

Área temática: Acumulação, indústria e transformação tecnológica (área 8)

Internationalization of Chinese titan digital platform firms: worldwide venture capital investments

Bruno Prado Prates

brunopradobrates@gmail.com

Centro de Desenvolvimento e Planejamento Regional, UFMG

ORCID: 0000-0003-3100-6731

Tulio Chiarini

tulio.chiarini@ipea.gov.br

Centro de Pesquisa em Ciência, Tecnologia e Sociedade, Ipea

ORCID: 0000-0002-3758-8413

Leonardo Costa Ribeiro

leonardocostaribeiro@gmail.com

Centro de Desenvolvimento e Planejamento Regional, UFMG

ORCID: 0000-0002-7772-9313

Abstract: The aim of this paper is to examine the worldwide venture investments made by the five major Chinese platform firms: Baidu, Alibaba, Tencent, JD.com, and NetEase (BAT+JN), using the Crunchbase dataset. Despite previous contributions to the understanding of big platform firms' expansion and internationalization strategies, more empirical evidence is needed, particularly for the Chinese case. Our analysis reveals differences in the expansion and internationalization strategies adopted by BAT+JN. The results indicate that Tencent and Alibaba are more aggressive in their investments compared to the other firms, and all of them are expanding into various sectors, indicating their aim to establish a comprehensive digital ecosystem.

Keywords: Platform Economics; Venture Capital; Internationalization; China; Crunchbase

Jel-code: L24; L52; O38

Resumo: O objetivo deste artigo é examinar os investimentos de risco em todo o mundo feitos pelas cinco principais empresas de plataforma chinesas: Baidu, Alibaba, Tencent, JD.com e NetEase (BAT+JN), usando o conjunto de dados da Crunchbase. Apesar das contribuições existentes para a compreensão das estratégias de expansão e internacionalização das grandes empresas de plataforma, mais evidências empíricas são necessárias, particularmente para o caso chinês. A análise presente nesse artigo revela diferenças nas estratégias de expansão e internacionalização adotadas pela BAT+JN. Os resultados indicam que a Tencent e a Alibaba são mais agressivas em seus investimentos em comparação com as outras empresas e todas estão se expandindo em vários setores, indicando seu objetivo de estabelecer um ecossistema digital abrangente.

1. Introduction

The intense transformations in economic and social systems due to digital platforms have attracted academic interest. Scholars view them as a key factor in the restructuring of data, money, and power flows (KENNEY; ZYSMAN; BEARSON, 2020), leading to a new world order (RIKAP; LUNDVALL, 2021) and to a new kind of social order (GAWER, 2014). The rise of the platform economy is redefining power structures (VAN DIJCK; NIEBORG; POELL, 2019; ZUBOFF, 2019) and is considered one of the “most prominent phenomena after the global financial crisis in 2008” (LI; QI, 2022, p. 01).

Digital platforms are socio-technically structured virtual spaces where participants interact based on technically framed rules (DOLATA; SCHRAPE, 2022) and form digitally orchestrated networks with different levels powers (VAN DIJCK; POELL; WAAL, 2018). The controller – i.e., the digital platform firm that owns a digital platform – assumes dominant market positions, detours regulations, and operates at different spatial scales than other participants in the network (GRAHAM, 2020). Consequently, digital platform firms are “not identical with their [digital] platforms but represent, rather, the organized places of strategic decision-making and the management of the platforms they own” (DOLATA; SCHRAPE, 2022, p. 10).

The extent of the impact of giant platform firms is global and both the U.S. and China hold prominent positions. According to UNCTAD (2019), the traditional center-periphery divide is challenged by China’s emergence as a global competitor, consistently contending with the U.S. for dominance in key digital technologies. In fact, in the digital realm, both the U.S. and China have become critical pivotal centers of influence (LI; QI, 2022): “these two countries account for 75% of all patents related to blockchain technologies, 50% of global spending on IoT, and more than 75% of the world market for public cloud computing. And, (...) they account for 90% of the market capitalization value of the world’s 70 largest digital platforms.” (UNCTAD, 2019, p. xvi).

The existing literature has demonstrated that big platform firms have aggressive expansion and internationalization strategies, which contribute to their increase in power (LI; QI, 2022). Additionally, research has showed that the network externalities of digital platforms can influence the international strategic posture of controlling firms. However if they cannot rely on their existing user base to establish a competitive advantage in foreign markets, they will utilize other forms of firm-specific advantages that are not tied to location, such as technology, brand, and organizational capabilities, to make international expansion feasible (STALLKAMP; SCHOTTER, 2021).

In the case of U.S., studies have revealed that GAFAM’s merger and acquisition (M&A) strategies are driven by factors such as geographic expansion; the search for new technological capabilities; competitive concerns; and by capital concentration and centralization (GAUTIER; LAMESCH, 2021; PARKER; PETROPOULOS; VAN ALSTYNE, 2021; RIKAP; LUNDVALL,

2020, 2021). For instance, from 1988 to 20220, these companies have made numerous acquisitions, with Google (Alphabet) acquiring 249 companies; Amazon acquiring 107; Facebook (Meta) 102 companies; Apple 128 firms; and, Microsoft 269 companies (PARKER; PETROPOULOS; VAN ALSTYNE, 2021). Additionally, there is evidence of GAFAM's funding investment relationships with startups globally, which serve as an intangible asset investment strategy (SAHUT; DANA; TEULON, 2021). Similarly, Chinese platform firms have aggressive strategies as well (DIEGUES; ROSELINO, 2021), with strong participation in venture funding of emerging U.S. companies and the deepening of strategic partnerships (GONZALES; OHARA, 2019). Evidence shows that Alibaba and Tencent are expanding internationally (LI; QI, 2022) and utilizing cross-investments schemes to facilitate traffic funneling and data sharing (JIA; KENNEY, 2021).

Despite previous research that has explored the expansion and internationalization of big platform firms, further empirical evidence is necessary, particularly in the case of China. Thus, the aim of this study is to investigate the worldwide venture investment activities of the five prominent Chinese platform firms – Baidu, Alibaba, Tencent, JD.com, and NetEase (BAT+JN) – using Crunchbase dataset, addressing as well the venture capital investments in Brazil.

The analysis of venture investments is crucial in the platform economy, as big platforms use this strategy to preserve their existing critical resources and acquire new ones, and to mitigate against potential changes in resource boundaries brought about by new technologies and business models (LI; QI, 2022). The current study focuses on the number of investments made by the venture capital funds of BAT+JN's and aims to expand on the work of Gonzales and Ohara (2019), who used the same dataset, but only examined Chinese venture investors in the U.S.. This study is more specific in terms of Chinese firms considered (limited to BAT+JN) and less restrictive in terms of geographical location (not just the U.S.). Additionally, this paper contributes to the description of BAT+JN's venture investments in Brazil.

The structure of the paper is as follows. In section 2, we provide a comprehensive overview of two critical elements in China that are essential for understanding the Chinese platform economy: the state planning of China and the role of venture capital in the development of the Internet in the country. In section 3, we highlight both the advantages and limitations of the database utilized in the study. In section 4, we present a concise descriptive analysis of data. Section 5 presents the analysis of the results in relation to recent literature on China's digital platform economy and also includes a brief discussion of BAT+JN's venture capital investment in Brazilian companies. Finally, in the last section, paper concludes with some closing remarks.

2. Broad context

The internationalization strategies of Chinese titan digital platform firms can be interpreted, in addition to commercial intentions, in a context of knowledge absorption in the digital sector. The literature on National Innovation System (FREEMAN, 1987; LUNDVALL, 1992; NELSON, 1993) explains that, for an emerging country to economically reach the industrial powers, it is necessary to create external knowledge absorption mechanisms (FREEMAN, 1995) similar to the absorptive capacities that are fundamental for learning within firms (COHEN; LEVINTHAL, 1990).

That been said, at least two intertwined factors seem to us relevant: Chinese state planning and the role of venture capital in the development of the Internet in China.

2.1.Chinese State planning actions and strategies

The intentional establishment of the Chinese Innovation System took a long historical process, with roots in the modernization strategies after the founding of the People's Republic in 1949 (SUN, YIFEI, 2002). After the Reform and Opening-Up in late 1970s, measures to absorb foreign knowledge were intensified, with the arrangement of “Special Economic Zones” (SEZs) and strategies¹ which first incentivized international mergers and acquisitions (M&A) and later outward direct investments. Those strategies, at one hand, offered foreign companies access to local market, in addition to benefits granted by the government, in exchange for access to the knowledge held by these companies (MU; LEE, 2005); and on the other encouraged Chinese investment overseas² (KEUN LEE, 2022). In this context, both M&A and going global became an important part of China’s learning and knowledge access strategy, allowing Chinese companies to acquire foreign advanced technologies and brands.

In terms of industrial policies, 2006 was a decisive milestone: the launch of the “National Medium and Long-Term Plan for the Development of Science and Technology” (2006–2020) (MLP). Other projects were added to this long-term concept, such as “Made In China 2025”; “Internet Plus Program”; “Strategic Emerging Industries” and the “Innovation-Driven Development Strategy” (NAUGHTON, 2021).

