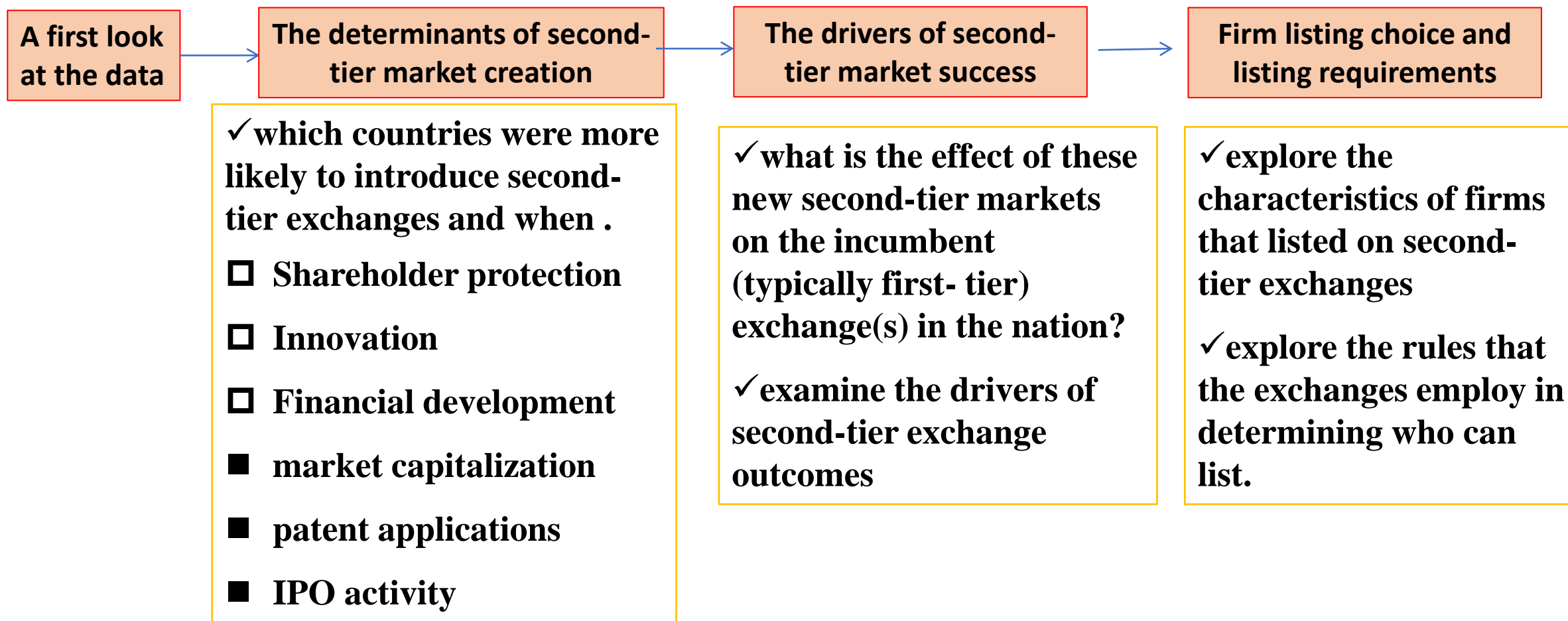
Hypothesis 1 . Countries with **stronger shareholder protection** are **more likely to introduce second-tier markets**, especially if they do not have such markets already.

Hypothesis 2 . Conditional on the introduction of a second- tier market, countries with **stronger shareholder protection will attract more listed companies**, and **more capital will be raised**.

Hypothesis 3 . Second-tier exchanges in countries with stronger shareholder protection will **attract riskier companies**(as lower profitability, younger age, and higher growth) **that will raise more capital**. (In other words, second-tier exchanges will allow more entrepreneurial companies to raise capital)

Hypothesis 4 . The introduction of second-tier exchanges **does not affect the flow and composition of IPOs in existing first-tier stock exchanges** within the same country.

Research Framework





Sample

□ Exchange-level data:

- we focus on stock exchanges introduced between 1990 and 2013 . a final sample of 146 unique new exchanges in 115 countries。
- 69 first-tier and 77 second-tier (targeting entrepreneurial high-growth companies.)

