

Crossing Borders and Tech Frontiers: A Comparative Analysis of Venture Capital Investments by US and Chinese Digital Giants in the Platform Economy

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Abstract: The analysis of venture capital (VC) investments plays a crucial role in understanding the dynamics of the platform economy. Big platforms strategically employ VC investments to safeguard their critical resources, acquire new ones, and adapt to evolving resource boundaries resulting from emerging technologies and business models. Existing literature reveals that major platform firms adopt aggressive expansion and venture investment strategies, which contribute to their growing influence and power. In this paper, we take the first step in identifying patterns of VC investments made by big platforms worldwide, focusing on both US and Chinese digital giants. Utilizing Crunchbase data and conducting a descriptive analysis, we have uncovered intriguing general trends in VC investments. Both US and Chinese platform firms exhibit a tendency to invest in companies based in the US, the UK, and India. However, a noteworthy distinction emerges regarding the technology sector of investees. Chinese firms allocate relatively more investments towards AI technologies compared to their US counterparts. This disparity sheds light on the differing investment preferences in the technology domain between the two countries' digital platform firms.

Keywords: Platform Economy; Venture Capital; Internationalization; Crunchbase

Resumo: A análise de investimentos de *venture capital* (VC) desempenha um papel crucial na compreensão das dinâmicas da economia de plataformas. Grandes plataformas empregam estrategicamente investimentos de *venture capital* para proteger seus recursos críticos, adquirir novos recursos e se adaptar às novas fronteiras de recursos resultantes de tecnologias e modelos de negócios emergentes. A literatura existente revela que as principais empresas de plataforma adotam estratégias agressivas de expansão e investimento de risco, o que contribui para sua crescente influência e poder. Neste artigo, damos o primeiro passo na identificação de padrões de investimentos em VC feitos por grandes plataformas em todo o mundo, com foco nas gigantes digitais dos EUA e da China. Utilizando dados da Crunchbase e conduzindo uma análise descritiva, descobrimos tendências gerais intrigantes em investimentos de capital de risco. As empresas de plataforma americanas e chinesas exibem uma tendência de investir em empresas com sede nos EUA, Reino Unido e Índia. No entanto, uma distinção notável surge em relação ao setor de tecnologia das empresas investidas. As empresas chinesas alocam relativamente mais investimentos em tecnologias de IA em comparação com suas contrapartes americanas. Essa disparidade lança luz sobre as diferentes preferências de investimento no domínio da tecnologia entre as empresas de plataforma digital dos dois países.

Palavras-chave: Economia de Plataformas; Venture Capital; Internacionalização; Crunchbase

Código JEL: L86; O33; G34

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1. Introduction

The analysis of venture capital (VC) 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 and Qi 2022). The literature has demonstrated that big platform firms have aggressive expansion and venture investment strategies, which contribute to their increase in power (Li and Qi 2022).

In the case of U.S., studies have revealed that the merger and acquisition (M&A) strategies of GAFAM (Google, Apple, Facebook, Amazon, and Microsoft) are driven by factors such as geographic expansion; the search for new technological capabilities; competitive concerns; and by capital concentration and centralization (Gautier and Lamesch 2021; Parker, Petropoulos, and Van Alstyne 2021; Rikap and Lundvall 2020, 2021). For instance, from 1988 to 2020, 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, and 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, and Teulon 2021). Similarly, Chinese platform firms have aggressive strategies as well (Diegues and Roselino 2021), with strong participation in venture funding of emerging U.S. companies and the deepening of strategic partnerships (Gonzales and Ohara 2019). Evidence shows that Alibaba and Tencent are expanding internationally (Li and Qi 2022) and utilizing cross-investments schemes to facilitate traffic funneling and data sharing (Jia and Kenney 2021).

In an attempt to map the VC investments of Chinese giant platforms, Prates, Chiarini, and Ribeiro (2023), using Crunchbase data, revealed differences in the expansion and internationalization strategies adopted by BAT (Baidu, Alibaba and Tencent), JD.com, and NetEase. The results indicate that both Tencent and Alibaba are more aggressive in their investments compared to the others, and all of them are expanding into various sectors, indicating their aim to establish a comprehensive digital ecosystem.

However, to identify patterns of big platforms' VC investments worldwide it is necessary to look also at the US giant platforms. While there are studies on M&A of US giant platforms (Parker, Petropoulos, and Van Alstyne 2021), as far as we are concerned, there is not a systematic overview of Chinese and US giant platforms' VC investments in a comparative perspective. This approach

can lead to insights to identify patterns of VC investments in the era of the platform capitalism. Therefore, the objective of this paper is to make a preliminary analysis of big platforms' VC investments worldwide.

The structure of the paper is as follows. In section 2, we provide a brief context of the platform economy. In section 3, we highlight the methodology used to identify the companies that receive venture investments from both US and Chinese big platforms, following the method developed by Prates, Chiarini, and Ribeiro (2023). In section 4, we present a concise descriptive analysis of data. Finally, in the last section, paper concludes with some closing remarks.

2. The context of a platform economy

Digital platforms are socio-technically structured virtual spaces where participants interact based on technically framed rules (Dolata and Schrape 2022) and form digitally orchestrated networks with different levels powers (van Dijck, Poell, and Waal 2018). 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 organised places of strategic decision-making and the management of the platforms they own” (Dolata and Schrape 2022, 10).

