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The Entry of Big Techs into Financial Services - Implications, Risks and Regulatory Perspectives

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1. Introduction

In the last decade, the intersection of technology and finance has given rise to a transformative era in the financial services industry, marked by the entry of *Big Tech* companies. Tech giants such as the GAMAM (Google, Amazon, Meta, Apple, Microsoft) and the BAT (Baidu, Alibaba, Tencent), were able to leverage their large brand recognition, the vast consumer base, the deep technological expertise, and the network effects deriving from their core businesses to offer innovative services in one of the toughest markets. Providing a vast portfolio of financial solutions like digital payments systems, loans and other credits, wealth management and insurance, *Big Techs'* entrance in finance could be seen for some extent as beneficial, but at the same time it can be evaluated as a threatening force, both from financial incumbents and consumers.

The goal of this thesis is to observe and analyze what allowed these companies to provide financial solutions and which are the main effects of this crucial transition. Particularly, in Chapter 2 the paper presents a general description of the main *Big Techs* outlining the principal characteristics they share. Subsequently, in Chapter 3 it is analyzed what allowed these companies to enter the financial services market and which products they are offering to their consumers, exploring some examples among the largest players. Later in the paper, Chapter 4 reviews the existing literature to examine both the benefits and challenges associated with competition and financial inclusivity. Finally, the last Chapter faces the regulatory issue, trying to provide some practical approaches to limit the potential risks that could be originated by this pivotal shift.

2. The *Big Tech* Market

Technology companies that have dominated the market over the last two decades, such as Google, Amazon, Meta, Apple, and Microsoft (collectively referred as GAMAM), are commonly defined as *Big Techs*. These companies are characterized by enormous market capitalizations and omnipresence in daily life, due to their unparalleled ability to collect, process, and monetize massive amounts of data. These technology giants, because their technological prowess have redefined industries, set new standards for user experience, and have an undeniable impact on the global economy and society at large.

From 2018 to 2022, the GAMAM have registered an average revenue growth rate of 92% and in 2022 they have combined for $1.502 trillion of revenues (Statista, 2023[1]). In terms of revenues, the largest company among the 'Big 5' is Amazon, with $513.98 billion in 2022. Regarding market capitalization, Apple stands out as the undeniable leader with a valuation of $2.8 trillion in 2023 (Forbes, 2023), making it the largest company globally by market cap. In addition, Apple, Google, Microsoft, and Amazon, are also the first four companies with the highest brand value (Figure 2), proving outstanding financial performances combined with deep trust from consumers and investors.

Figure 1 - Largest Companies by Market Cap ($tn) Source: Companiesmarketcap

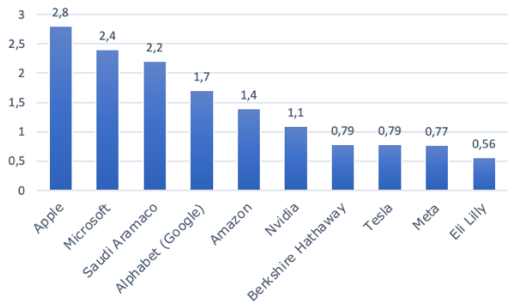
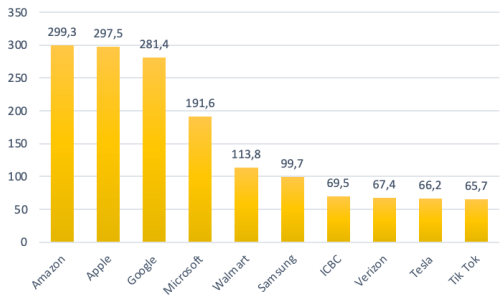


Figure 2 – Companies with the highest Brand Value ($bn) in 2023. Source: Visual Capitalist



[1] Statista, 2023. 'Statistics report about the Big Five tech companies Google, Amazon, Meta, Apple, and Microsoft (GAMAM)'.

Another significant sign of *Big Techs'* supremacy in the market is the amount of value they account for in two of the main financial market's indices. Together with Nvidia and Tesla, the GAMAM conglomerate make up for 29% of the market value of the S&P 500 and 61% of the NASDAQ 100 (The Economist, 2023).