Since 2006, Chinese industrial policy has undergone significant changes. The State started to assume a more incisive role in the conduct of science and technology policies, developing its State-led Innovation System (SUN, YUTAO; CAO, 2021). An important mechanism of state intervention is the State-owned Assets Supervision and Administration Commission of the State Council (SASAC), the agency responsible for centralizing control of large state-owned conglomerates.

¹ “Trading Market for Technology” and the “Going Global” (*zouchuqu*) strategies.

² Two main motivations are pointed for government policy change towards outward direct investment: first, the macroeconomic dimension, with “high domestic saving rates, global financial imbalance, and efforts to cool investment demand at home” (p. 126), pressing for less control over foreign exchange and to allow the outflow of capital; second, the “desire on the part of the Chinese government to create world-class companies and brands” (KEUN LEE, 2022, p. 126).

SASAC is the most advanced institutional element among the governance mechanisms of the Chinese State (JABBOUR; GABRIELE, 2021), and allows large state-owned companies to simultaneously pursue gains in competitiveness and strategic objectives formulated within the Communist Party of China. Consequently, the role of government, although often related to major innovations in capitalism – as in the case of the Internet (GREENSTEIN, 2015; MAZZUCATO, 2013) – occupies a particularly more significant place in China, with strong protection of Chinese digital platforms from international competition (RIKAP; LUNDVALL, 2021; UNCTAD, 2019). This characteristic is a possible explanation for the country's success in artificial intelligence (AI), as the data collected by the government can be used as an innovation tool by firms (BERAJA; YANG; YUCHTMAN, 2021; RIKAP; LUNDVALL, 2021).

Other programs were adopted later, reinforcing the strategic need to dominate the technological frontier (NAUGHTON, 2021). Two programs introduced in middle 2010s were particularly significant for the internationalization of Chinese digital platforms: “Made in China 2025” and “Internet Plus Program”. While the first established a series of strategic objectives, aiming at making China a “cyber power” mainly through the digitization of the industry (MARCATO, 2022), the second sought to integrate traditional sectors into the cutting-edge technology industry connected to the web (WANG, ZHU *et al.*, 2016), thus allowing the Chinese economy to be centered on information and communication technologies (ICT) (ZHOU, LIHONG; YING; WU, 2021). The official document of the Internet Plus Program mentions a series of actions related to the integration and development of the Internet, extending to sectors such as agriculture, energy, transport and commerce (NAUGHTON, 2018), with emphasis on IA and Internet of Things³.

In addition to the catch-up policies, the relationship between the Chinese government and digital companies was strengthened with the introduction of the “Belt and Road Initiative” at the end of 2013, which has become the defining policy of China's relationship with the global political economy (SHEN, 2018; WANG, HUIYAO, 2019). Chinese internet companies, driven by insatiable domestic demand, are eager to explore foreign markets and take advantage of the opportunities offered by the “Belt and Road Initiative” (HONG; HARWIT, 2020). As a result, the Chinese leadership has given internet companies a central role in the “Belt and Road Initiative”, leading to the creation of the “Digital Silk Road”, which has five major dimensions (FUNG *et al.*, 2018; SHEN, 2018).

The first dimension of the Digital Silk Road served a pioneering and fundamental role in reducing overcapacity in traditional industries (SHEN, 2018). It was pioneering because it helped

³ “Guiding Opinions of the State Council on Actively Promoting the ‘Internet Plus’ Action (2015)”. Available at: www.gov.cn/zhengce/content/2015-07/04/content_10002.htm. Accessed in Jan./2023.

meet the need for external markets after the 2008 financial crisis, and fundamental because it facilitated international cooperation in the ICT sector, such as digital equipment and services. Secondly, the Digital Silk Road was also expected to act as an enabling infrastructure to assist other Chinese companies in going abroad. This strategy is often referred to in Chinese policy discourse as "borrowing the boat to reach the sea" (SHEN, 2018). Thirdly, the Digital Silk Road has an important financial dimension and supports the internationalization of the renminbi currency, with significant advancements in the development of the Cross-border Interbank Payment System (CIPS) as an alternative to the US-led Society for Worldwide Interbank Financial Telecommunications system (SHEN, 2018). Fourthly, the Digital Silk Road is aimed at constructing a China-centered digital Silk Road, connecting neighboring countries to China through infrastructure such as submarine, terrestrial, and satellite links⁴ (SHEN, 2018). Finally, the fifth dimension of the Digital Silk Road is the promotion of Internet-enabled inclusive globalization.

2.2.Chinese digital platform firms

In China, the history of Internet companies, to a large extent, relates to the history of the emergence of venture capital (VC) in late 1980s, justified by the need to promote science and technology funding (ZHANG, 2016). Chinese first VC firm was the China New Technology Venture Investment Corporation, founded in 1986 through a joint effort by the Ministry of Science and Technology (MOST) and the Ministry of Finance. Later, other VC firms were founded, largely under the control of local government bodies, state enterprises and state universities (ZHANG, 2016). However, VC investors, foreign and domestic, only started to find significant investment possibilities with the Internet boom that hit China in late 1990s. In the 2000s, five Internet and ICT companies financed by VC – AsiaInfo, UTStarcom, Sina, Sohu, and NetEase – conducted their IPOs on Nasdaq. “Such high-profile VC investments induced unprecedented market entries, signaling the actual advent of the VC era in China” (ZHANG, 2016, p. 68).

The relationship between VC and Internet firms helped to promote scientific and technological activity. There was a process of mutual geographic grouping of VC and tech companies, reinforcing interrelationships of supply and demand creation (ZHANG, 2016). These groupings resulted in mechanisms of increasing returns to scale, enabling greater accumulation of

⁴ That can be illustrated by the satellite system Beidou and the fact that: “The three big state-owned network operators—China Telecom, China Mobile, and China Unicom—for example, have participated in the consortium of the new SeaMeWe 5 submarine cable that connects Southeast Asia, the Middle East, and West Europe” (SHEN, 2018, p. 2692).

“knowledge, experience, expertise, networks, resources, and legitimacy within both the VC community and entrepreneur community”⁵ (ZHANG, 2016, p. 82).

As a consequence, in that period, “all successful Internet firms have been backed by VC, including the first-generation “big three portals,” or Sina, Sohu, and NetEase, and the new-generation BAT, or Baidu, Alibaba, and Tencent” (ZHANG, 2016, p. 86) and since then, the Internet has been the leading sector in VC investment in China. These firms have outperformed their international competitors in the domestic market and became the country's most dynamic sector, a result, that can be partly explained by the sector's huge domestic market, by cultural and political barriers for international companies (ZHANG, 2016), and the policies mentioned in the previous section.

The barriers are a particularity of China's relationship with the web. Since the 1990s, the Chinese government has maintained a monitoring and control system for the Internet, with a view to regulating the flows of information and the presence of international firms domestically. That was popularized as “Great Firewall”, in allusion to the Great Wall of China: “a virtual boundary, selectively separating Chinese cyberspace from the outside” (YANG, 2012, p. 52). These political (and cultural) barriers constitute a “Walled Garden” favoring the catching-up process of Chinese companies by promoting advantages in the domestic market in relation to their international competitors (YU; LAZONICK; SUN, 2016).

3. Methodology

3.1.Database

The data was sourced from Crunchbase, a commercial database of innovative companies, which gathers information from over 2 million registered entities. It was created in 2007, and its scope has increased over the past years; however, its coverage is not clearly defined and may vary across countries and sectors (DALLE; BESTEN; MENONI, 2017). The information available on companies (entities) comprise their size, location (city and levels), primary role (firm, group, investor), status (active or closed), type (for-profit or non-profit), founding date, industry group, estimated revenue range and brief description.

Crunchbase also contains extensive figures on risk financing, with information predating the creation of the database by many years and the coverage has been increasing significantly overtime (DALLE; BESTEN; MENONI, 2017). It organizes data regarding firms' funding rounds (more than

⁵ We note, therefore, the co-evolution of these firms and the creation of mutual benefits. As an example of this co-evolution, the Zhang (2016) mentions the case of Lei Jun, founder of the Kingsoft software group, which obtained its IPO in 2007. Later, Lei abandoned his post as chief executive of Kingsoft and founded another firm: Xiaomi, today a digital giant.

526 thousand events), including the total number of investors (over 238 thousand of which 33.6% are based in the U.S. and 5.9% in China,

Table 1) and their names, and indicating those who lead the investment in each round. In addition, the database also displays the type (VC, business angel, private equity etc.) and the amount of capital raised. Crunchbase is recognized as the “premier sources of VC data” (BELLAVITIS; FISCH; MCNAUGHTON, 2022).