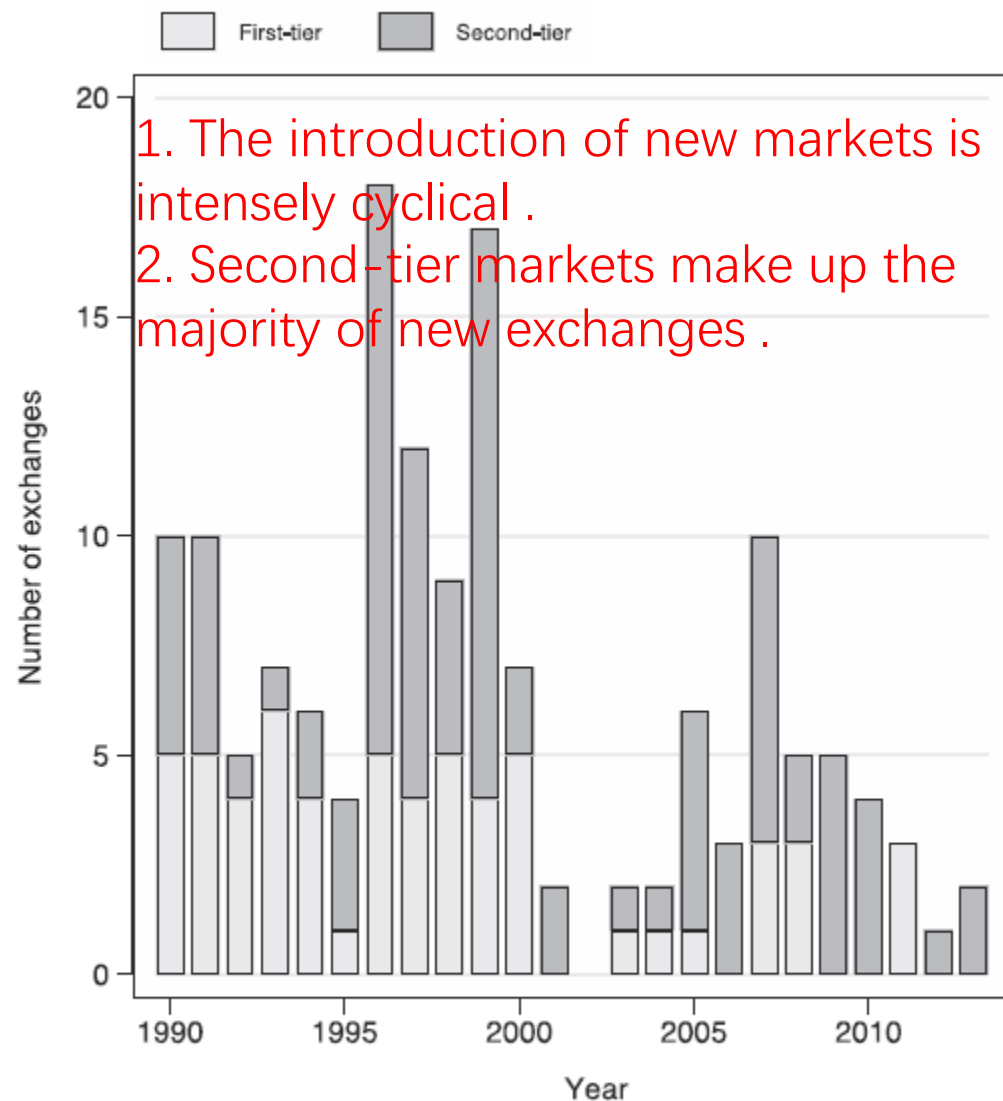
□ IPO sample

- a grand total of 40,090 IPOs across 210 exchanges issued from 1990 to 2017, including those on exchanges established both before and after 1990.