The *Big Techs* initially entered the market providing a range of innovative and disruptive IT solutions, such us search engines (Google), online marketplaces (Amazon), social media platforms (Meta), and cutting-edge computers and cellphones (Apple and Microsoft). However, over the years, these tech giants have evolved beyond their core offerings. Leveraging strategic acquisitions and pioneering product developments, they've diversified their portfolios, morphing into multifaceted conglomerates with a presence in a wide range of sectors and industries.

Google has evolved implementing to its core business cloud computing services, advertising platforms, operating systems, hardware devices, and numerous other digital products and solutions. It has also acquired YouTube in 2006, the second most popular website in the world, second only to Google.com (Statista, 2023). Amazon, which started as online bookshop, has now become the biggest e-commerce on the market (Statista, 2023[2]), a provider of cloud services (AWS), a streaming platform (Prime Video) and much more. Meta, formerly known as Facebook – also name of the famous social media platform- throughout its life acquired major communication and social media companies like WhatsApp and Instagram. Apple, starting with its innovative computer design, now governs the smartphone market, enlarged its product line with a vast number of products such as headphones and smartwatches and developed different services such as AppleTV+ and AppleMusic. Lastly, Microsoft, beginning with Windows OS,

[2] Statista, 2023. 'Market cap of leading large cap e-commerce companies worldwide as of June 2023'.

has expanded to cloud services, gaming, and even professional networking with its acquisition of LinkedIn.

While the GAMAM and most of the *Big Techs* are U.S.-based companies, another conglomerate of tech companies that captured significant power in the market, especially in Asia, are Chinese. We are talking about the tech giants Baidu, Alibaba and Tencent (collectively referred as BAT). Baidu specializes in offering internet search services, online marketing solutions and online advertising services. Last year recorded revenues of $19.3 billion (Forbes, 2023). Alibaba specializes in offering online and mobile platforms for retail and wholesale commerce. Its operations span several key segments: core commerce, cloud computing, digital media and entertainment, along with innovation initiatives and other ventures. In 2022 it registered revenues of $129.8 billion (Forbes, 2023). To complete the trio there is Tencent, an investment firm that in 2022 generated revenues of $86.9 billion offering value-added and online advertising services. It operates mainly in three segments: value-added services, which covers online and mobile games and applications; online advertising, focused on both display and performance-based ads; and others, which includes activities like trademark licensing and software services (Forbes, 2023). As of September 2023, the BAT are the three largest tech companies in China and together account for a market capitalization of around $700 billion[3].

Over the last few years, firms from the GAMAM, the BAT and many others, decided to enter the finance sector. They provided innovative financial services that not only have reshaped the way households manage their finances but also revolutionized the approach businesses take towards

[3] Values obtained on the URL: https://companiesmarketcap.com/

various financial instruments. This shift marks a transformative moment in the relationship between technology and finance.

3. Financialization of *Big Techs*

After the Great Financial Crisis of 2008, the traditional banking sector lost trust from their customers. In a survey run five years after, 71% of household believed that banks didn't learn their lesson (The Guardian, 2012) and another survey run in 2015 by the Edelman Trust Barometer reconfirmed a very similar evidence (De Cremer, 2015). At the same time, the digital disruption era with the rise of smartphones and mobile technology was changing how people accessed and managed their finances. *Big Techs* saw this general moment of uncertainty and transition as an opportunity and following the footprints of *FinTech* companies decided to provide financial services to the market, becoming key players in the new 'digital finance'. They were able to offer a variety of services, including payment systems, lines of credit, checking and savings accounts, insurance, and asset management.

Big Techs boast of the largest customer base and brand recognition in the global market. This dominant position has allowed them to obtain a massive amount of data, coupled with priceless trust from their users. Applying these two crucial factors with deep-rooted expertise and with the disruption of machine learning and artificial intelligence, these companies obtained a rapid success in one of the least accessible industries.