It is remarkable that regional representation on Crunchbase is not homogeneous. It seems that dataset is more effective in identifying U.S. and Canadian firms (together both have over 1 million registered companies, i.e., about 50% of all data on Crunchbase). E.U. (including the U.K.) has about 380 thousand registered companies and Asia-Pacific (including China, India, Japan and South Korea) has about 300 thousand. Finally, it is important to mention that Crunchbase gets their data from three sources:

- investor network (more than 4,000 global investment firms submit monthly portfolio updates);
- active community contributors (executives, entrepreneurs, and investors actively contributes to company profile pages, ensuring that the dataset is always growing and improving); and,
- AI and machine learning (algorithms that validate data accuracy, scan for anomalies, and alert Crunchbase data science team of conflicts in the data).

With data in-house, Crunchbase data analysts provide manual data validation and curation, analyzing key interconnections in data to develop algorithms and provide valuable insights. In other words, Crunchbase is partially a crowd-sourced database, and it has mechanisms to verify the accuracy of data by applying machine learning algorithms to endorse data accuracy, examine inconsistencies and inform their data scientists of eventual discrepancies (FERRATI; MUFFATTO, 2020).

Table 1 – Number of investors and investees, by location

Location	Investors		Investees	
	Number	%	Number	%
U.S.	80,272	33.6	58,559	24.5
China	14,062	5.9	17,106	7.2
U.K.	13,561	5.7	13,697	5.7
E.U.*	10,150	4.2	9,743	4.1
L.A.**	4,223	1.8	4,995	2.1
Total	238,905	100.0	238,905	100.0

Source: Authors’ own. Data sourced from Crunchbase. Note: (*) European Union: Ireland, Spain, Austria, Portugal, Croatia, Greece, Finland, Belgium, Cyprus, Bulgaria, The Netherlands, Czech Republic, Poland, Sweden, Hungary, Denmark, Malta, Slovakia, France, Italy, Romania, Slovenia, Germany, Estonia, Latvia, Lithuania, Luxembourg; (**) Latin America: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, French Guiana, Guadeloupe, Guatemala, Haiti, Honduras, Martinique, Mexico, Nicaragua, Panama, Paraguay, Peru, Puerto Rico, Saint Barthelemy, Saint-Martin (France), St. Pierre and Miquelon, Uruguay, Venezuela.

3.3. Screening the firms

We understand digital multisided platform companies as traditional capitalistic organizations, “not identical with their [digital] platforms but represent, rather, the organised places of strategic decision-making and the management of the platforms they own” (DOLATA; SCHRAPE, 2022, p. 10). In practical terms, this means that a platform company is a firm (a corporation) just like firms a hundred years ago, however, organizational innovation is in the organizational structure the firm controls: a digital service space.

Having that in mind, our first step departed from the biggest twenty digital multisided platform companies listed in Fortune’s Digital 100 identified by Acs *et al.* (2021). We selected only the Chinese firms: Baidu, Alibaba, Tencent, JD.com, and NetEase (BAT+JN) (

Table 2, annex). We also considered their own corporate venture investment arms: Baidu Ventures, Alibaba Entrepreneurs Fund, Jindong Capital Investment, and, NetEase Capital. No information was available about Tencent Investments on Crunchbase. We decided to include firms’ venture investment arms as their aim “is to maintain and strengthen the power of big tech, but it is reinforced with financialized aims, that is the pursuit of financial gains” (LI; QI, 2022, p. 19).

Having the previous companies as “seed nodes”, we were able to gather other companies found within funding investment relationships within one degree of separation from BAT+JN⁶. From the 14 thousand Chinese investors (

Table 1), we are considering only BAT+JN whose investments were made in 955 other distinct firms (either domestically or abroad), as we present in section 4. There are cases in which BAT+JN invested in the same company⁷; on this term, we are talking about 1,018 companies.

3.4. Data adjustments: “the industry-technology puzzle”

One particular interest in this study regards the diversification strategies of BAT+JN, that is, do they transcend the boundaries of industrial sectors? Crunchbase does not provide a nomenclature of economic activities commonly used by governmental statistical offices as NACE (in the European case) or NAICS (in the case of the U.S.). Rather, it organizes the companies’ data according to industry group. According to Crunchbase “Industry Groups are broader subjects that encompass multiple industries. Industries are more specific market segments.” Company profiles

⁶ The search happened in Dec./2022.

⁷ Ele.me – a Chinese digital platform mainly engaged in online take-out, new retail, instant delivery and catering supply chain – illustrates that: it was funded by 13 investors of which Alibaba, Tencent and JD.com. (<https://www.ele.me/>). Another example is Farfetch – a British luxury e-commerce platform. It was funded by 27 investors of which Alibaba, JD.com and Tencent. (<https://www.farfetch.com/>).

can belong to multiple industries (and industry groups), normally 3-5 groups. That is a remarkable feature of Crunchbase as since 2000s there are great changes in the nature of industries and markets and “sectoral boundaries dissolved under the onslaught of technology” (JACOBIDES; LIANOS, 2021, p. 1132)

The 47 “industries” available are: Administrative Services; Advertising; Agriculture and Farming; Apps; Artificial Intelligence; Biotechnology; Clothing and Apparel; Commerce and Shopping; Community and Lifestyle; Consumer Electronics; Consumer Goods; Content and Publishing; Data and Analytics; Design; Education; Energy; Events; Financial Services; Food and Beverage; Gaming; Government and Military; Hardware; Health Care; Information Technology; Internet Services; Lending and Investments; Manufacturing; Media and Entertainment; Messaging and Telecommunications; Mobile; Music and Audio; Natural Resources; Navigation and Mapping; Other; Payments; Platforms; Privacy and Security; Professional Services; Real Estate; Sales and Marketing; Science and Engineering; Software; Sports; Sustainability; Transportation; Travel and Tourism; and, Video.

A limitation of these categories is that Crunchbase does not differentiate “technology” from “industry”. For example, Kuaishou⁸ – a Chinese firm that provides an online video platform allowing its users to broadcast daily activities and also raised funds from Tencent – is classified as: AI; mobile apps; photo sharing; social network; and video streaming. In other cases, there are too many “industries” presented: Gojek⁹ – an Indonesian company based in Jakarta that controls a digital platform providing a variety of services from payments, food delivery, transportation and logistics and received investments from Tencent in some of its funding rounds – is categorized within six “industries”: consumer applications; e-commerce; food delivery; logistics; payments; and, transportation. It is clear that those classifications are problematic and can lead to misleading conclusions as they are not precise (SAVIN; CHUKAVINA; PUSHKAREV, 2022).

Besides imprecision, there are redundant classes in companies’ profiles and in some cases, there are insufficient number of classes available:

Crunchbase industry classes are often too narrow or too wide ranging from less than 1% for Government and Military to almost 38% for Software of all startups with the mean being 6.4%, standard deviation 6.8%, and the coefficient of variation being 1.06. This makes the classes hardly comparable. Software, for example, could be related to (cyber) security, data analysis, games, and many other areas. (SAVIN; CHUKAVINA; PUSHKAREV, 2022, p. 11).

To minimize such deficiencies, scholars have been following different strategies. Savin et al. (2022), for instance, applied the structural topic modeling approach “to elicit topics from

⁸ <https://www.kuaishou.com/>, accessed in Feb./2023.

⁹ <https://www.gojek.io/>, accessed in Feb./2023

companies' descriptions and classify them according to these topics" (SAVIN; CHUKAVINA; PUSHKAREV, 2022, p. 06). Although "in comparison to the Crunchbase classification, STM [structural topic modeling] approach produces topics that are better distinguishable and more concrete" (SAVIN; CHUKAVINA; PUSHKAREV, 2022, p. 12) identifying 38 topics based on the full descriptions of 250,226 firms in their sample, "the industry-sector puzzle" has not vanished, as the sector versus technology problem was not solved.

As it is not the objective of this paper to provide a new classification method for Crunchbase industries, we separated what "technologies" from their application areas. For example, AI, cloud computing, data science technologies, software, hardware, augmented reality technologies, quantum computing, advanced materials are a set of technologies related to science and engineering field.

4. First findings: descriptive data

The BAT+JN funding investments are spread throughout the world, as shown in Figure 3 in the Annex. Flows can be seen both within China and to many other countries, mainly in the global North. Despite this, data reveals that 60% of the distribution of BAT+JN funding investment in venture capital occurred domestically, followed by investments in companies based in the US (15.4%). In Asia, the most prominent countries receiving investment are Singapore (1.4%) and Indonesia (1.2%). Most companies receiving investment were founded recently, mainly after 2009, with a peak in 2014 (Figure 1). On the international level, this period coincides with the post-financial crisis of 2008. In fact, 75% of the total firms receiving investment were established in the past decade, and 25% of them in the last five years (Figure 2), indicating that they are mainly start-ups and new entrants. In China, following this trend, the context is one of a more incisive industrial policy after the MLP, in addition to encouraging the internationalization of companies through the Digital Silk Road from 2013 onwards, as mentioned in section 2. As a result, we observe an increase in the number of firms being invested by BAT+JN.