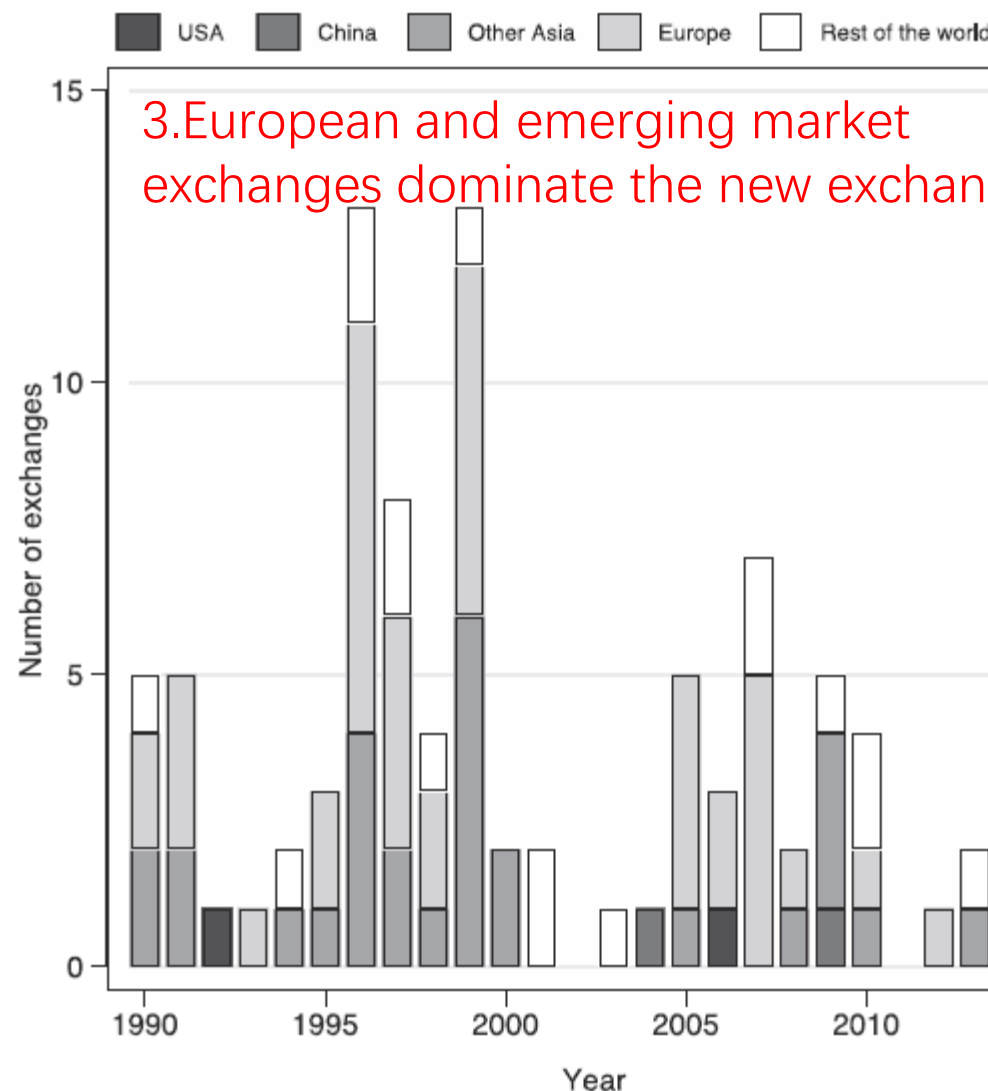
□ Country-level data

- **investor protection:** using the 2017 edition of the World Bank's Doing Business – Protecting Minority Investors database.
- **countries' financial development:** World Bank's Financial Sector Database
- **number of patent applications:** World Intellectual Property Organization's (WIPO) Intellectual Property (IP) Statistics database