What made these companies unique and not just bigger *FinTech* businesses, is the value they gain from their core businesses. Most of the *Big Techs* provide social media platforms or e-commerce services and, with the information they collect, they can customize offerings based on customer preferences (ESMA, 2019). On the other side, *FinTech* companies are usually innovative startups that completely focus on providing financial

services more efficiently, with the use of digital technologies and big data (Stulz, 2019). PayPal, Robinhood, Revolut, and Visa are just few of the many *FinTech* startups that succeeded in gaining significant market shares in the financial services industry (Statista, 2023[4]).

In the subsequent sections of this chapter is going to be presented an overview of the main financial instruments offered by the *Big Techs*, in particular digital payments, lending options, wealth management services and insurance.

3.1. A New Financial Landscape

Financial services are still a small portion of *Big Techs'* revenues. According to the head of innovation and the digital economy at the Bank for International Settlements, in 2019 only 11%[5] of *Big Techs'* revenues came from financial services (Gaunt, 2019). Digital Payments, financial loans and other credits, wealth management and insurance are the four major areas of focus in which *Big Techs* were able to create demand for their services and competitions for banks (FSB, 2019).

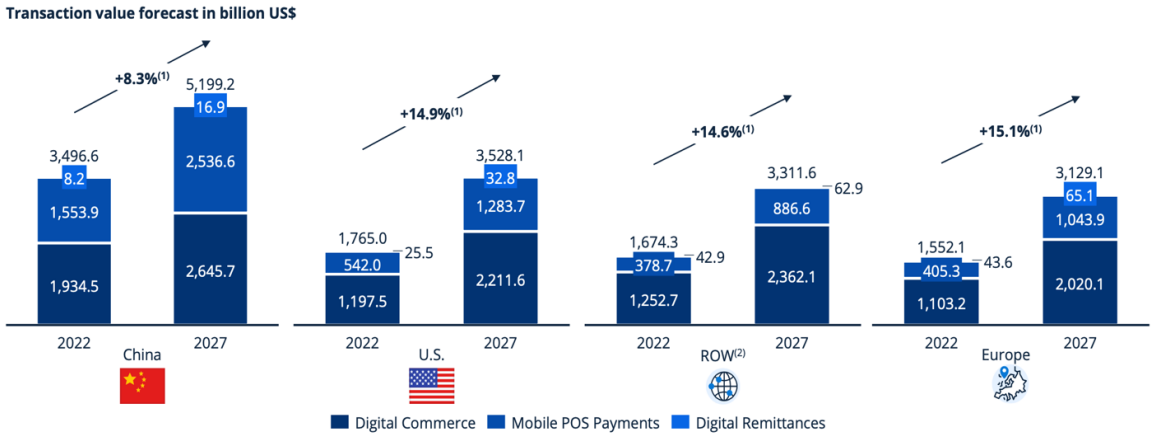
i) Digital Payments

The digital payments sector consists in the exchange of value through transactions between two payment accounts, using digital devices or channels. These transactions include payments via internet (digital commerce), payments using mobile apps at point of sale (POS), but also cross-border money transfers (digital remittances). China topped the market in 2022 with a total transaction value of $3.49 trillion, the U.S. took second place with $1.76 trillion. Europe, mainly represented by the UK and Germany, has registered total transaction value of $1.55 trillion. The 'old

[4] Statista, 2023. 'Top 100 companies: FinTech'
[5] Data is difficult to collect since companies do not disclose clearly the revenues generated from the financial subsidiaries, therefore it was not possible to provide an up-to-date estimation on this value.

continent' is though expected to have the highest compound annual growth rate (CAGR) of 15.1%, reaching a total transaction volume of $3.13 trillion by 2027 (*Figure 3*). Overall, the global volume of digital payments reached $8.48 billion in 2022 and it is expected to grow at CAGR of 16.3% from 2017 to 2027. Last year the transactions were divided as follow: 65% in digital commerce, 34% in mobile pos payments, and 1% in the digital remittances (Statista, 2023[6]).

Figure 3 - Digital Payments market value per region. Source: Statista



Alibaba launched Alipay in 2004, a digital payment platform born to ensure consumers when buying on the Alibaba e-store, as they were skeptic about sending money directly from their bank accounts. To give the definitive boost to the new Chinese platform was the launch of the digital wallet in 2008, adding 20 millions of new users to the platform only in the first two months of 2009 (CGAP, 2019). Today Alipay is the largest digital payment processor in the world, with 1.3 billion of users (2020) and revenues of $7 billion (2019). Alibaba is only one of the many tech companies that implemented digital payments systems to their supply of services.