The BAT+JN group does not have an uniform VC investment strategy. Based on the number of investees, Tencent funded 52.1% of them, followed by Alibaba (21.6%) and Baidu (14.4%) (

Table 2). Comparatively, JD.com (8.2%) and NetEase (3.7%) have a smaller investment footprint. The same pattern is observed in the number of funding rounds: BAT is more voracious in investing in VC (concentrating 89.6% of total funding rounds) while JD.com and NetEase invest less (

Table 2).

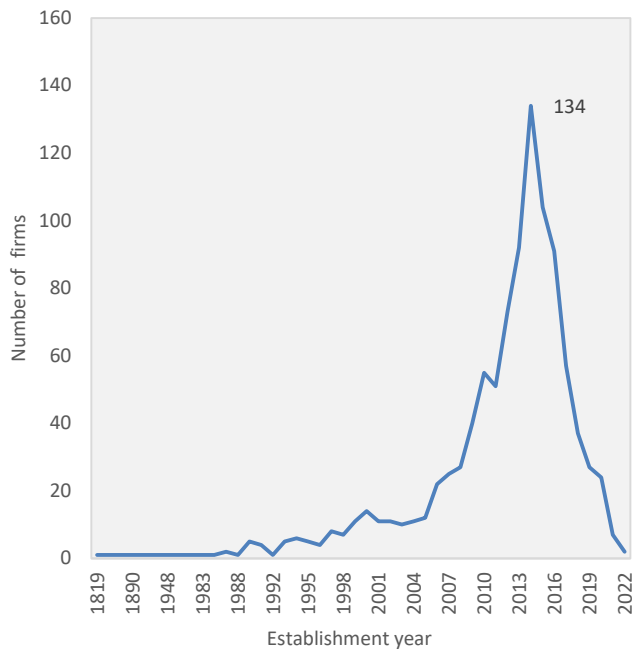


Figure 1 – Number of firms by year of establishment

Source: Authors’ own. Data sourced from Crunchbase. Note: 1.1% of our sample did not provide information about the year of establishment.

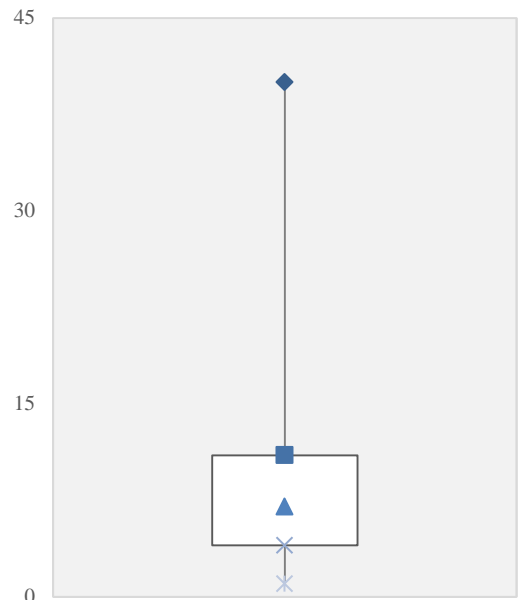


Figure 2 – Box-plot, firms’ age

Source: Authors’ own. Data sourced from Crunchbase. Note: 1.1% of our sample did not provide information about the year of establishment. In addition, we opt to exclude nine companies from this figure, once they were established before 1980s.

There are notable differences within the BAT+JN group with regards to geographical choices for their VC investments, as shown in

Table 3. While BAT and NetEase invested in VC in U.S. firms, JD.com invested in a few companies in other countries such as Germany, France, and Indonesia, but not in the U.S. Alibaba and Tencent, on the other hand, have a more diversified strategy in terms of allocating their VC investments globally.

Table 2 – BAT+JN investments

Investors	Investees		Funding rounds	
	Number	%	Number	%
Baidu	147	14.4%	270	18.2%
Alibaba	220	21.6%	321	21.6%
Tencent	530	52.1%	739	49.8%
JD.com	83	8.2%	96	6.5%
NetEase	38	3.7%	59	4.0%
Total	1,018	100.0%	1485	100.0%

Source: Authors’ own. Data sourced from Crunchbase.

The distribution by sector reveals that BAT+JN invests in various sectors. This is a common strategy among platform firms (ZUBOFF, 2019) “to establish a digital ecosystem, which can lock in users, producing user data and converting it into valuable assets for the platform companies” (LI; QI, 2022, p. 13). It is noticeable that BAT+JN venture invests mainly in “science and engineering” fields

(24.0%), followed by “media and entertainment” (9.4%) (Box 4). In terms of technologies, the main targets are Software (42.9%), AI (21.0%) and ICT in general (20.0%), suggesting that “China’s globalizing Internet”, that is, the process in which “the Chinese Internet entangled with transnational capital and manifesting a strong globalizing drive”, have as their main vector technologies such as “IA, big data, and cloud computing, all enabled by 5G networks” (HONG; HARWIT, 2020, p. 05). Several of these technologies are listed as the main ones on the frontier of the digital economy (UNCTAD, 2019), and some even represent expectations of technological transformations that are still largely uncertain, as in the quantum computing.

Table 3 – BAT+JN funding investments distribution by country, top-15

	Alibaba	Baidu	JD.com	NetEase	Tencent	Total	%
China	146	115	69	11	270	611	60.0%
U.S.	20	26		12	99	157	15.4%
U.K.	1		1	5	25	32	3.1%
India	8				22	30	2.9%
Hong Kong	15	1	2		3	21	2.1%
Singapore	3		2	1	8	14	1.4%
Germany	1		1		10	12	1.2%
Indonesia	2		2		8	12	1.2%
Israel	5	2			3	10	1.0%
Canada				1	7	8	0.8%
France			1	1	6	8	0.8%
Japan	2				6	8	0.8%
Brazil		1			6	7	0.7%
South Korea	1				6	7	0.7%
Australia				1	5	6	0.6%
Others	16	2	5	6	46	75	7.4%
Total	220	147	83	38	530	1018	100.0%

Source: Authors’ own. Data sourced from Crunchbase.

Box 4 – Sector group and technology group

Sector Group	%	Technology Group	%
Science and Engineering	24.0	Software	42.9
Media and Entertainment	9.4	Artificial Intelligence Systems	21.0
Commerce and Shopping	9.2	Information Technology	20.1
Finance Services	6.2	Data Science Technologies	6.5
Internet Services	6.0	Cloud Computing Technologies	4.1
Transportation	5.7	Augmented Reality Technologies	2.2
Gaming	5.4	Search Engine Technologies	1.9
Healthcare	4.7	Quantum Computing	0.4
Marketing	3.2	Advanced Materials	0.2
Others	26.2	Others	0.7

Source: Authors’ own. Data sourced from Crunchbase. Note: As presented in section 3.3, more than one sector group and technology group can be applied to the same company, therefore, there is double counting.

5. Discussions

Tencent is the most globalized firm among BAT+JN. It has a dominant position in China’s gaming industry and benefits from the fact that this is the largest game market in the world (JIA; KENNEY; ZYSMAN, 2018). This “global games publishing empire” was largely established through acquisition and equity investments, and it allowed the company to guide traffic to its international data

centers and build data centers abroad (JIA; KENNEY; ZYSMAN, 2018). This huge traffic of data empowered Tencent, so it could provide cloud solutions to other Chinese firms operating globally (JIA; KENNEY; ZYSMAN, 2018), coevolving, therefore, with Chinese State planning actions and strategies related to internationalization and catching-up ambitions. One of the most important developments of Tencent was the app WeChat, called “super app”, as it became a platform for other apps (JIA; KENNEY, 2021), i.e., an infrastructure (PLANTIN; DE SETA, 2019), and it is also Tencent’s primary source of big data (LUNDVALL; RIKAP, 2022). Later, WeChat expanded its scope to the financial service WeChat Pay, with a rapid growth in the number of users that enabled the penetration of digital services in China and became a key asset to attract other firms to cooperate with Tencent (JIA; KENNEY, 2021).

In Box 7 (annex), we present the top 5 most funded companies by BAT+JN. Most of Tencent’s top 5 are located in Asia: one in Japan (Kadokawa Corporation), one in India (Flipkart), and one in Singapore (Sea); the other two companies are in the U.S. (Uber and Tesla). These partnerships stress Tencent’s strategy towards AI and digital technologies, as e-commerce, games, ride-hailing, electric cars and media. Kadokawa Corporation, for instance, established as an “strategic alliance” with Tencent¹⁰, with involves the intellectual property in e-books, animations and game titles. Sea is an important company for the expansion in the global gaming market, and it caused controversy in India over the alleged Chinese control of the company¹¹.