A first look at the data

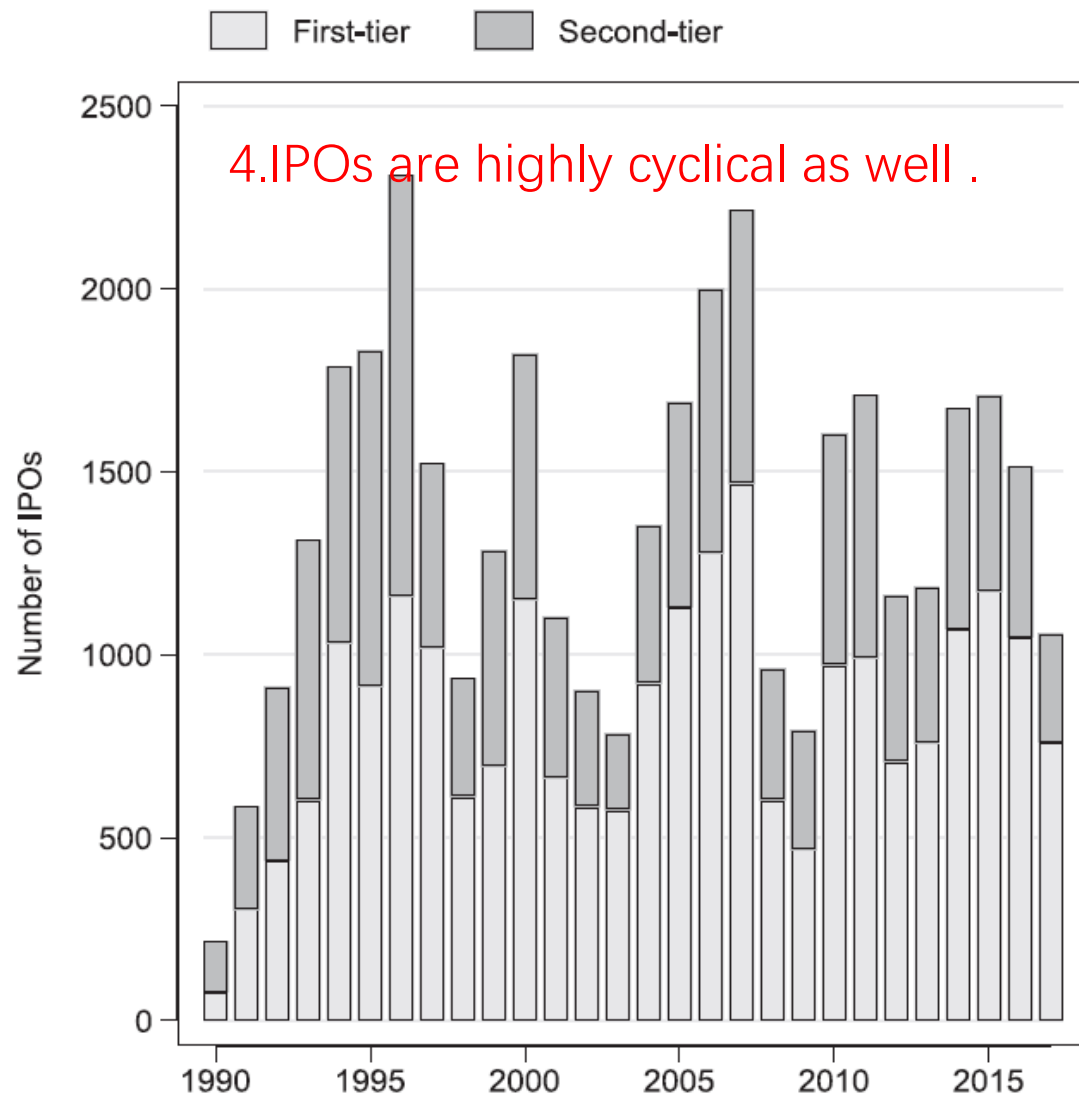


A. Number of new exchanges

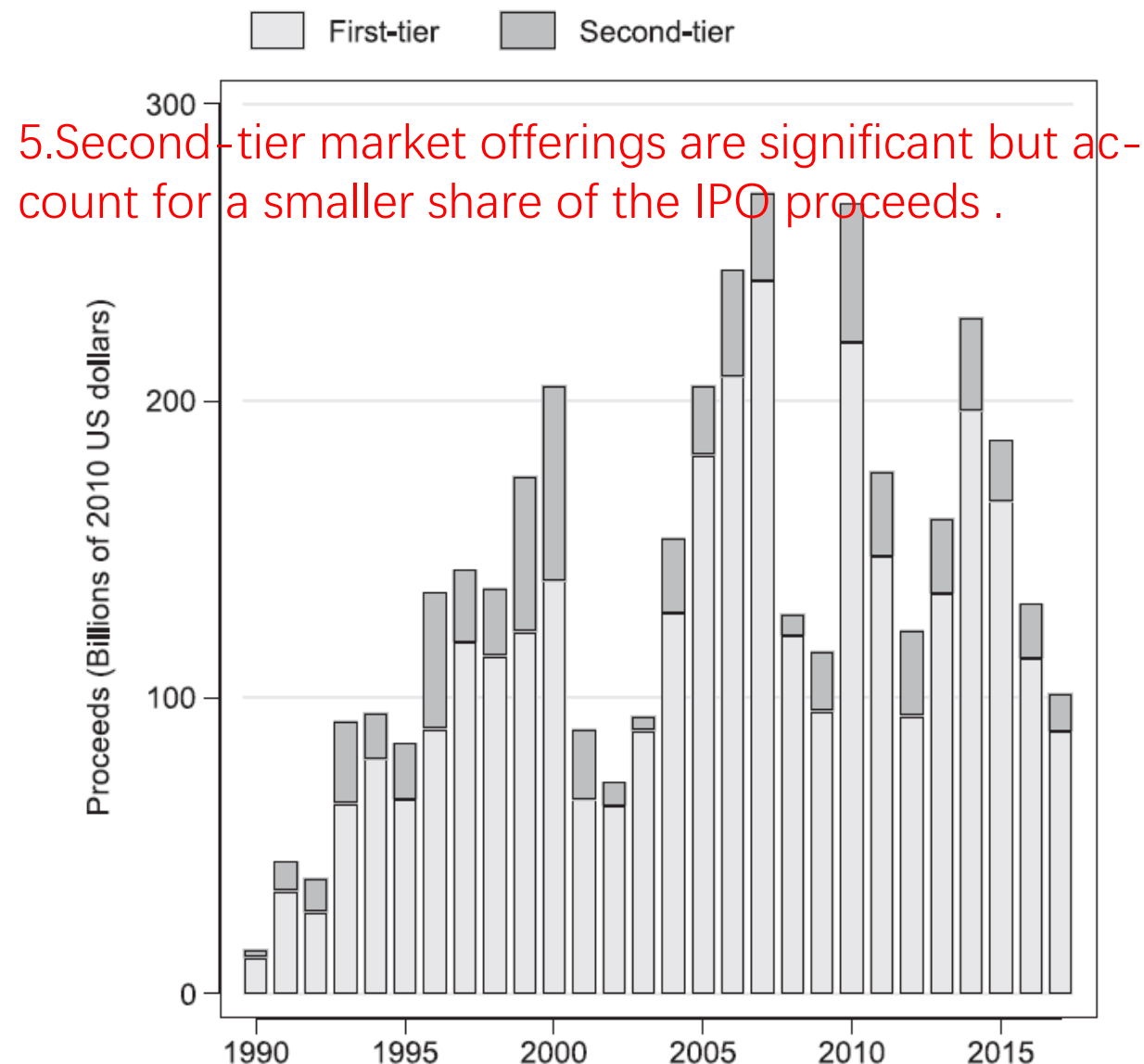


B. New second-tier exchanges by region

A first look at the data



A. Number of IPOs



B. Total proceeds

The determinants of second-tier market creation



Shareholder protection and introduction of new second-tier exchanges.