In addition to the common misconception that confuses platform firms with the digital platforms they control, there is also confusion within the literature that links digital platforms with a novel technology. According to Silva, Bonacelli, and Pacheco (2020), the platform economy rests on three fundamental technological pillars: big data¹, artificial intelligence (AI) systems, and cloud computing. While platform companies indeed leverage these technologies to operate and govern their digital platforms, it is essential to recognize that these technologies are not the platforms themselves.

The global impact of giant platform firms is far-reaching, with both the United States and China holding prominent positions. China's rise as a global competitor challenges the traditional center-periphery divide, and it consistently competes with the U.S. for dominance in crucial digital

¹ Even though big data itself is not a technology, it plays a vital role in the platform economy and is strongly linked to various technologies that support its handling and analysis. These technologies encompass data storage systems, distributed computing frameworks, data processing tools, and data visualization software. Together, these technological components create the essential infrastructure and tools required to effectively manage and leverage big data.

technologies (UNCTAD 2019). In the digital realm, both countries have become crucial centers of influence (Li and Qi 2022). For instance, they jointly hold 75% of all patents related to blockchain technologies, contribute 50% of global spending on the Internet of Things (IoT), and control over 75% of the world market for public cloud computing. Moreover, they collectively represent 90% of the market capitalization value of the world's 70 largest digital platforms (UNCTAD 2019).

The internationalization strategies of major digital platform companies can be interpreted as not only driven by commercial motives but also aimed at absorbing knowledge in the digital sector. Rikap and Lundvall (2021) emphasize the significance of Corporate Innovation Systems centered on the influence of large tech firms. When examining them, we must consider how their business practices aim to bring together various actors involved in generating knowledge in cutting-edge technologies, enabling these tech giants to maintain their monopoly power. Both in China and the United States, these big tech companies are increasingly influencing all aspects of the global data value chain (GVC), ranging from data collection to user-facing platform services, data transmission, storage, analysis, processing, and utilization through artificial algorithms (Andreoni and Roberts 2022).

Andreoni and Roberts (2022) describe the dominance of these massive platforms as a triangular framework encompassing their roles, economic influence, and methods of generating, obtaining, and profiting from value. The significant economic power they wield creates obstacles for countries seeking to develop local capacities, especially when data controlled by these platforms becomes a valuable asset for local businesses to compete with.

In Rikap's (2023) analysis of various AI companies' management practices, the study emphasizes the importance of considering not only the number of AI-related acquisitions and the industries of the acquired firms but also the investments made in AI companies without complete acquisition. Google stands out for its AI-related acquisitions, while Microsoft adopts a different approach by focusing on sectors where it lacks a strong presence, such as Mobile and iOS, and strengthening its position as a provider of tools and platforms for developers (Rikap 2023).

A notable example of Microsoft's strategy is its investment in OpenAI. Instead of acquiring the company outright, Microsoft opted to provide OpenAI with supercomputers after 2019. This move enabled OpenAI to shift its focus from pure research to practical applications in the AI field, leading to significant advancements like ChatGPT. Moreover, Microsoft's additional investments in OpenAI further bolstered the company's progress.

According to Rikap (2023), Microsoft's decision to invest in OpenAI rather than acquire it was a strategic move to ensure that OpenAI's innovations and applications remain accessible even to Microsoft's competitors. By adopting this approach, Microsoft contributes to the broader AI community while solidifying its position as a major player in the AI landscape.

Among the Chinese big platform companies, Tencent and Alibaba stand out for controlling a global digital infrastructure, enabling them to exert power over smaller platforms (Li and Qi 2022). Both companies 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 and Rikap 2022, 08).

In China, the history of Internet companies, to a large extent, relates to the history of the emergence of 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)(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, 68).

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, 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, and Sun 2016).

The VC investments of platforms occurred in a context after the crisis of dot.com bubble of 2000, when a regime change occurred in the formation of new firms (Kenney and Zysman 2019). In this context, emerging platforms found “decreased cost, increased speed, and ease of market entry” due to the advancement of digital economy (Kenney and Zysman 2019). The authors underscore the disruptive effect in incumbent firms caused by the proliferation of startups in various business sectors with new kinds of funding sources growing in size and number. The capital investments in this context allow emerging platforms to beat incumbent in price and service, in a way that “new entrants with access to massive amounts of capital can survive losses for a sufficiently long period to displace existing firms and, thereby, transform earlier industrial ecosystems” (Kenney and Zysman 2019).

3. Methodology

The methodology employed in this paper aligns with the approach proposed by Prates, Chiarini, and Ribeiro (2023). In the following subsections, we outline the database used and explain the process of identifying the investees, as well as how we handled their sectors and technologies. It is essential to acknowledge that while the current method has been effective, there remains significant potential for further enhancements and refinements in the proposed approach.

3.1 Database

The data utilized for this study was obtained from Crunchbase, a commercial database that aggregates information from over 2 million registered entities. Established in 2007, Crunchbase has expanded its scope over the years. However, its coverage is not precisely defined and may vary across countries and sectors (Dalle, Besten, and Menoni 2017). The available information on companies includes details such as their size, location, primary role (firm, group, investor), status (active or closed), type (for-profit or non-profit), founding date, industry group, estimated revenue range, and a brief description.