[6] Statista, 2023. 'Digital Payments Report'

Apple Pay was launched by Apple in 2014. Apple Pay is a digital wallet that allows consumers to complete purchases in very few and simple steps, both online and at point of sale. In 2020, an estimation published by Statista[7] attributed to Apple Pay 507 million of users, with $988 million of revenues and projected $4 billion at the end of 2023. This digital wallet is available in the big majority of countries in Asia, Europe, Oceania, and the America, but it does not have a strong presence in Africa. In addition to Apple Pay, Apple launched some other financial services related to the digital flow of money: Apple Cash and Apple Pay Later. The first one was launched in the United States in 2017 and comes with an Apple Card that allows apple users to send and receive money in iMessage or Wallet, while the second one is an extended feature of Apple pay that gives the possibility to users to split the total amount of a payment into 4 equal installments over a period of six weeks.

Very similar to Apple, also the other members of the GAMAM added to the market their payment platforms. Introduced in 2007, Amazon Pay is a tool for online payment that directly retrieve the payment information saved on the amazon account of the user. Google launched Google Pay as digital payment service for android users in 2011 under the name of Android Pay. It then switched name to Google Pay in 2018, a rebranded digital wallet for online and in store purchases, with also the feature of sending money to anyone with a google account. Tencent also plays a key role in this market, with WeChat Pay, having great success in China, and lastly Meta provided Meta Pay, accessible for online payments on Facebook, Instagram, WhatsApp, and Messenger.

[7] Statista, 2023. 'Apple Pay – Statistics and Facts'

ii) Lending and Other Credit

In recent years*, Big Tech* businesses all around the world have started to provide lending services to individuals and businesses either directly or in collaboration with financial institutions. Even though the percentage of alternative credit[8] is still very small compared to the total amount provided by financial institutions, both *Big Tech* and *FinTech* presence in the credit market is growing at a rapid pace.

Tech companies were able to overcome the *FinTech* companies – despite the early entrance in the market - in terms of credit amount provided thanks to their status of *Big Techs*. They can harness vast, detailed user data, frequently sourced from non-financial activities, to address issues of asymmetric information. The extensive data that *Big Tech* companies possess enables them to accurately assess loan quality, potentially leading to a reduction in loan defaults.

In 2013, the credit available coming from both *Big Techs* and *FinTechs* was only $20 billion. Six years after, that amount grew almost forty times ($995 bn). In 2019, the amount of different types of credit provided by the *Big Techs* was $572 billion, increasing by 44% compared to 2018. The same year *FinTech* credit amounted to $223 billion, declining by 24% from the previous year. The subdivision of alternative credit between *Big* and *FinTechs* clearly explains the position of dominance the tech giants achieved towards the fintech world. As shown in the table below (Figure 4), 2017 was the last year of supremacy in the field for *FinTechs* as they accounted for 68% of alternative credit. The following year *Big Techs* jumped on top, ending 2019 with a market share of alternative credit of 72% (Cornelli et al., 2023)[9].

[8] Credit options offered by Big Techs and FinTechs.

[9] The data used has been collected by the authors of the following research paper: Cornelli Giulio, Jon Frost, Leonardo Gambacorta, P. Raghavendra Rau, Robert Wardrop, and Tania Ziegler, 2023, Fintech and big tech credit: Drivers of the growth of digital lending, Journal