| | (1) Second-tier | (2) Second-tier |
|--|---------------------|---------------------|
| High shareholder protection (top quartile) | 0.299*** (0.100) | 0.250*** (0.092) |
| Pre-1990 second-tier exchange | 0.138 (0.126) | 0.009 (0.109) |
| ln(GDP) | | -0.033 (0.045) |
| ln(Population) | | 0.116*** (0.038) |
| Region FE | No | No |
| Income group FE | No | No |
| Observations | 115 | 115 |
| R-squared | 0.089 | 0.184 |

The determinants of second-tier market creation



Innovation(patenting and venture capital activity) and introduction of new second-tier exchanges

explore how **economic activity** in the nation affected the likelihood of the introduction of new second- tier markets.

| | (1) Second-tier | (2) Second-tier | (3) Second-tier | (4) Second-tier | (5) Second-tier | (6) Second-tier |
|-------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| High patents (top quartile) | 0.506*** (0.097) | 0.408*** (0.121) | 0.400*** (0.135) | | | |
| High venture capital (top quartile) | | | | 0.546*** (0.092) | 0.461*** (0.113) | 0.418*** (0.132) |
| Pre-1990 second-tier exchange | -0.014 (0.107) | -0.062 (0.110) | -0.038 (0.117) | 0.011 (0.093) | -0.026 (0.095) | -0.036 (0.108) |
| ln(Population) | | -0.043 (0.044) | -0.028 (0.065) | | -0.010 (0.046) | 0.013 (0.065) |
| ln(GDP) | | 0.077* (0.041) | 0.073 (0.054) | | 0.052 (0.042) | 0.048 (0.056) |
| Region FE | No | No | Yes | No | No | Yes |
| Income group FE | No | No | Yes | No | No | Yes |
| Observations | 115 | 115 | 115 | 115 | 115 | 115 |
| R-squared | 0.196 | 0.221 | 0.282 | 0.233 | 0.250 | 0.290 |

The determinants of second-tier market creation



Financial development and introduction of new second-tier exchanges.

| | (1) Second-tier | (2) Second-tier | (3) Second-tier | (4) Second-tier | (5) Second-tier | (6) Second-tier |
|------------------------------------|---------------------|---------------------|--------------------|---------------------|--------------------|--------------------|
| High credit/GDP (top quartile) | 0.405*** (0.104) | 0.326*** (0.106) | 0.304** (0.121) | | | |
| High market cap/GDP (top quartile) | | | | 0.399*** (0.101) | 0.277** (0.119) | 0.189 (0.137) |
| Pre-1990 second-tier exchange | 0.023 (0.126) | -0.062 (0.119) | -0.065 (0.134) | 0.083 (0.110) | 0.006 (0.111) | 0.017 (0.118) |
| ln(Population) | | -0.015 (0.044) | 0.016 (0.066) | | -0.026 (0.047) | 0.016 (0.069) |
| ln(GDP) | | 0.094** (0.039) | 0.081 (0.058) | | 0.089** (0.043) | 0.072 (0.059) |
| Region FE | No | No | Yes | No | No | Yes |
| Income group FE | No | No | Yes | No | No | Yes |
| Observations | 115 | 115 | 115 | 115 | 115 | 115 |
| R-squared | 0.131 | 0.202 | 0.264 | 0.134 | 0.179 | 0.232 |

The determinants of second-tier market creation



The timing of introduction of new second-tier exchanges (1).

| | (1) Second-tier | (2) Second-tier | (3) Second-tier | (4) Second-tier | (5) Second-tier | (6) Second-tier | (7) Second-tier | (8) Second-tier |
|--|---------------------|--------------------|----------------------|----------------------|---------------------|--------------------|--------------------|--------------------|
| Lagged market cap/GDP | 0.199*** (0.053) | 0.110** (0.055) | 0.191*** (0.041) | 0.189*** (0.044) | | | | |
| Lagged market cap/GDP × High shareholder protection | | | -0.167*** (0.051) | -0.201*** (0.047) | | | | |
| ln(1 + Lagged patents) | | | | | 0.072*** (0.027) | 0.060** (0.029) | 0.084** (0.036) | 0.078* (0.039) |
| ln(1 + Lagged High shareholder protection) | | | | | | | -0.024 (0.048) | -0.037 (0.048) |
| ln(GDP) | 0.125 (0.054) | 0.054 (0.168) | 0.133 (0.055) | 0.081 (0.146) | 0.077** (0.035) | 0.015 (0.096) | 0.079** (0.036) | 0.009 (0.088) |
| ln(population) | -0.189 (0.163) | -0.213 (0.172) | -0.208 (0.160) | | | | | |
| Country FE | Yes | Yes | Yes | | | | | |
| Year FE | No | Yes | No | Yes | No | Yes | No | Yes |
| Observations | 1777 | 1777 | 1777 | 1777 | 2063 | 2063 | 2063 | 2063 |
| R-Squared | 0.088 | 0.140 | 0.073 | 0.146 | 0.093 | 0.127 | 0.094 | 0.131 |

in countries with better minority shareholder protection was significantly less sensitive to fluctuations in the value of the stock market.

a surge of innovation seems to be a powerful spur to second- tier market development, regardless of the extent of legal protections.