Crunchbase also provides extensive data on risk financing, with historical information that predates the database's creation by many years, and its coverage has significantly increased over time (Dalle, Besten, and Menoni 2017). The platform organizes data on firms' funding rounds, encompassing over 526 thousand events. It includes the total number of investors (over 238 thousand, with 33.6% based in the US and 5.9% in China, as shown in Table 1), their names, and

identifies the lead investors in each round. Additionally, the database indicates the type of investment (VC, business angel, private equity, etc.) and the amount of capital raised. Crunchbase is widely recognized as one of the primary sources for venture capital data (Bellavitis, Fisch, and McNaughton 2022).

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 and the Caribbean: 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.

It is important to note that the regional representation on Crunchbase is not uniform. The dataset appears to be more effective in identifying US and Canadian firms, which together account for over 1 million registered companies, approximately 50% of the entire Crunchbase dataset. The European Union (including the UK) has around 380 thousand registered companies, and the Asia-Pacific region (including China, India, Japan, and South Korea) has approximately 300 thousand companies. Finally, it is worth mentioning that Crunchbase obtains its data from three main sources: *i*) investor network: more than 4,000 global investment firms submit monthly portfolio updates; *ii*) active community contributors: executives, entrepreneurs, and investors actively contribute to company profile pages, ensuring continuous growth and improvement of the dataset; and, *iii*) AI and machine learning: Algorithms are employed to validate data accuracy, identify anomalies, and alert the Crunchbase data science team regarding potential conflicts in the data.

Once the data is acquired, Crunchbase data analysts perform manual validation and curation, analyzing crucial connections within the data to develop algorithms and provide valuable insights. In other words, Crunchbase functions as a partially crowd-sourced database, incorporating mechanisms to verify data accuracy through the application of machine learning algorithms, detecting inconsistencies, and notifying their data scientists of any discrepancies that may arise (Ferrati and Muffatto 2020).

3.2 Screening the firms

We perceive digital multisided platform companies as conventional capitalist organizations. They are not identical to their digital platforms but rather serve as organized hubs for strategic decision-making and platform management (Dolata and Schrape 2022). In practical terms, a platform company functions as a traditional corporation, much like firms from a century ago. However, the organizational innovation lies in the firm's control over a digital service space.

Keeping this in mind, our first step involved identifying the largest US and Chinese digital multisided platform companies listed in Fortune's Digital 100 compiled by Acs *et al.* (2021) (Table 2). Additionally, we considered their respective corporate venture investment arms for those platform firms with available information on Crunchbase. We included firms' venture investment arms as they aim “to maintain and strengthen the power of big tech, but it is reinforced with financialized aims, that is the pursuit of financial gains” (Li and Qi 2022, 19).

Table 2 – Biggest U.S. and Chinese digital multisided platform firms and their venture arms

Company	Market Value 2023 (USD bi) ^{1,2}	Profit 2023 (USD bi) ^{1,2}	Venture arms	Country
Apple	2,746.21	94.32	-	USA
Microsoft	2,309.84	69.02	M12	USA
Alphabet (Google)	1,340.53	58.59	Google Ventures	USA
Amazon	1,084.06	4.29	Amazon Smbhav Venture Fund	USA
Meta Platforms (Facebook)	599.82	21.44	Meta Ventures	USA
Tencent Holdings	227.01	27.26	-	CHN
Alibaba	216.59	4.46	Alibaba Entrepreneurs Fund	CHN
Booking Holdings	94.89	4.02	-	USA
Paypal	84.18	2.42	PayPal Ventures	USA
Fiserv	74.55	2.42	-	USA
Activision Blizzard	59.75	1.86	-	USA
NetEase	56.68	2.93	NetEase Capital	CHN
JD.com	56.26	1.49	Jindong Capital Investment	CHN
Baidu	42.00	1.09	Baidu Ventures	CHN
Fidelity National Information (FIS)	33.03	-16.7	FIS Impact Ventures	USA
eBay	24.39	0.63	eBay Ventures	USA

Source: Authors' own. (1) Data sourced from Forbes “The Global 2000”. (2) Data sourced on 07/25/23

Using these platform firms as 'seed nodes,' we were able to gather other companies connected through investment relationships within one degree of separation. From the 14 thousand Chinese investors (Table 1), we considered only the five platform firms present in Table 2. These firms had made investments in 1,018 other companies, both domestically and abroad. Similarly, from the 80 thousand US investors (Table 1), we considered only the 11 platform firms present in Table 2. These firms had made investments in 1,251 companies, as presented in section 4.

3.3 Data adjustments: “the industry-technology puzzle”

One aspect of particular interest in this study revolves around the diversification strategies pursued by large platform firms. Specifically, the study seeks to investigate whether these firms transcend the boundaries of traditional industrial sectors. However, it is worth noting that Crunchbase does not adhere to the nomenclature of economic activities commonly employed by governmental statistical offices, such as NACE (in the European context) or NAICS (in the case of the US). Instead, Crunchbase organizes company data based on industry groups². According to Crunchbase, industry groups represent broader subjects that encompass multiple industries, whereas industries are more specific market segments. Notably, company profiles on Crunchbase can be associated with multiple industries and industry groups, typically ranging from 3 to 5 groups. This noteworthy characteristic of Crunchbase reflects the significant changes in the nature of industries and markets since the 2000s, where traditional sectoral boundaries have eroded due to technological advancements (Jacobides and Lianos 2021).