Figure 4 - Alternative credit flow. Source: Cornelli et al., 2023

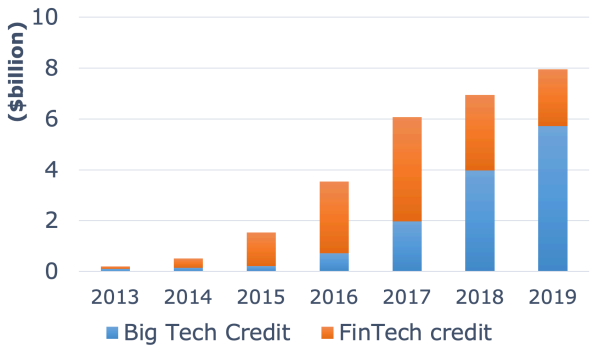
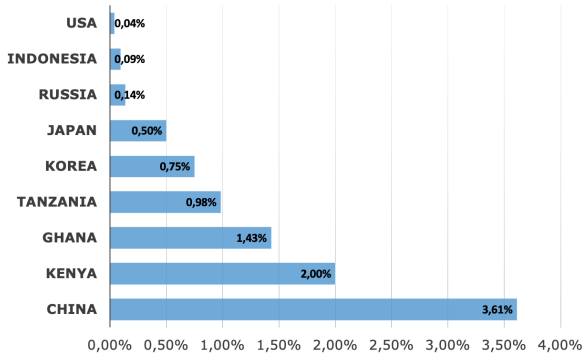


Figure 5 – Big Tech credit as a percentage of GDP (2019). Source: Cornelli et al., 2023



China is the largest market for *Big Tech* lending, followed by Japan, Korea, and the US. According to data collected from the People's Bank of China, in 2019, Chinese tech's subsidiaries such as Ant Financial (Alibaba), WeBank (Tencent) and Du Xiaoman (Baidu), lent out $515 billion (3.6% of GDP[10]), accounting for 90% of the global *Big Tech* loans. The variety of plans offered to the public span from student loans and commercial loans for small enterprise, to smartphone-based consumer loans. Japan's *Big Tech* lenders take second place with $26 billion in loans (0.5% of GDP in 2019). Rakuten is the major player in this country and provides credit cards, mortgages, and transaction lending. Differently, Amazon offers its lending programs also in Japan in collaboration with the Telecommunication company NTT DoCoMo which provides credit scores of borrowers. Placed on third place we find Korea, registering a total amount of BigTech credit of $12 billion (0.75% of GDP), most of which was offered by two tech giants' subsidiaries: KakaoBank and KBank. They operate as a non-traditional bank with a virtual banking license, they have no branches, they rely entirely on digital platforms, always maintaining a deep operational

of Banking & Finance 148, 106742. FinTech credit data was collected from the annual CAAF global survey, while BigTech credit was obtain through contacts with central banks and bigtech firms, completing public available resources.

[10] GDP (2019) data source: World bank

connection with other sectors of the larger *Big Tech* organization. The financial services they offer are seamlessly incorporated into their parent company's "eco-system." Completing the top seed in the ranking there are the United States counting a *Big Tech* lending value of $8 billion (0.04% of GDP). In contrast to the overall lending scenario in the other three countries*, FinTech's* resulted the greater provider of alternative credit ($70 billion). In 2019 Amazon was the only among the American *Big Techs* able to sell a significant amount of loans. It arranged contracts for over $1 billion, serving 14000 US customers, using a corporate credit facility form Bank of America. (CNBC, 2020; Cornelli et al., 2023).

In the United States and in Europe *Big Tech* credit is having a slower introduction but the scenario is expected to evolve as in the past couple of years most of western tech giants brought to the market several lending plans. Apple, with its services buy now, pay later, devolves loans to new consumers through an owned subsidiary, Apple Financing LLC. In collaboration with Goldman Sachs, which it will facilitate access to Mastercard's network, Apple will manage the underwriting and lending allowing to earn transaction fees and exert more control over data. It also has the responsibility of absorbing losses in case of customer default (FT, 2022). Amazon, instead, implemented 6 different options for small business owners that are sellers on the e-commerce platform. These options are line of credit, merchant cash advances (MCA)[11], factoring[12], credit cards, Peer-to-peer financing (P2P), Amazon lending[13] (AmericanExpress, 2023).