Alibaba has e-commerce globalization as its top priority (JIA; KENNEY; ZYSMAN, 2018) and, differently from its U.S. counterpart (Amazon), it began as a platform offering separate architectures for B2B, C2C and B2C commerce (JIA; KENNEY, 2021). Alibaba plays a key role in the “Digital Silk Road” discourse (SEOANE, 2020) and it uses its cooperation with the “Belt and Road Initiative” signees¹² to expand its cloud computing arm, Alibaba Cloud (SHEN, 2018). With this strategy, in addition enabling computing infrastructure, the company helps to “export China-owned technical standards, which has become an increasingly important factor in the going out program as the leadership seeks to upgrade China’s industrial structure” (SHEN, 2018, p. 2689). Within the “Digital Silk Road” discourse, Alibaba has been advocating for the building of an Electronic World Trade Platform (eWTP), which “aims to eliminate barriers to commerce to promote free trade and help businesses and consumers everywhere participate in cross-border trade” (WU; GEREFFI, 2018, p. 344), and should play a counter-hegemonic role against U.S.-led globalization and infrastructure (SEOANE, 2020). Similar to Tencent, Alibaba also aims to build a global payment system with its platform Alipay, which forms, with WeChat, a duopoly in China’s payment sector (JIA; KENNEY, 2021).

¹⁰ https://ssl4.eir-parts.net/doc/9468/ir_material7/171248/00.pdf, accessed in Feb./2023.

¹¹ <https://www.ft.com/content/dcfb2481-29c3-4e50-9a72-c28bbdba696d>, accessed in Feb./2023.

¹² “As of January 6, 2023, China has signed more than 200 cooperation documents on the joint construction of the ‘Belt and Road’ with 151 countries and 32 international organizations”. See: https://www.yidaiyilu.gov.cn/info/iList.jsp?tm_id=126&cat_id=10122&info_id=77298, accessed in Feb./2023.

Alibaba's top 5 is also mostly from Asia, with one company from Singapore (Lazada Group), one from India (One97), one from Taiwan (RT-Mart), and one from Hong Kong (Sun Art Retail Group); the other one is from the U.S. (Lyft) (Box 7, annex). Lazada is an important target for Alibaba, as it works as a "vehicle for expansion into the Southeast Asia consumer market, including potential cross-border opportunities introducing Chinese merchants and international brands to Southeast Asian consumers" (WU; GEREFFI, 2018, p. 344). The e-commerce platform from Singapore also operates in Indonesia, Malaysia, the Philippines, Thailand, and Vietnam, and "provides local language options and mobile apps to cater to customers in each of the six markets" (WU; GEREFFI, 2018, p. 344).

Both Alibaba and Tencent have also globalized their research and development (R&D) facilities looking to promote innovation in cutting edge technologies:

Only two of Alibaba's new AI centres (called DAMO Academy) are in China. There are three in the US (Seattle, Sunnyvale and New York), one in Israel and one in Singapore. Alibaba claims that the DAMO Academy "aims to integrate science with industry and speed up information exchange" (Alibaba, 2019). These centres are close to leading research universities, looking both to profit from their research capabilities and attract talent. Tencent has also opened an AI research centre in Seattle. Furthermore, amongst the employees working in Chinese tech giants' US AI laboratories, there are not only U.S. elite university graduates but also former executives and scientists from Microsoft. (LUNDVALL; RIKAP, 2022, p. 08).

Baidu, JD.com and NetEase are considerably less globalized than Tencent and Alibaba. JD.com follow the pattern showed above, with most of its top 5 located in Asia (Box 7, annex). There are one company in Hong Kong (ESR), one in Indonesia (Traveloka), one in Vietnam (Tiki), one in Thailand (Pomelo Fashion), and one in the UK (Farfetch). It worth to note that JD.com itself was partly controlled by Tencent until 2021, when the company divests USD16 bi of shares from JD.com under Beijing's regulatory scrutiny¹³.

Baidu and NetEase, on the other hand, have their top 5 composed mostly by U.S. firms. In the case of Baidu, there are four US companies (Velodyne Lidar, Avail Medsystems, Ripcord, and RootPath Genomics), and one from Israel (Pixellot). This pattern reflects that "Baidu's globalization efforts have largely been confined to technology purchasing, establishing R&D laboratories in the United States, and a few small initiatives in the developing world" (JIA; KENNEY; ZYSMAN, 2018, p. 195). Most of its acquisitions and investments abroad are not for market entry, but for technology acquisition (JIA; KENNEY; ZYSMAN, 2018). One example is the acquisition, in 2017, of xPerception, an U.S. based startup that develops visual perception software and hardware, and it was meant to join Baidu's ambitions in autonomous driving technology¹⁴. In NetEase's top 5 there are three US companies (NextVR, Bungie, and Theocracy Games), one from UK (Kepler Interactive), and one from Nigeria (PalmPay), making NetEase the only BAR+JN company with an African firm in

¹³ <https://www.ft.com/content/64beca53-6359-411f-9c23-138c81ba6ef0>, accessed in Feb./2023.

¹⁴ <https://www.ft.com/content/aae6ee6f-9989-3795-a56a-200497ef37ba>, accessed in Feb./2023.

its top 5. PalmPay is a FinTech founded in 2019, which offers a digital wallet for more than 10 million users in Nigeria¹⁵.

Both Tencent and Alibaba stand out for controlling a global digital infrastructure, enabling them to exert power over smaller platforms (LI; QI, 2022). Our data supports the two points highlighted by Li and Qi on the distinct features of the platform economy: i – the platform economy is not homogenous, in fact, even between the giants of BAT+JN we can find significantly differences of strategies and control of one over another; ii – the expansion of platforms by networks effects is not sufficient to explain monopolization, so strategies of M&A and venture investments, for instance, are “crucial to maintain their existing critical resources and reproduce new ones” (LI; QI, 2022, p. 13).

Our analysis highlights some recent trends in China’s digital economy. The tightening of regulations over platforms, for example, affects their domestic and international strategies. In this regard, four areas have been most affected: antitrust, finance, cybersecurity and privacy, and cryptocurrencies (SCMP, 2021). The measures adopted by the government aim to reduce market concentration between platforms, avoid economic crises, protect personal information and ensure compliance with climate targets (SCMP, 2021). As a consequence, Tencent assumes to “invest less in platform companies to avoid the impression of forming [alliances] through investments, which is seen as problematic under China’s anti-monopoly focus”¹⁶. Another trend is the inhibition of platforms IPO’s, as Beijing has been hampering Chinese companies to list in other countries, particularly in the US. Recent cybersecurity measures have been adopted to make it difficult for platforms with large amounts of data to be listed outside of China, which has led some firms to suspend their listing plans (SCMP, 2021), as happened with the fintech Ant Group¹⁷, an Alibaba’s sister company. It can also be mentioned the growing geopolitical conflicts caused by the international expansion of Chinese platforms. As a form to circumvent these conflicts, the companies have been seeking strategies such as redirecting trade to Southeast Asia or hiding Chinese origins to facilitate access to Western markets (SCMP, 2021). There is no sign of these conflicts to soften, as the international expansion are likely to grow as a part of China’s industrial policy, at least until the project of China Standards 2035, which “defines China as the standard-bearer of technologies that define the 21st-century” (SCMP, 2021, p. 36).

5.1. And Brazil?

As data depicted in

Table 3 in section 4 shows, Brazil attracts 0.7% of total VC flows from BAT+JN. To be more precise, Brazil attracts only investments from Baidu and Tencent (Box 5).

¹⁵ <https://www.crunchbase.com/organization/palmpay>, accessed in Feb./2023.

¹⁶ <https://www.ft.com/content/dcfb2481-29c3-4e50-9a72-c28bbdba696d>, accessed in Feb./2023.

¹⁷ <https://www.ft.com/content/c1ee03d4-f22e-4514-af46-2f8423a6842e>, accessed in Feb./2023.

The now-extinct *Peixe Urbano* was developed in 2010, and it was an online platform that enabled users to find and book deals on restaurants, air tickets, beauty services, entertainment activities, and trade services according to their localities and preferences. Its success could be explained not only by the low prices of coupons offered but also by consumers' curiosity and desire to feel fashionable and inserted in that then-emerging context of virtual consumption (CÂMARA, 2015). *Peixe Urbano* had 20 million users registered on the platform, and it was acquired by Baidu in 2014¹⁸ for BRL 10 million and in 2017 it was sold to Mountain Nazca, a venture capital firm located in Chile (BRIGATTO, 2017), and it is no longer operating. It is hard to find evidences of why Baidu bought *Peixe Urbano* for an extravagant amount of money, however the amount of personal data it controlled can explain a little its motivation.