One limitation of Crunchbase's industry groups is that it does not effectively distinguish between "technology" and "industry". This can result in misleading classifications and potentially lead to inaccurate conclusions. For instance, consider the case of Kuaishou³, a Chinese firm that operates an online video platform where users can broadcast their daily activities and has received funding from Tencent. According to Crunchbase, Kuaishou is classified under various industry groups, including AI, mobile apps, photo sharing, social network, and video streaming. This lack of differentiation creates ambiguity and hampers the precision of categorization.

Similarly, another example is Gojek⁴, an Indonesian company based in Jakarta that operates a digital platform offering a range of services such as payments, food delivery, transportation, and logistics. Gojek has received investments from Tencent in some of its funding rounds. However, Crunchbase assigns Gojek to six different industry groups: consumer applications, e-commerce, food delivery, logistics, payments, and transportation. Such a broad categorization fails to provide precise distinctions and can potentially lead to erroneous interpretations (Savin, Chukavina, and Pushkarev 2022).

² 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.

³ <https://www.kuaishou.com/>, accessed in Feb./2023.

⁴ <https://www.gojek.io/>, accessed in Feb./2023

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, and Pushkarev 2022, 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 companies' descriptions and classify them according to these topics" (Savin, Chukavina, and Pushkarev 2022, 06). Although "in comparison to the Crunchbase classification, STM [structural topic modeling] approach produces topics that are better distinguishable and more concrete" (Savin, Chukavina, and Pushkarev 2022, 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.

Given that the aim of this paper is not to propose a new classification system for Crunchbase industries, we have opted to differentiate "technologies" from their respective application areas. To illustrate this approach, we have identified a range of technologies associated with the fields of science and engineering. These technologies include AI, cloud computing, data science technologies, software, hardware, augmented reality technologies, quantum computing, and advanced materials. By separating the technologies from their specific application domains, we can maintain a clear distinction between the underlying technological advancements and the industries in which they are employed.

4. Results and dicussion

4.1.General findings

The global investments of major digital platform companies are extensively distributed, as depicted in Figure 1 and Figure 2. Analyzing the data present in Table 3, we find that 75% of the funding invested by US platform companies in VC remains within the domestic market. The UK also attracts a notable portion of US investments at 5.5%. In Asia, India (4%) and Singapore (0.8%) stand out as the primary recipients of these investments, while China accounts for only 0.7%, ranking seventh in the list.

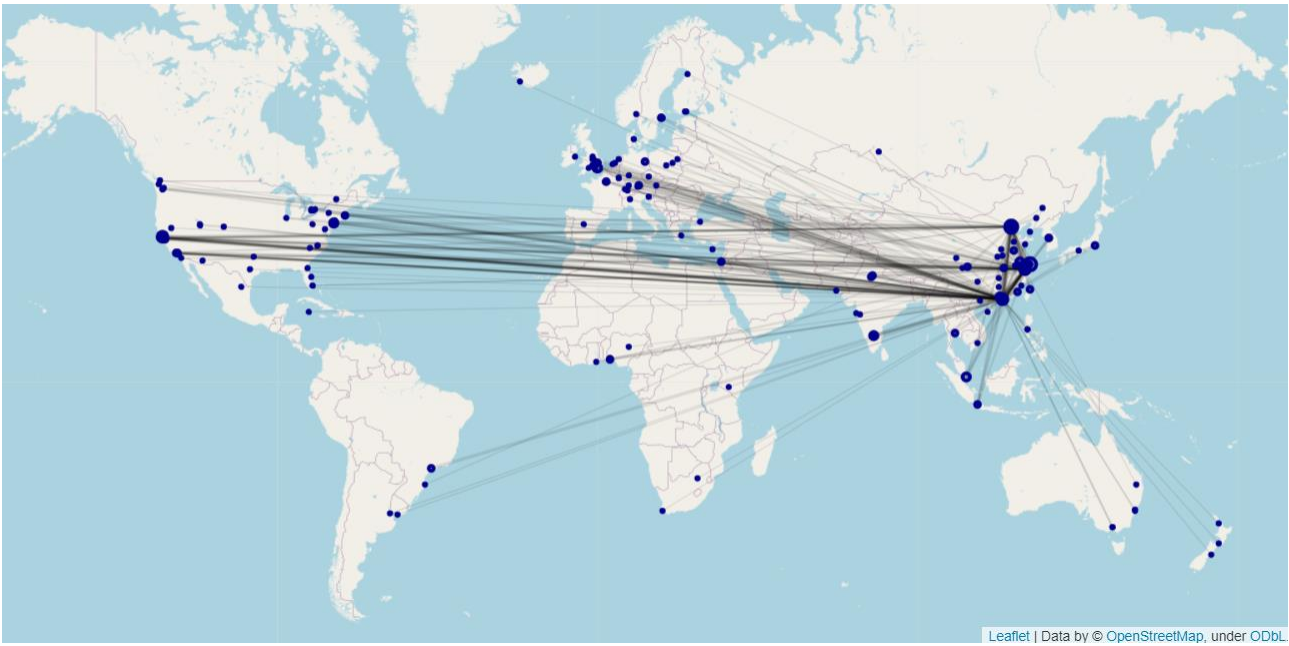


Figure 1 - Chinese digital platforms' funding investment flow

Source: Authors' own. Data sourced from Crunchbase.