[11] MCAs is a type of financing that works by getting a cash advance based on the purchase and sale of your future credit card income.
[12] Factoring is a type of financing in which a business would sell its accounts receivable (invoices) to a third party to meet its short-term liquidity needs.
[13] Amazon's online sellers can borrow working capital from Amazon at rates that may be less than other forms of lending.

iii) Wealth Management and Insurance

In a survey ran in 2021, 69% of wealth management consumers in North America (US and Canada) stated that they would consider using firms like Google, Apple or Meta to manage their funds if those companies would provide wealth management solutions (Accenture, 2021). At the same time, 87%[14] of wealth management firms perceive the provision of wealth management services from *Big Techs* as a threat, given their global dominant position. After imposing themselves in the digital payments and lending markets, *Big Techs* are starting to leave their footprint also in the wealth management sector. With their access to data and data processing capabilities, using complex algorithms and machine learning, companies like Amazon developed systems of robo-advisors that would cut costs for individuals. To do so, Amazon joined forces with Fidelity Lab to create a digital financial consultant that would advise consumers evaluating their stock portfolios (Racounter, 2021). In China Tencent launched a wealth management platform – Licaitong – that in 2019 managed $130 billion of client's assets (Liao, 2019), while InvestmentTech, a digital wealth management platform under Ant Group, the subsidiary of Alibaba, channeled investments amounting to $558 billion via Yu'ebao[15] and other products from roughly 170 asset managers, accounting for 15.6% of Ant's revenue in 2020 (Reuters, 2020).

Regarding the Insurance landscape, a survey asking if individuals would want tech companies to manage their insurance plans showed that India had the highest share of consumers willing to do so (25%), followed by Brazil (18%), Mexico (16%), and China (15%). *Big Techs* have instead reached lower trust in the US, in which 12% of the respondents were in favor, and in Europe where the average share of favorable respondent was

[14] Source: 'Private Banker International's 2021 Global Wealth Managers Survey'
[15] Yu'ebao is Ant's Mutual Fund.

8% (Statista, 2022)[16]. *Big Tech* companies have started to provide insurance plans for clients with the intent to exploit the growth of *insurtech* services. By *insurtech* we mean 'the use of technology innovations designed to find cost savings and efficiency from the current insurance industry model' (Investopedia). In 2018 the capital invested in new technologies for the insurance industry peaked at $10 billion, keeping the positive trend also the following year. Given the insurance sector's historical conservatism, these innovative shifts could profoundly transform the industry (Statista, 2023). Over the past few years, the 'Big 5' have made significant steps toward this market, and indications suggest that their involvement will continue in the future. In 2020, a subsidiary of Verily - Google's life science and healthcare arm- named Coefficient Insurance, partnered with Swiss Re, a giant in the sector, to provide precision risk solutions for employer stop-loss coverage. Amazon collaborated with Acko, an Indian insurance company that handles the insurance policies for Amazon customers who register via the app or website of the ecommerce. Thanks to Amazon's digital infrastructure, insurance premium will be lower, and the policies will be issued instantly. Similarly, Meta signed agreements with Indian banks with WhatsApp, aiming to launch micro-pension fund and health insurance through the messaging app. Microsoft has strengthen relationships with insurance leaders such as Swiss Re and Munich Re, but also collaborated with *insurtech* companies to provide cutting-edge digital solutions. Lastly, Apple had signed cooperation plans with insurers like Humana and Aetna, and agreed with John Hancock, an American company leader in the sector, to provide a free Apple Watch to clients that would buy Vitality Program, an insurance plan offered by John Hancock.

[16] Statista, 2022. 'Share of consumers who could imagine getting all their insurances from an internet company like Google or Apple globally in 2022, by country'.

4. The Impact of *Big Techs* in Finance

In the dynamic landscape of the global economy, the financialization of *Big Tech* companies stands out as a transformative force. As tech giants like Amazon, Google, and Apple explore opportunities beyond their core business into the financial services sector, multiple are the implications that can be observed. This chapter delves into the consequences of this shift. We'll explore how the *Big Techs* are reshaping the competitive landscape of financial services, fostering greater financial inclusion, and leaving a distinctive footprint in the developing nations. As we navigate these pivotal changes, we aim to provide a comprehensive understanding of *Big Tech's* growing influence in the world of finance.