Peixe Urbano was the only firm in Brazil invested by Baidu. Tencent, on its turn, is much more aggressive. It has invested in six Brazilian companies, ranging from freight brokers to real-estate sector, all of them located in São Paulo, the epicenter of Brazilian digital platform economy (SILVA; CHIARINI; RIBEIRO, 2022). For instance, the first Tencent's venture investment in Brazil was the fintech Nubank in 2018: it received USD 200 million in exchange of 5% of control¹⁹. Since then, other companies started to attract venture investments as CargoX, founded in 2013 and it was called "Uber for trucks" as it has the mission to connect truck drives and cargo and gathered information about 15 thousand companies offering cargo to be transported and 80 thousand drivers to deliver them. In 2021, it was merged with Fretebras and FretePago to form Frete.com. Tencent, together with Japanese SoftBank, are the lead investors of CargoX²⁰. In the same year, Quinto Andar and Omie also attracted VC from Tencent (USD 120 million²¹ and BRL 580 million²², respectively). Other two companies – Cora²³ and Flash²⁴ – raised VC from Tencent. Again, it is hard to affirm for sure the reason why Tencent is buying those companies, but we can provide some hints that may help to make up the puzzle: Nubank has over 70 million clients²⁵; Quinto Andar allows over 6 thousand new contracts deals a month and it is already present in more than 30 Brazilian large cities²⁶. According to its CEO, "[With Tencent support,] we believe that by creating new means of payment it will be possible to unlock the market"²⁷. It is not hard to grasp that Tencent has interest to empower its platform WeChat Pay. Tencent and other big tech are financial institutions (LI; QI, 2022) and they are trying to build an

¹⁸ <http://glo.bo/1sjW3FL>, accessed in Oct./2022.

¹⁹ <https://exame.com/negocios/chinesa-tencent-compra-fatia-do-nubank-e-avalia-empresa-em-us-4-bilhoes/>, accessed in Feb./2023.

²⁰ <https://exame.com/exame-in/com-aporte-de-r11-bi-nasce-o-unicornio-grupo-frete-com/>, accessed in Feb./2023.

²¹ <https://exame.com/invest/minhas-financas/quintoandar-atrai-gigante-chines-tencent-em-novo-aporte-de-us-120-mi/>, accessed in Feb./2023.

²² <https://exame.com/exame-in/omie-recebe-aporte-da-tencent-em-extendao-da-rodada-serie-c/>, accessed in Feb./2023.

²³ <https://exame.com/pme/fintech-cora-600-milhoes-rodada-tiger-tencent/>, accessed in Feb./2023.

²⁴ <https://exame.com/exame-in/flash-captacao-serie-b-de-us-100-milhoes-para-modelo-de-hrtech/>, accessed in Feb./2023.

²⁵ <https://blog.nubank.com.br/nubank-alcanca-70-milhoes-de-clientes/>, accessed in Feb./2023.

²⁶ <https://conteudos.quintoandar.com.br/numeros-bilionarios-da-maior-imobiliaria-digital-do-brasil/>, accessed in Feb./2023.

²⁷ <https://exame.com/invest/minhas-financas/quintoandar-atrai-gigante-chines-tencent-em-novo-aporte-de-us-120-mi/>, accessed in Feb./2023.

ecosystem with a financial service. Who arrives first in Brazil gets all. And it seems that Tencent is targeting only “financial services” companies (as depicted in Box 5).

Box 5 – BAT+JN venture capital investments in Brazil

Firms	Description /Website	Sector	Location	Investor	Status
<i>CargoX</i>	It is a technology freight broker that provides shipping companies with a smart and efficient solution. https://www.cargox.com.br/	Information Services; Science and Engineering; Marketing; Financial Services	São Paulo	Tencent	Active
<i>Cora</i>	It is a fintech company that provides digital accounts for small and medium businesses. https://www.cora.com.br/	Commerce and Shopping; Financial Services	São Paulo	Tencent	Active
<i>Flash</i>	It focuses on food vouchers in Brazil creating an all-in-one instrument leveraging a MasterCard, a daily used App and an HR platform. https://www.flashapp.com.br/	Administrative Service; Financial Services; Science and Engineering	São Paulo	Tencent	Active
<i>Nubank</i>	It is a digital bank that offers digital credit cards, transfers, and payments	Financial Services	São Paulo	Tencent	Active
<i>Omie</i>	It is a software enterprise that develops Native Cloud ERP and CRM for small and medium companies. https://nubank.com.br/	Financial Services; Science and Engineering	São Paulo	Tencent	Active
<i>Peixe Urbano</i>	It was an online platform that enables users to find and book deals on restaurants, air tickets, beauty services, and more. www.peixeurbano.com.br/	Commerce and Shopping; Information Services; Travel and Tourism	Florianópolis	Baidu	Closed
<i>Quinto Andar</i>	It is a platform that simplifies the rental of residential real estate for landlords and renters https://www.quintoandar.com.br/	Internet Services; Real Estate; Science and Engineering;	São Paulo	Tencent	Active

Source: Authors’ own. Data sourced from Crunchbase.

6. Final comments

The study aimed to analyze the global venture investments made by five major Chinese platform firms: Baidu, Alibaba, Tencent, JD.com, and NetEase (BAT+JN). Despite the limitations of Crunchbase dataset, as presented in section 3, our analysis provided empirical evidences that BAT+JN do not have the uniform strategies for global expansion and internationalization. Nevertheless, they maintain control over many other young companies. The results indicate that Tencent and Alibaba have relatively more aggressive strategies than the other companies. Moreover, all of them expand into multiple sectors, showing their ambition to establish a digital ecosystem. This strategy “can lock in users, producing data and converting it into valuable assets for the platform companies” (LI; QI, 2022, p. 13).

The implications of the findings of this paper for startups, particularly those from the periphery, are significant. As we demonstrated in section 4, the majority (75%) of the firms analyzed in the study were established in the past decade and are therefore more vulnerable to having their financial control weakened by the massive buyouts and shareholdings of small platforms and tech startups by big platform companies as noted by Li and Qi (2022).

The financial control of small firms and the control of data, infrastructure, technological knowledge, and other strategic resources by the digital giants may result in unequal power relations

between platforms (LI; QI, 2022). Countries on the periphery may counteract this by pursuing strategies to absorb external knowledge (FREEMAN, 1995) and strengthen their domestic innovation capacity, reducing dependence on global platforms. In order to achieve technological progress and promote a vibrant digital economy, it is essential for countries on the periphery to pursue policies.

References

- ACS, Zoltan J. *et al.* The Evolution of the Global Digital Platform Economy: 1971-2021. *SSRN Electronic Journal*, 2021.
- BELLAVITIS, Cristiano; FISCH, Christian; MCNAUGHTON, Rod B. COVID-19 and the global venture capital landscape. *Small Business Economics*, v. 59, n. 3, p. 781–805, 4 out. 2022.
- BERAJA, Martin; YANG, David; YUCHTMAN, Noam. *Data-intensive Innovation and the State: Evidence from AI Firms in China.* , Discussion Paper., n° N. 1755. London: [s.n.], 2021.
- BRIGATTO, Gustavo. Baidu vende Peixe Urbano para fundo. *Valor Econômico*, out. 2017. Disponível em: <<https://valor.globo.com/empresas/noticia/2017/11/28/baidu-vende-peixe-urbano-para-fundo.ghtml>>.
- CÂMARA, Sara Talita Costa. *Consumo na cibercultura: uma etnografia sobre o valor da compra no e-commerce local Peixe Urbano.* 2015. 174 f. Universidade Federal do Rio Grande do Norte, 2015.
- COHEN, Wesley M.; LEVINTHAL, Daniel A. Absorptive Capacity: A New Perspective on Learning and Innovation. *Administrative Science Quarterly*, v. 35, n. 1, p. 128–152, 1990.
- DALLE, Jean-Michel; BESTEN, Matthijs Den; MENONI, Carlo. *Using Crunchbase for economic and managerial research.* , OECD Science, Technology and Industry Working Papers., n° No. 2017/08. Paris: Organisation for Economic Co-operation and Development (OECD): [s.n.], 2017.
- DIEGUES, Antônio Carlos; ROSELINO, José Eduardo. *Política industrial, tecno-nacionalismo e indústria 4.0: a guerra tecnológica entre China e EUA.* , Texto para Discussão n. 401. Campinas: [s.n.], 2021.
- DOLATA, Ulrich; SCHRAPE, Jan-Felix. *Platform Architectures: The Structuration of Platform Companies on the Internet.* , SOI Discussion Paper., n° 2022–01. Stuttgart: [s.n.], 2022.
- FERRATI, Francesco; MUFFATTO, Moreno. Using Crunchbase for Research in Entrepreneurship: Data Content and Structure. 2020, [S.l: s.n.], 2020. p. 11.
- FREEMAN, Chris. *Technology Policy and Economic Performance: Lessons from Japan.* London: Pinter Publishers, 1987.
- FREEMAN, Chris. The ‘National System of Innovation’ in historical perspective. *Cambridge Journal of Economics*, v. 19, p. 5–24, 1995.
- FUNG, K.C. *et al.* Digital silk road, Silicon Valley and connectivity. *Journal of Chinese Economic and Business Studies*, v. 16, n. 3, p. 313–336, 3 jul. 2018.
- GAUTIER, Axel; LAMESCH, Joe. Mergers in the digital economy. *Information Economics and Policy*, v. 54, n. C, p. 1–15, mar. 2021.
- GAWER, Annabelle. Bridging differing perspectives on technological platforms: Toward an integrative framework. *Research Policy*, v. 43, n. 7, p. 1239–1249, set. 2014.
- GONZALES, John; OHARA, Frank. Chinese venture investments in the United States, 2010-2017. *Thunderbird International Business Review*, v. 61, n. 2, p. 123–131, mar. 2019.
- GRAHAM, Mark. Regulate, replicate, and resist – the conjunctural geographies of platform urbanism. *Urban Geography*, v. 41, n. 3, p. 453–457, 15 mar. 2020.
- GREENSTEIN, Shane. *How the internet became commercial: innovation, privatization and the birth of a new network.* Princeton: Princeton University Press, 2015.
- HONG, Yu; HARWIT, Eric. China’s globalizing internet: history, power, and governance. *Chinese Journal of Communication*, v. 13, n. 1, p. 1–7, 2020.