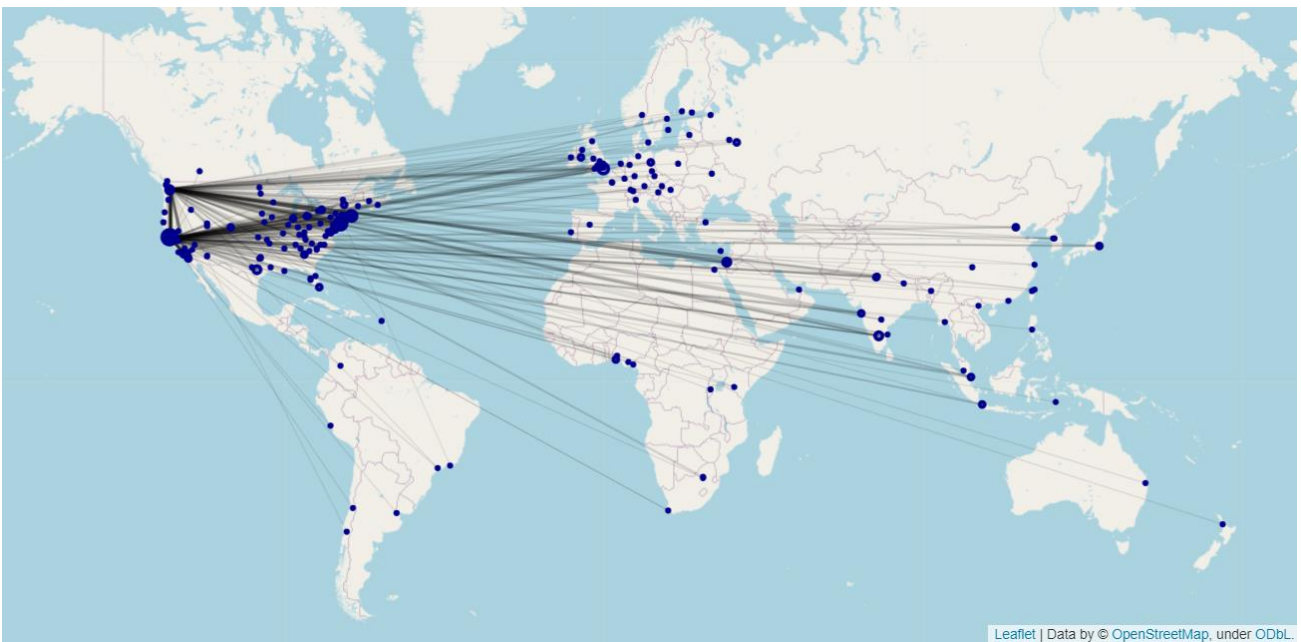


Figure 2 - US digital platforms' funding investment flow

Source: Authors' own. Data sourced from Crunchbase.

A closer look at China's funding investments in VC reveals that 60% is allocated domestically, with 15.4% directed towards US-based companies. Among Asian countries, Singapore (1.4%) and Indonesia (1.2%) emerge as the main beneficiaries of Chinese investments.

Furthermore, an intriguing observation is the asymmetry in VC investments between Chinese and US digital platforms. While 15.4% of Chinese digital platforms' VC investments are directed towards the US, the reverse is not true for US digital platforms investing in China, with the figure

being less than 1% of the total. This discrepancy highlights a significant difference in investment strategies and priorities between the Chinese and US digital platform companies.

Despite this disparity, a common pattern emerges in the investment approach of both Chinese and US giant digital platforms. Both regions demonstrate a tendency to invest in companies based in the US, the UK, and India. This trend suggests that these particular markets hold significant appeal and potential for growth and innovation, attracting attention from major players in the tech industry from both China and the US.

Table 1 – Investees by country of origin

Chinese VC			U.S. VC		
	N.	%		N.	%
China	611	60.0	United States	938	75.0
United States	157	15.4	United Kingdom	69	5.5
United Kingdom	32	3.1	India	50	4.0
India	30	2.9	Canada	27	2.2
Hong Kong	21	2.1	Israel	20	1.6
Singapore	14	1.4	Singapore	10	0.8
Germany	12	1.2	China	9	0.7
Indonesia	12	1.2	Germany	9	0.7
Israel	10	1.0	Russia	9	0.7
Canada	8	0.8	Ireland	8	0.6
Others	111	10.9	Others	101	8.1
Total	1,108	100	Total	1,250	100

Source: Authors' own. Data sourced from Crunchbase

To gain deeper insights into this trend, it is imperative to delve into the sectors of companies that receive VC investments from both Chinese and US digital platforms. The distribution by sector demonstrates that the selected big tech companies invest in a wide range of sectors, spanning from "science and engineering" and "biotechnology" to "gaming" and "education." This approach aligns with a common strategy among platform firms identified by Zuboff (2019), which aims to establish a digital ecosystem capable of locking in users, generating valuable user data, and converting it into valuable assets for the platform companies (Li and Qi 2022).

Specifically, in the case of Chinese big techs, the majority of venture investments are focused on "science and engineering" fields, accounting for 25% of the investments, followed by "commerce and shopping" (10%) and "media and entertainment" (10%) (Figure 3). On the other hand, their US counterparts show similar preferences for "science and engineering," which represents 29% of their invested companies, and "commerce and shopping" with 8% (Figure 3).