The determinants of second-tier market creation



The timing of introduction of new second-tier exchanges (2).

| | (1) Second-tier | (2) Second-tier | (3) Second-tier | (4) Second-tier | (5) Second-tier | (6) Second-tier | (7) Second-tier | (8) Second-tier |
|--|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|--------------------|--------------------|
| Lagged $\ln(1 + \# \text{ IPOS})$ | 0.060*** (0.015) | 0.057*** (0.016) | 0.052*** (0.018) | 0.051*** (0.019) | | | | |
| Lagged $\ln(1 + \# \text{ IPOS}) \times$ High shareholder protection (top quartile) | | | 0.023 (0.033) | 0.020 (0.032) | | | | |
| Lagged $\ln(1 + \text{IPO proceeds})$ | | | | | 0.014*** (0.004) | 0.012*** (0.004) | 0.012** (0.005) | 0.010* (0.005) |
| Lagged $\ln(1 + \text{IPO proceeds}) \times$ high shareholder protection | | | | | | | 0.007 (0.011) | 0.006 (0.011) |
| $\ln(\text{GDP})$ | | | | | 0.103** (0.050) | -0.017 (0.092) | 0.102** (0.050) | -0.017 (0.092) |
| $\ln(\text{population})$ | | | | | -0.049 (0.181) | -0.109 (0.199) | -0.047 (0.179) | -0.107 (0.197) |
| Country FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year FE | No | Yes | No | Yes | No | Yes | No | Yes |
| Observations | 2566 | 2566 | 2566 | 2566 | 2566 | 2566 | 2566 | 2566 |
| R-squared | 0.090 | 0.117 | 0.092 | 0.118 | 0.068 | 0.098 | 0.069 | 0.099 |

These results are robust, and the coefficients stable, when we add interactions with the measure of shareholder protection and year fixed effects.



The determinants of second-tier market creation

✓ which countries were more likely to introduce second-tier exchanges and when.

□ Shareholder protection

□ Innovation

□ Financial development

■ market capitalization

■ patent applications

■ IPO activity

} demand for
entrepreneurial
capital

The drivers of second-tier market success

Relation between incumbent first-tier and new second-tier exchanges activity

| | (1) ln(1 + # IPOs) First-tier | (2) ln(1 + # IPOs) First-tier | (3) ln(1 + IPO proceeds) First-tier | (4) ln(1 + IPO proceeds) First-tier |
|--|-------------------------------------|-------------------------------------|---|---|
| ln(1 + # IPOs) – Second-tier | 0.078 (0.083) | 0.094 (0.087) | | |
| ln(1 + # IPOs) – First-tier – pre-period | 1.029*** (0.041) | 1.039*** (0.038) | | |
| ln(1 + IPO proceeds) – Second-tier | | | 0.138 (0.082) | 0.133 (0.086) |
| ln(1 + IPO proceeds) – First-tier – pre-period | | | 0.925*** (0.082) | 0.926*** (0.085) |
| Pre-1990 second-tier exchange | -0.445 (0.271) | -0.546** (0.240) | -1.156 (0.722) | -1.815*** (0.636) |
| ln(Population) | 0.221 (0.146) | 0.204 (0.204) | -0.683** (0.323) | -0.399 (0.374) |
| ln(GDP) | -0.237 (0.152) | -0.245 (0.192) | 0.183 (0.372) | -0.012 (0.370) |
| Entry year FE | Y | Y | Y | Y |
| Income group FE | N | Y | N | Y |
| Region FE | N | Y | N | Y |
| Observations | 184 | 184 | 184 | 184 |
| R-squared | 0.749 | 0.756 | 0.654 | 0.664 |

about one, suggesting the persistence of IPO activity in the existing stock market exchanges

The drivers of second-tier market success



Shareholder protection and the performance of new second-tier exchanges

Panel A – Shareholder protection and the performance of new second-tier exchanges

| | (1) ln(1 + # IPOs) | (2) ln(1 + # IPOs) | (3) ln(1 + IPO proceeds) | (4) ln(1 + IPO proceeds) |
|--|-----------------------|-----------------------|-----------------------------|-----------------------------|
| High shareholder protection (top quartile) | 0.562** (0.227) | 0.615*** (0.203) | 0.936** (0.357) | 1.020*** (0.328) |
| Pre-1990 second-tier exchange | -0.192 (0.198) | -0.174 (0.194) | -0.356 (0.341) | -0.317 (0.329) |
| ln(GDP) | 0.178*** (0.062) | 0.154** (0.068) | 0.511*** (0.115) | 0.538*** (0.154) |
| ln(Population) | -0.071 (0.067) | -0.033 (0.082) | -0.290** (0.121) | -0.296 (0.177) |
| Observations | 1451 | 1451 | 1451 | 1451 |
| R-squared | 0.359 | 0.368 | 0.342 | 0.352 |
| Year FE | Yes | Yes | Yes | Yes |
| Entry year FE | Yes | Yes | Yes | Yes |
| Region FE | No | Yes | No | Yes |