4.1. Effects on Competition

Big Tech's entrance in the financial services market has been positively welcomed from consumers. *Big Techs* are able to offer to the public more efficient and cost saving services thanks to their ability to exploit the vast amount of data possessed, the technological expertise, the significant economies of scale, and the numerous network externalities. Moreover, the integration of *Big Techs* in finance can enhance more transparence in the supplier-customer relationship. *Big Techs* can grant more clarity given their reliance on online and data-centric approaches, giving the opportunity to clients to 'audit decision-making in detail', a possibility that often is not given from traditional financial companies when providing credit or investment counseling (ESMA, 2019). If instead we analyze this trend from the banking perspective, we can identify two main views. The first one is that the banking sector can benefit from the financialization of *Big Techs*, as they can be seen as complements in the market and therefore improve the overall performance of financial institutions. The second view, which is probably the more intuitive one, considers these new financial platforms as

a threat. As a matter of facts, tech giants accessed finance in two possible modalities: through direct competition or signing partnerships. The latter takes four main shapes. The first one consists in supplying 'only' technological solutions to financial entities, enhancing modernization and efficiency. The second works in the opposite direction, *Big Techs* seek support from financial incumbents to establish their own financial service. Join ventures or acquisitions, usually in the insurance industry, are the third type of partnerships. Lastly, *Big Techs* usually lean on financial markets and institutions seeking for funds exploiting their high credit worthiness since they do not rely on regular deposits like traditional banks (FSB, 2019).

Signing partnerships with financial incumbents not only could benefit *Big Techs*, but also the market itself. Financial companies that collaborated with *Big Techs* can monetize from these initiatives adding new revenue streams and innovate their products, and at the same time other financial competitors will be forced to follow this path of digitalization in order to survive the increasing competition, consequently providing better and cheaper services to consumers (FCA, 2023). Though, when tech giants decide to emerge in a new market directly, this could be a menace for financial incumbents. The threat could emerge in the long run, in a scenario in which *Big Techs* erode competition, gaining market powers and aggravate clients' satisfaction (FCA, 2023). M. Hodula, in a study carried out in 2022, showed evidence on the effects of *Big Techs* entry on competition in the lending market. In the paper is observed the relationship between alternative credit flows and bank's interest margins[17]. After analyzing data from 91 countries, it was found that exists a negative correlation between the two, meaning that as credit flows increase, bank's profitability declines. It was also found a reduction in interest rate spread,

[17] 'Difference between the interest paid and the interest received. It is a common indicator for bank's profitability' (Source: Investopedia).

probably given from the fact that the financial services market is changing and incumbents are reconsidering their prices (Hodula, 2023). Nevertheless, Cornelli et al. in a study ran on the same dataset, demonstrated that the majority of alternative credit flow has a greater impact in countries without a strongly competitive financial sector. Therefore, *Big Techs'* credit flow can be interpreted as complement in the financial industry, as it eases access to financial services (in this case credit lines) in those countries that necessitate it.

Potentially *Big Techs* can reach high market shares in the financial industry if are able to not disappoint their customers and to sustain a high brand value, avoiding what happened to banks and financial institutions. In 2006, 8 financial firms entered the ranking of the 50 companies with the highest brand value while *Big Tech*s were lagging. Today, in this ranking *Big Tech* occupy the first positions and the number of banks present in the list decreased. Though, in the last few years companies like Alibaba, Tencent and Meta, had been affiliated on the news from different scandals. The two Chinese companies faced allegations of working with government agencies to surveil Chinese residents and curtail freedom of expression, while Meta has been accused of illicit use of data and fake news campaigns (King, 2019).

Another issue that is addressed to market participants and regulators is potential threat of creation of monopolies. In fact, if in the long run *Big Techs* are successful in gaining constant power, this could actually be the case. Firstly, there is a risk of monopolistic use of data. As data becomes more valuable the more it is processed, *Big Techs* have significant advantages since the same data is used several times in their vast line of products and services. Therefore, this could lead to digital monopolies, using data as driver for price discrimination. For example, not only they could estimate a customer's credit reliability, but they could also set the

highest possible interest rate that the borrower would accept to get a loan, or also a maximum insurance premium the client would agree to. Using complex algorithms *Big Techs* would be then allowed to set a different price for different types of customers allowing them to increase sales and beat competition (Boissay et al., 2021). To tackle these problems, regulators must succeed in providing a credible system that won't allow *Big Techs* to misuse their powers.