This data highlights the alignment of investment strategies between Chinese and US digital platforms, both seeking opportunities in sectors that can contribute to the creation of thriving digital ecosystems. Such investment patterns reflect their interest in securing a strong user base, harnessing valuable data, and fostering innovation within these sectors to drive sustainable growth. In terms of the technologies developed or embraced by the investees, a notable distinction emerges

between the US and Chinese cases. In the US, the primary focus lies in "Software," which constitutes 49% of the total invested firms, followed by "AI" at 19% and "ICT in general" at 16%. Comparatively, the Chinese case shares similar sectors as the main targets, but the percentages vary – "Software" accounts for 40% of the total firms, "AI" at 21%, and "ICT in general" at a higher 24% (Figure 4).

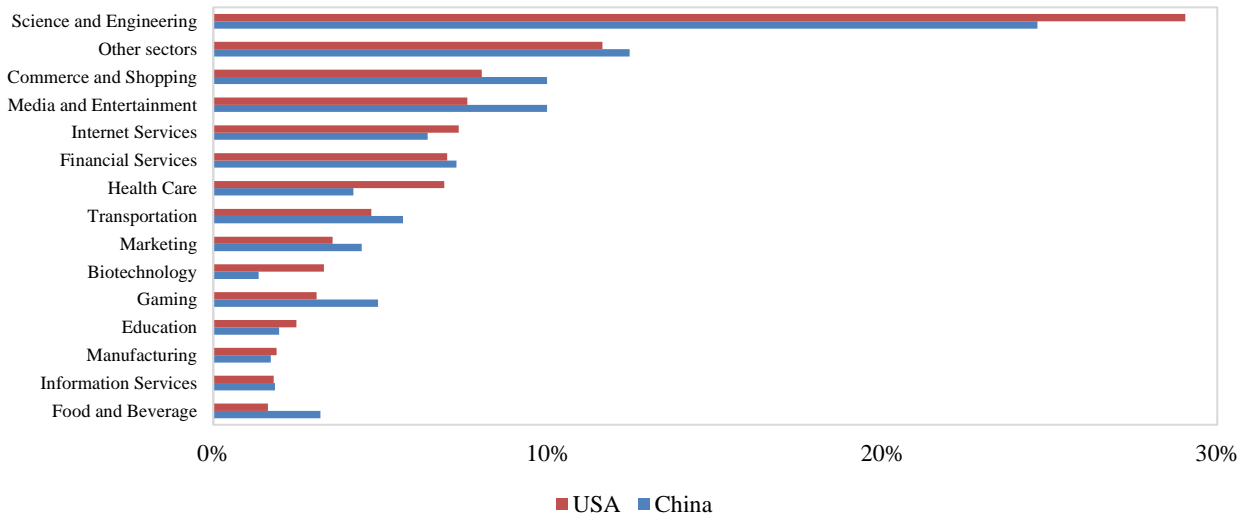


Figure 3 - Investees by sector group

Source: Authors' own. Data sourced from Crunchbase. Note: 40% of Chinese investees and 97% of US investees provide information regarding their sector group. As presented in section 3.3, more than one sector group can be applied to the same company, therefore, there may be double counting.

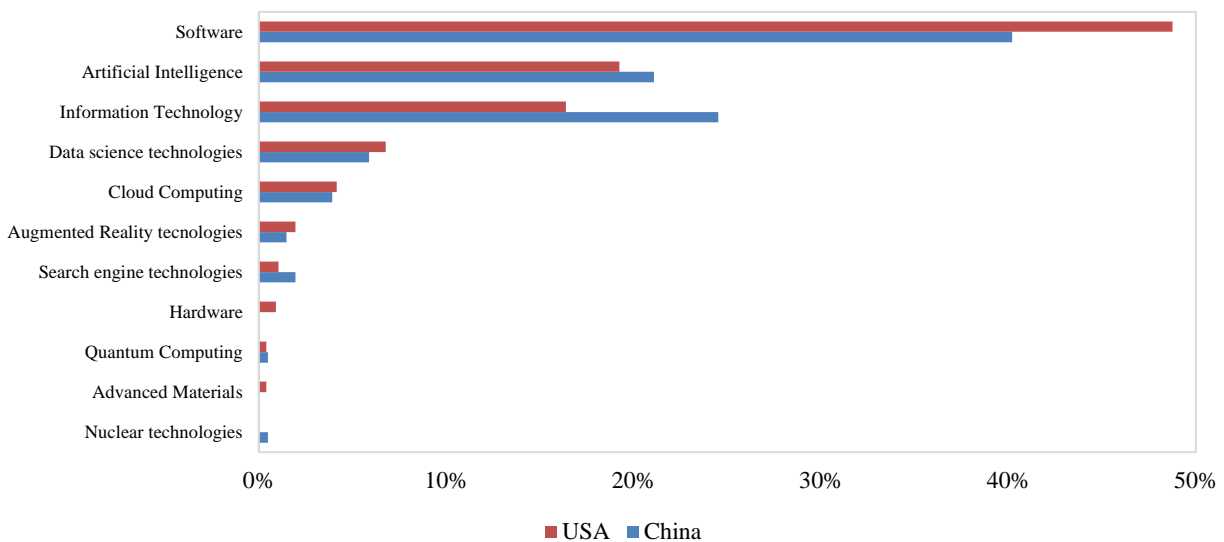


Figure 4 - Investees by technology group

Source: Authors' own. Data sourced from Crunchbase. Note: 14% of Chinese investees and 43% of US investees provide information regarding their technology group. As presented in section 3.3, more than one technology group can be applied to the same company, therefore, there may be double counting.