Shareholder protection and the performance of new second-tier exchanges

Panel B – Innovation and the performance of new second-tier exchanges

| | (1) ln(1 + # IPOs) | (2) ln(1 + # IPOs) | (3) ln(1 + # IPOs) |
|--|-----------------------|-----------------------|-----------------------|
| High shareholder protection (top quartile) | 0.528** (0.229) | 0.574*** (0.054) | 0.545*** (0.054) |
| High venture capital (top quartile) | 0.278* (0.140) | | 0.221*** (0.058) |
| High patents (top quartile) | | 0.435*** (0.069) | 0.387*** (0.070) |
| Pre-1990 second-tier exchange | -0.174 (0.192) | -0.257*** (0.058) | -0.236*** (0.058) |
| ln(GDP) | 0.140* (0.072) | 0.113*** (0.034) | 0.089*** (0.034) |
| ln(Population) | -0.058 (0.068) | -0.055* (0.033) | -0.046 (0.033) |
| Observations | 1451 | 1451 | 1451 |
| R-squared | 0.369 | 0.376 | 0.383 |
| Year FE | Yes | Yes | Yes |
| Entry year FE | Yes | Yes | Yes |

The drivers of second-tier market success



Financial development and the performance of new second-tier exchanges.

Panel C – Financial development and the performance of new second-tier exchanges.

| | (1) ln(1 + # IPOs) | (2) ln(1 + # IPOs) | (3) ln(1 + # IPOs) |
|--|-----------------------|-----------------------|-----------------------|
| High shareholder protection (top quartile) | 0.569** (0.245) | 0.563*** (0.070) | 0.591* (0.299) |
| Credit/GDP | 0.003*** (0.001) | | 0.004** (0.002) |
| Market cap/GDP | | 0.001*** (0.000) | 0.001 (0.001) |
| Pre-1990 second-tier exchange | -0.310 (0.219) | -0.232*** (0.074) | -0.485* (0.243) |
| ln(GDP) | 0.058 (0.076) | 0.113** (0.055) | -0.021 (0.106) |
| ln(Population) | 0.048 (0.092) | 0.032 (0.051) | 0.175 (0.136) |
| Observations | 1254 | 1067 | 985 |
| R-squared | 0.372 | 0.397 | 0.430 |
| Year FE | Yes | Yes | Yes |
| Entry year FE | Yes | Yes | Yes |



The drivers of second-tier market success

➤ **shareholder protection**

- **venture capital activity**
- **Patenting**
- **credit**
- **stock market**

Firm listing choice and listing requirements



Listing characteristics in new second-tier exchanges.

| IPO characteristics: | (1) ln(Age) | (2) ln(Total Assets) | (3) EBITDA / Assets | (4) Profitable at IPO | (5) IPO proceeds / assets | (6) Annualized assets growth | (7) Annualized revenue growth |
|--|----------------------|----------------------------|---------------------------|-----------------------------|------------------------------------|---------------------------------------|--|
| High shareholder protection (top quartile) | -0.521*** (0.094) | -0.878*** (0.167) | -0.243*** (0.019) | -0.426*** (0.037) | 0.633*** (0.056) | 0.053*** (0.009) | 0.052*** (0.005) |
| Pre-1990 second-tier exchange | -0.426* (0.217) | -1.555*** (0.324) | -0.285*** (0.053) | -0.518*** (0.099) | 0.485*** (0.083) | 0.053*** (0.014) | 0.060*** (0.013) |
| ln(GDP) | -0.172 (0.146) | 0.518** (0.208) | 0.057 (0.035) | 0.026 (0.061) | 0.032 (0.093) | 0.006 (0.009) | 0.001 (0.006) |
| ln(Population) | 0.208** (0.094) | -0.025 (0.137) | -0.039 (0.024) | 0.014 (0.042) | -0.009 (0.068) | 0.001 (0.007) | -0.001 (0.004) |
| Observations | 2972 | 2695 | 2434 | 2442 | 2695 | 2795 | 2604 |
| R-squared | 0.171 | 0.485 | 0.325 | 0.414 | 0.064 | 0.157 | 0.148 |
| Issuance year FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Exchange entry year FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