- JABBOUR, Elias; GABRIELE, Alberto. *China: o socialismo do século XXI*. São Paulo: Boitempo, 2021.
- JACOBIDES, Michael G; LIANOS, Ioannis. Regulating platforms and ecosystems: an introduction. *Industrial and Corporate Change*, v. 30, n. 5, p. 1131–1142, 31 dez. 2021.
- JIA, Kai; KENNEY, Martin. The Chinese platform business group: an alternative to the Silicon Valley model? *Journal of Chinese Governance*, p. 1–23, 1 fev. 2021.
- JIA, Kai; KENNEY, Martin; ZYSMAN, John. Global Competitors? Mapping the Internationalization Strategies of Chinese Digital Platform Firms. In: TULDER, ROB VAN; VERBEKE, ALAIN; PISCITELLO, LUCIA (Org.). *International Business in the Information and Digital Age*. Bingley (UK): Emerald Publishing Limited, 2018. p. 187–215.
- KENNEY, Martin; ZYSMAN, John; BEARSON, Dafna. Transformation or Structural Change? What Polanyi Can Teach Us about the Platform Economy. *Sociologica*, v. 14, n. 3, p. 227–240, 2020.
- KEUN LEE. *China's Technological Leapfrogging and Economic Catch-up*. Oxford: Oxford University Press, 2022.
- LI, Zhongjin; QI, Hao. Platform power: monopolisation and financialisation in the era of big tech. *Cambridge Journal of Economics*, p. 1–26, 12 out. 2022.
- LUNDEVALL, Bengt-Åke. *National Innovation Systems: Towards a Theory of Innovation and Interactive Learning*. London: Pinter Publishers, 1992.
- LUNDEVALL, Bengt-Åke; RIKAP, Cecilia. China's catching-up in artificial intelligence seen as a co-evolution of corporate and national innovation systems. *Research Policy*, v. 51, n. 1, p. 104395, jan. 2022.
- MARCATO, Marilia Bassetti. The Made in China 2025 amid hyperglobalization: upgrading, intangible assets, and internationalization strategies. *Economia e Sociedade*, v. 31, n. 2, p. 355–384, maio 2022.
- MAZZUCATO, Mariana. *The Entrepreneurial State: Debunking Public vs. Private Sector Myths*. New York: Anthem Press, 2013.
- MU, Qing; LEE, Keun. Knowledge diffusion, market segmentation and technological catch-up: The case of the telecommunication industry in China. *Research Policy*, v. 34, n. 6, p. 759–783, ago. 2005.
- NAUGHTON, Barry. *The Chinese Economy: Adaptation and Growth*. Cambridge: The MIT Press, 2018.
- NAUGHTON, Barry. *The Rise of China's Industrial Policy*. Boulder: Lynne Rienner Publishers, 2021.
- NELSON, Richard R. *National innovation systems: a comparative analysis*. New York: [s.n.], 1993.
- PARKER, Geoffrey; PETROPOULOS, Georgios; VAN ALSTYNE, Marshall. Platform mergers and antitrust. *Industrial and Corporate Change*, v. 30, n. 5, p. 1307–1336, 31 dez. 2021.
- PLANTIN, Jean-Christophe; DE SETA, Gabriele. WeChat as infrastructure: the techno-nationalist shaping of Chinese digital platforms. *Chinese Journal of Communication*, v. 12, n. 3, p. 257–273, 3 jul. 2019.
- RIKAP, Cecilia; LUNDEVALL, Bengt-Åke. Big tech, knowledge predation and the implications for development. *Innovation and Development*, p. 1–28, 7 dez. 2020.
- RIKAP, Cecilia; LUNDEVALL, Bengt-Åke. *The Digital Innovation Race. Conceptualizing the Emerging New World Order*. Cham: Palgrave MacMillan, 2021.
- SAHUT, Jean-Michel; DANA, Léo-Paul; TEULON, Frédéric. Corporate governance and financing of young technological firms: A review & introduction. *Technological Forecasting and Social Change*, v. 163, p. 120425, fev. 2021.
- SAVIN, Ivan; CHUKAVINA, Kristina; PUSHKAREV, Andrey. Topic-based classification and identification of global trends for startup companies. *Small Business Economics*, 1 mar. 2022.
- SCMP. *The China Internet Report 2021*. Beijing: [s.n.], 2021.
- SEOANE, Maximiliano Facundo Vila. Alibaba's discourse for the digital Silk Road: the electronic World Trade Platform and 'inclusive globalization'. *Chinese Journal of Communication*, v. 13, n. 1, p. 68–83, 2 jan. 2020.
- SHEN, Hong. Building a Digital Silk Road? Situating the Internet in China's Belt and Road Initiative. *International Journal of Communication*, v. 12, p. 2683–2701, 2018.

- SILVA, Victo José; CHIARINI, Tulio; RIBEIRO, Leonardo Costa. The Brazilian digital platform economy: a first approach. *SocArXiv Papers*, p. 1–35, 2022.
- STALLKAMP, Maximilian; SCHOTTER, Andreas P. J. Platforms without borders? The international strategies of digital platform firms. *Global Strategy Journal*, v. 11, n. 1, p. 58–80, 28 fev. 2021.
- SUN, Yifei. China’s National Innovation System in Transition. *Eurasian Geography and Economics*, v. 43, n. 6, p. 476–492, 15 set. 2002.
- SUN, Yutao; CAO, Cong. Planning for science: China’s “grand experiment” and global implications. *Humanities and Social Sciences Communications*, v. 8, n. 1, p. 215, 20 set. 2021.
- UNCTAD. *Digital Economy Report. Value creation and capture: implications for developing countries*. . New York: United Nations Conference on Trade and Development: [s.n.], 2019.
- VAN DIJCK, José; NIEBORG, David; POELL, Thomas. Reframing platform power. *Internet Policy Review*, v. 8, n. 2, p. 1–18, 30 jun. 2019.
- VAN DIJCK, José; POELL, Thomas; WAAL, Martijn De. *The Platform Society: Public Values in a Connective World*. Oxford: Oxford University Press, 2018.
- WANG, Huiyao. China and globalization: 40 years of Reform and Opening-up and globalization 4.0. *Journal of Chinese Economic and Business Studies*, v. 17, n. 3, p. 215–220, 3 jul. 2019.
- WANG, Zhu *et al.* Internet Plus in China. *IT Professional*, v. 18, n. 3, p. 5–8, maio 2016.
- WU, Xinyi; GEREFFI, Gary. Amazon and Alibaba: Internet Governance, Business Models, and Internationalization Strategies - Volume 13. In: TULDER, ROB VAN; VERBEKE, ALAIN; PISCITELLO, LUCIA (Org.). . *International Business in the Information and Digital Age*. Wagon Lane: Emerald Publishing Limited, 2018. p. 327–356.
- YANG, Guobin. A Chinese Internet? History, practice, and globalization. *Chinese Journal of Communication*, v. 5, n. 1, p. 49–54, mar. 2012.
- YU, Zhou; LAZONICK, William; SUN, Yifei. Catching Up and Developing Innovation Capabilities in China’s Telecommunication Equipment Industry. In: ZHOU, YU; LAZONICK, WILLIAM; SUN, YIFEI (Org.). . *China as an Innovation Nation*. Oxford: Oxford University Press, 2016. p. 215–239.
- ZHANG, Jun. Venture Capital in China. In: ZHOU, YU; LAZONICK, WILLIAM; SUN, YIFEI (Org.). . *China as an Innovation Nation*. Oxford: Oxford University Press, 2016. p. 68–97.
- ZHOU, Lihong; YING, Minglei; WU, Jiang. Conceptualising China’s approach to ‘Internet Plus Government Services’: A content analysis of government working plans. *Information Development*, v. 37, n. 4, p. 633–646, 21 nov. 2021.
- ZUBOFF, Shoshana. *The age of surveillance capitalism. The fight for a human future at the new frontier of power*. New York: PublicAffairs, 2019.