Our analysis underscores the intense competition between US and Chinese giant platforms in the global market, corroborating the findings of Rikap and Lundvall (2021). These have dispersed their VC investments worldwide, with a noticeable concentration in countries belonging to the

Global North, such as the US and the UK. However, it is noteworthy that in the Global South, both India and Singapore emerge as significant markets for both US and Chinese giant platforms as it can be seen from Figure 1 and Figure 2.

The industrial profile of these investments reveals a clear inclination towards the "science and engineering" industry, as well as technologies like "Software", "AI", and "ICT". This trend highlights the current significance of data-driven business models to venture capitalists (Prado and Bauer 2022). The VC industry has demonstrated its agility and natural alignment with the rapidly evolving technological landscape by investing in disruptive technologies and capitalizing on market disruptions (Khan et al. 2021).

When making investment decisions in start-ups, the focus primarily lies in evaluating the volume and concentration of data possessed by the start-up and its criticality to the business model. Start-ups that effectively gather data and establish feedback loops, where consumers contribute data that enhances the service and attracts more customers, are likely to attract increased funding (Prado and Bauer 2022). This emphasis on data-driven models reflects the growing importance of data as a valuable asset in shaping the success of start-ups and attracting investment interest in the dynamic VC landscape.

Overall, both the US and China are strategically investing in technologies that hold immense potential for shaping the future digital landscape, particularly in the realm of AI (Rikap and Lundvall 2021). These investments indicate the determination of both countries to maintain their positions as leaders in the global tech industry, with their approach focusing on the internationalization of their digital endeavors.

4.2. Particular findings

The data clearly shows that the selected big tech companies do not adopt a uniform VC investment strategy. By analyzing the number of investees (Figure 5), we observe that Alphabet (Google) takes the lead with an aggressive VC approach, having made 638 investments. Tencent closely follows with 530 investments, followed by Microsoft with 292 and Alibaba with 220 investments. On the other hand, some digital giants have invested in fewer than one hundred companies, such as Amazon, Meta, and Apple.

When considering the GAFAM group, only Google (Alphabet) and Microsoft stand out with a

substantial investment footprint, as measured by the number of investees. In contrast, the other members of GAFAM have more conservative investment approaches. Turning our attention to the Chinese giants BAT, all of them maintain relatively significant investment profiles. Among them, Baidu has the fewest investments, totaling 147.

As we have observed, the companies under analysis have adopted diverse strategies for internationalization and technological acquisition, reflecting varying levels of VC investments and distinct priorities. In particular, when examining the two main US investors, namely Google and Microsoft, Rikap (2023) identified two different strategies aimed at dominating the AI industry. Google stands out in this sector with a strategy centered on internal research and collaborations with universities, though commercial outcomes remain somewhat uncertain. On the other hand, Microsoft plays a prominent geopolitical role by fostering connections between US and Chinese actors in a strategy dubbed "Frenemies" (Rikap 2023).

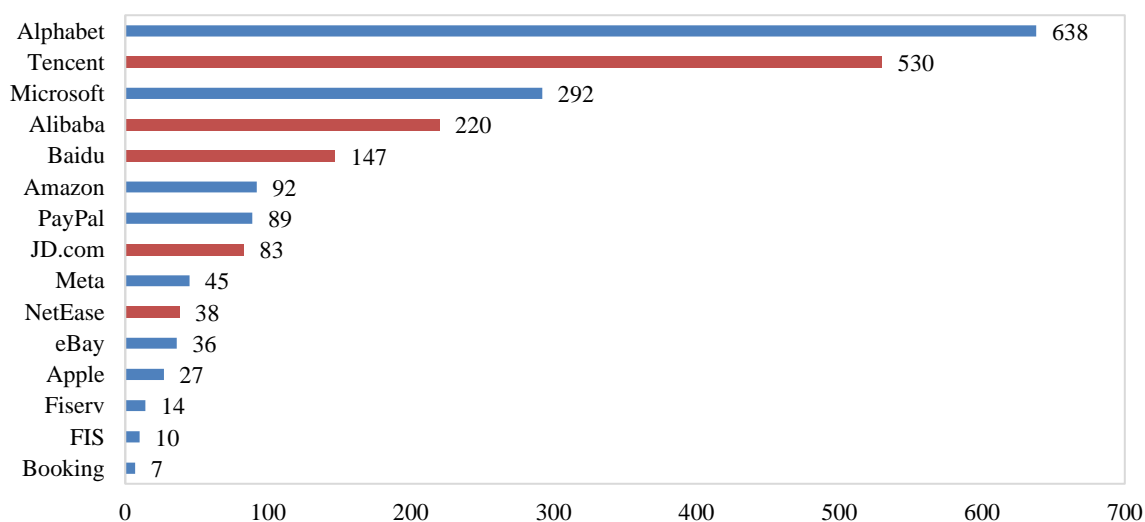


Figure 5 - Investees by company

Source: Authors' own. Data sourced from Crunchbase.