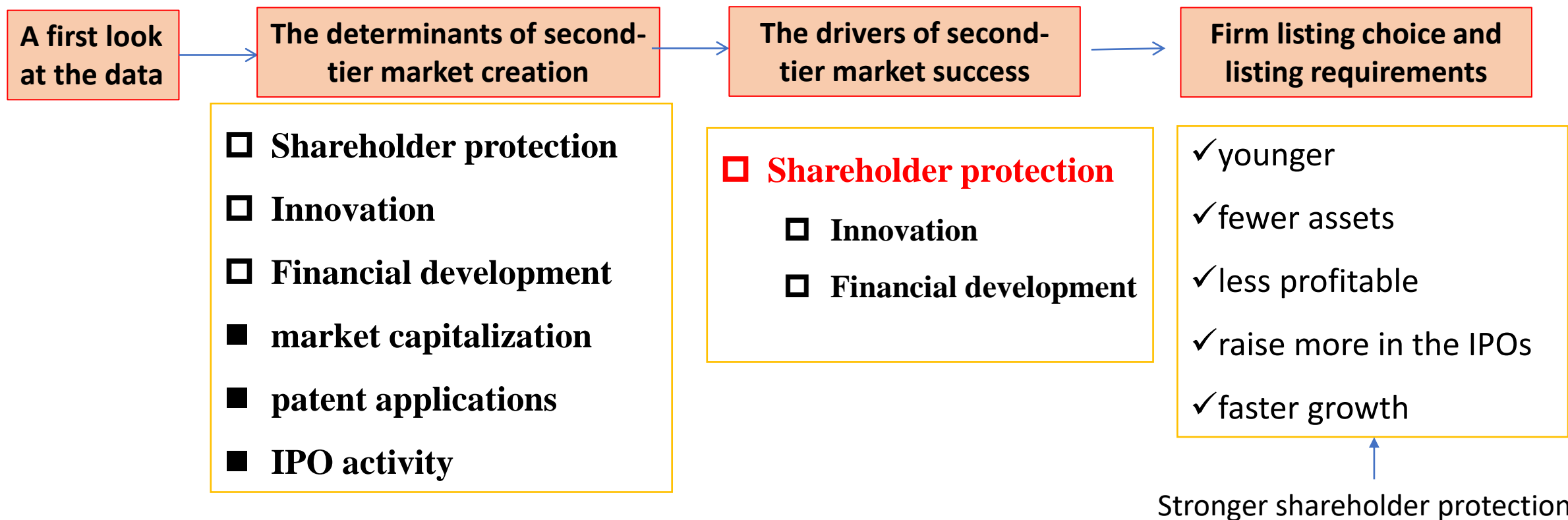
whether this pattern is due to the imposition of differing listing requirements in second-tier markets in nations with stronger investor protection?

Listing requirements in new second-tier exchanges

| | (1) Number of listing requirements | (2) Market cap | (3) Profitable years | (4) Paid-up capital | (5) Free float | (6) Min. number of shareholders | (7) Min. amount of equity owned |
|--|---|----------------------|----------------------------|---------------------------|-------------------|--|--|
| High shareholder protection (top quartile) | 0.147 (0.295) | -0.070 (0.151) | 0.115 (0.130) | 0.102* (0.051) | 0.031 (0.032) | 0.531 (1.184) | 0.012 (0.047) |
| Pre-1990 second-tier exchange | -0.593** (0.277) | 0.149 (0.147) | -0.214* (0.122) | -0.046 (0.042) | -0.012 (0.033) | 0.895 (0.981) | 0.034 (0.034) |
| ln(Population) | -0.207 (0.249) | -0.034 (0.118) | -0.086 (0.078) | -0.021 (0.040) | 0.039 (0.028) | -0.472 (1.116) | 0.036 (0.046) |
| ln(GDP) | 0.364* (0.207) | 0.035 (0.101) | 0.143* (0.074) | 0.022 (0.031) | -0.032 (0.026) | 0.187 (0.833) | -0.011 (0.034) |
| Entry year FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Region FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 74 | 74 | 74 | 74 | 74 | 74 | 74 |
| R-squared | 0.409 | 0.526 | 0.475 | 0.468 | 0.426 | 0.428 | 0.438 |

there was no statistically significant relation between shareholder protection and listing requirements.

Research Framework



- ❑ The increases in **demand for entrepreneurial capital led to the introduction** of second- tier exchanges. These markets **did not divert** offerings from existing first-tier exchanges, at least in the short run.
- ❑ Exchanges' **success was driven by the presence of strong shareholder protection**, even in countries with high levels of venture capital activity, patenting, private credit availability, and stock market valuations.
- ❑ Second-tier exchanges in countries with better shareholder protection allowed **younger (a 23% differential) and less profitable** (a 42% difference) companies to raise more capital.
- ❑ These results suggest the **importance of institutions** in facilitating the provision of entrepreneurial capital to young companies.

- Our findings are consistent with the broader literature **on law and finance**, particularly the subset of work that examines the impact of legal conditions on entrepreneurial finance.
- Our results highlight **the role of a country's institutions**, and shareholder protection in particular, as a potentially important ingredient in **the success of a newly established** second- tier market geared toward entrepreneurial companies.



Thank you!

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