7. Annex

Box 6 – Chinese biggest digital multisided platform companies

Organizations	Baidu	Alibaba	Tencent	JD.com	NetEase
About					
Description	It is a search engine that enables individuals to obtain information and finds what they need.	It enables businesses to transform the way they market, sell, operate, and improve their efficiencies.	It is an internet service portal offering value-added internet, mobile, telecom, and online advertising services.	It is an internet company and online consumer electronics retailer in China.	It is an internet technology company dedicated to providing premium online services.
Website	https://www.baidu.com/	http://alibabagroup.com/	https://www.tencent.com/	http://corporate.jd.com/	https://www.neteasegames.com/
Location	Beijing	Hangzhou	Shenzhen	Beijing	Hangzhou
N. of employees	10001+	10001+	10001+	10001+	10001+
Last Funding type	Series C	Post-IPO Equity	Post-IPO Debt	Post-IPO Debt	Series A
IPO* Status	Public	Public	Public	Public	Public
Stock Symbol	HKG:9888	HKG:9988	HKG:0700	VIE:JD	HKG:9999
Total number of acquisitions	15	34	26	06	03
Details					
Industries	Internet; Search Engine; Social Network	Association; B2B; Information Technology; Shopping	Advertising; Internet; Online Games; Online Portals; Social Media Marketing	e-commerce; Internet; Logistics; Marketplace; Retail; Wholesale	Advertising; Gaming; Mobile; Mobile apps; Music; PC Games; Venture Capital; Wireless
Founded Date	1999	1999	1998	1998	1997
Also known as	百度	阿里巴巴集团, 阿里巴巴集团控股有限公司	腾讯	京东, 京东集团	網易
Legal Name	Baidu, Inc.	Alibaba Group Holding Limited	Tencent Holdings Limited	JD.com, Inc.	NetEase, Inc.
Estimated revenue range	\$1B to \$10B	\$10B+	10B+	\$10B+	\$1B to \$10B
Company type	For Profit	For Profit	For Profit	For Profit	For Profit
Venture arms					
	Baidu Ventures	Alibaba Entrepreneurs Fund	-	Jindong Capital Investment	NetEase Capital

Source: Authors' own. Data sourced from Crunchbase. Note: (*) Initial Public Offer (IPO).

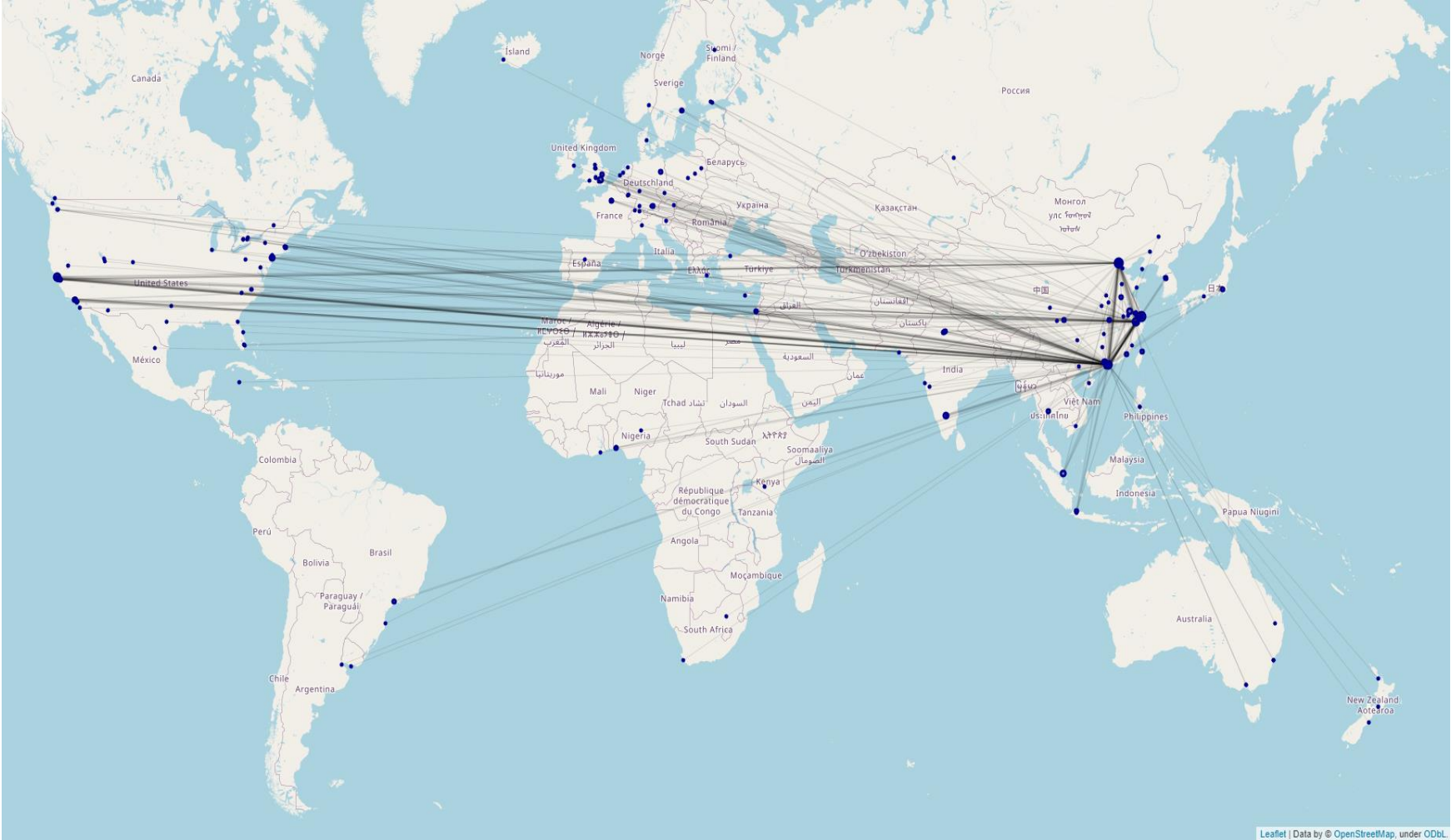


Figure 3 – BAT+JN funding investment flow

Source: Authors' own. Data sourced from Crunchbase.

Box 7 – Top-5 most funded companies by BAT+JN

Companies	Description	Location	Website/App
Baidu			
Velodyne Lidar	It specializes in sensor and software lidar solutions that meet the needs of a wide range of industries.	U.S.	https://velodynelidar.com/
Pixellot	It develops AI-based automatic video and analytics solutions for the semi-professional sports market.	Israel	https://www.pixellot.tv/
Avail Medsystems	It is a medical technology company that develops telemedicine software for the procedure room.	U.S.	https://www.avail.io/
Ripcord	It is a robotics company that combines hardware and software robotics via an integrated SaaS offering.	U.S.	https://www.ripcord.com/
RootPath Genomics	It is a biotechnology company developing a powerful personalized T cell therapy platform that bridges precision medicine.	U.S.	https://www.rootpath.com/
Alibaba			
Lazada Group	It operates an online shopping and selling destination in Southeast Asia.	Singapore	https://www.lazada.com/
One97	It delivers mobile content and commerce services to its customers.	India	https://paytm.com/
Lyft	It designs, markets, and operates a mobile application that matches drivers with passengers who request rides.	U.S.	https://www.lyft.com/
RT-Mart	It is a supermarket that deals in fresh food, snack food, household textiles, hardware appliances, and sporting goods.	Taiwan	https://www.rt-mart.com/
Sun Art Retail Group	It is a retail company that operates a hypermarket and a growing e-commerce business.	Hong Kong	https://www.sunartretail.com/
Tencent			
Kadokawa Corporation	It is a publishing and media firm.	Japan	https://group.kadokawa.co.jp/
Uber	It develops, markets, and operates a ride-sharing mobile application that allows consumers to submit a trip request.	U.S.	https://www.uber.com/
Tesla	It specializes in developing a full range of electric vehicles.	U.S.	https://www.tesla.com/
Flipkart	It operates an online shopping website with a registered customer base of over 100 million.	India	https://www.flipkart.com/
Sea	It is the leading consumer internet company in Southeast Asia and Taiwan.	Singapore	https://www.sea.com/
JD.com			
ESR	It is a pan-Asia logistics real estate developer and operator.	Hong Kong	https://www.esr.com/
Farfetch	It is an online luxury fashion retail platform.	U.K.	https://www.farfetch.com/
Traveloka	It is an online travel aggregator that helps customers choose and book their next travel location.	Indonesia	https://www.traveloka.com/
Tiki	It is an e-commerce company that specializes in the end-to-end supply chain and partnering with brands.	Vietnam	https://tiki.vn/
Pomelo Fashion	It is an international online fashion store for women.	Thailand	https://www.pomelofashion.com/
NetEase			
PalmPay	It is an intuitive digital wallet with account opening, money transfer and bill payments in one. Earn as you spend.	Nigeria	https://www.palmpay.com/
Kepler Interactive	The first global game publisher co-owned and run by developers!	U.K.	https://www.kepler-interactive.com/
NextVR	It is a technology company that captures and delivers live and on-demand virtual reality	U.S.	http://www.nextvr.com/

	experiences.		
Bungie	It is a development studio dedicated to creating community through gaming.	U.S.	https://www.bungie.net/
Theorycraft Games	It operates as an independent game development studio that operates remotely.	U.S.	https://www.theorycraftgames.com/

Source: Authors' own. Data sourced from Crunchbase. All websites were accessed in Feb./2023.