Tencent is the most globalized firm among the Chinese giant platforms. 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, and 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, and Zysman 2018). This huge traffic of data empowered Tencent, so it could provide cloud solutions to other Chinese firms operating globally (Jia, Kenney, and 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 and Kenney 2021), i.e., an infrastructure (Plantin and de Seta 2019), and it is also Tencent's primary source of big data (Lundvall and 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 and Kenney 2021).

Alibaba has e-commerce globalization as its top priority (Jia, Kenney, and 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 and 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, 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 and Gereffi 2018, 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 and Kenney 2021).

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 selected digital giants we can find significant 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 and Qi 2022, 13).

5. Final comments

This paper presented preliminary figures on big platforms' venture capital (VC) investments worldwide, but it does have some important limitations. One significant constraint arises from the structure of Crunchbase's data, which prevents us from identifying the specific amount of money each digital platform company invests in other firms worldwide. Instead, the database only

provides aggregate values per investee.

Consequently, in our analysis, we relied on the number of companies that received any amount of money from these big platforms, rather than the exact monetary figures. While acknowledging that knowing the exact VC amount received by Firm A from Platform B is significantly different from just knowing that Firm A received VC from Platform B, we believe that even without precise monetary data, our analysis on the number of investees can still provide valuable and interesting insights.

Having considered that aspect, we have indeed identified some intriguing general patterns in the VC investments made by digital platform firms from both the US and China. Firstly, both countries' platform firms tend to invest in companies based in the US, the UK, and India. However, it is noteworthy that while Chinese platform firms exhibit a tendency to invest in the US, the reverse pattern is not observed, as US platform firms do not tend to invest in China.

Another interesting observation pertains to the industrial and technology sectors of the investees. For both US and Chinese platform firms, the focus of their VC investments lies in the "science and engineering" industrial sector. However, when it comes to AI technology sectors, Chinese platform firms invest relatively more in AI investees compared to their US counterparts (21% and 19% respectively). This disparity provides valuable insights into the differing investment strategies and priorities of the digital platform firms from the two countries in the realm of AI technologies.

These figures underscore the intense competition between the US and China giant platforms as they vie for dominance in the field of AI systems (Rikap and Lundvall 2021). Remarkably, China's strategy of "China's globalizing Internet," which involves the entanglement of the Chinese Internet with transnational capital, showcases a strong drive towards globalization. This approach is supported by crucial technologies such as AI, big data, and cloud computing, all facilitated by the advancements in 5G networks (Hong and Harwit 2020). Many of these technologies are recognized as leading elements at the forefront of the digital economy (UNCTAD 2019). Some even represent expectations of transformative technological advancements that remain largely uncertain, as seen in the case of quantum computing.

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Annex

Table 2 – Investees by country of origin and by big tech

	Alibaba	Alphabet	Amazon	Apple	Baidu	Booking	eBay	FIS	Fiserv	JD.com	Meta	Microsoft	NetEase	PayPal	Tencent	Total
Argentina														1	1	2
Australia												1	1		5	7
Austria		1		1								1			1	4
Brazil					1	1						1		1	6	10
Canada		4	4								5	12	1	2	7	35
Cayman Islands															1	1
Chile												1		1		2
China	146	2	1	2	115	2	1			69		1	11		270	620
Colombia														1		1
Cyprus												1			1	2
Czech Republic		1	1												1	3
Denmark												2		1	1	4
Egypt			1											1		2
Finland	2				1							2			2	7
France			1							1	1		1		6	10
Germany	1	1	1							1		4		3	10	21
Ghana															1	1
Greece															1	1
Hong Kong	15				1					2		1			3	22
Hungary												1				1
Iceland															1	1
India	8	3	18	1			5				9	11		3	22	80
Indonesia	2						1			2	2	1		1	8	17
Ireland		2										2		4	1	9
Israel	5	2	1		2							15		2	3	30
Italy							1					1			2	4
Japan	2						1				1	1		3	6	14
Kenya												1		1	1	3
Latvia			1													1
Luxembourg							1						1		1	3
Malaysia												1				1
Mexico															1	1
Myanmar											1					1
New Zealand												1			3	4
Nigeria	1										3	4	1	1	4	14
Norway							1					1	1		1	4
Pakistan	1															1
Peru											1					1
Philippines														1	2	3
Poland												1	2		1	4
Portugal		1										1				2
Russian Federation	1											9				10
Rwanda												1				1
Saint Kitts and Nevis									1							1
Singapore	3					1	1			2	3	3	1	2	8	24
Slovenia															1	1
South Africa		1										3		2	2	8
South Korea	1					1			1			2		1	6	12
Spain												1			1	2
Sweden		1										1	1	2	4	9
Switzerland	2	2														4
Taiwan	5			1	1					1		1				9
Thailand										1					3	4
The Netherlands		1										1			3	5
Turkey	1		1													2
Ukraine			1													1
United Arab Emirates														1		1
United Kingdom	1	30	4	1			1	2		1	1	23	5	7	25	101
United States	20	579	56	21	26	1	23	8	11		17	177	12	45	99	1,095
Uruguay															1	1
Vietnam	1									1				1	1	4
No country available	2	7	1		1				1	2	1	1		1	2	19
Total	220	638	92	27	147	7	36	10	14	83	45	292	38	89	530	2,268

Source: Authors' own. Data sourced from Crunchbase.