4.2. Financial Inclusion

The World's Global Findex Database[18], on a sample of 128'000 respondents in more than 120 countries, showed that the percentage of people with a bank account through a financial institution or through a mobile money provider has increased by 50%, going from 51% to 76%. Surely, part of this growth can be attributed to the presence of new players in finance, such as *Big Techs*. In fact, *Big Techs* can enhance financial inclusion as they tend to provide cheaper services, generally with a simpler user-interface. Moreover, has been shown that banks lacked in providing some services homogeneously, excluding an important part of the world's population. For example, evidence from 2019 carried by the International Finance Corporation, showed that "45-55% of SMEs worldwide do not have an overdraft allowance, but would benefit from one, while 21-24% although they have accessed loans, they are in very limited or different regulations" (Mărăcine et al., 2020). Therefore, tech firms, with their global reachability can act as complementary forces offering alternative and innovative financial solutions in both developed and undeveloped markets (Liu et al., 2022). With respect to this view, Boissay et al. found evidence that the entry of *Big Techs* in the credit market benefited borrowers not served or partially served from financial institutions. It has been demonstrated that

[18] Source: The World Bank

in China, for example, leading platforms have empowered hundreds of millions of borrowers (individuals and small enterprises) with access to credit. This trend is not restricted to developing economies; even in mature markets, there is a noticeable impact. In the US, one of the countries with the strongest banking sector, the better use of data on personal transactions provided by *Big Techs* is expected to support up to 60 million of Americans without appropriate credit history to demand for loans.

Another important publication by the Bank for International Settlements has found evidence supporting this hypothesis. The study investigated if QR payments services provided by Ant Group, Alibaba's financial subsidiary, would allow firms to access to *Big Techs'* financial services. Observing data on more than 500'000 Chinese firms of different nature, it was proved that using simple QR codes as digital payment system would allow business to access with a grater probability the financial services that Alibaba offered, especially credit lines. In this specific example, QR codes payments have demonstrated to be a driver of financial inclusion. Not only it gives access to line of credit but it also allows merchants without a POS machine to accept digital payments improving the overall system of payments, providing informative data to the platform, in this case the *Big Tech*, creating a win-win situation (Beck et al., 2021).

However, in some cases a higher financial inclusion can have several drawbacks*. Big Techs* financial services consist in digital services provided on digital platforms. This can thus limit the access to people with a low-level of digitalization, for example elderly or undeveloped populations without access to mobile devices or internet. Also, expanding credit to low-middle income households or small businesses might increase excessively their level of debt, especially if the required financial checks are not adequate, or if the tools on which the *Big Techs* rely have a low accuracy.

Moreover, if this is combined with a low level of financial education, it could cause even greater financial damages (Jonker and Kosse, 2022).

i) Big Techs in Developing Economies

When reviewing The World Bank data (2021) on financial inclusion, it is evident that the majority of individuals without a financial account (24%) hail from the world's most underdeveloped nations. In developing economies, only about 20% of adults use formal financial institutions for savings, an important contrast to the over 50% in high-income OECD nations. The rest, even some with transaction accounts, depend on informal savings mechanisms which can be more expensive, carry higher risks, might be prone to misuse, and sustain financial informality (Pazarbasioglu et al., 2020). In these countries, the amount of credit that was needed for business of small-medium size in 2019 was about $8.1 trillion.

Observing the demand side, have been found contrasting factors that slowed down the financialization of developing economies. First, a good part of the population has volatile and low incomes, thus traditional financial services cannot be afforded. About half the individuals in Central and Latin America considered financial services too expensive. Second, the distance from financial institutions is considered a barrier for households in developing nations. In countries like Kenya and Indonesia, 30% of adults thought so, while on average in all developing countries this share falls at 20%. Third, a large share of people (around one fifth) does not possess the valid documentation, lacking official identification and leaving minimal evidence of their economic endeavors and possessions. Lastly, many underprivileged individuals, who haven't used formal financial systems, tend to be unfamiliar with such services and might lack the expertise to use them appropriately. A significant portion of them, often with limited education, are skeptical about these services. Furthermore, many small to medium enterprises may not manage their finances efficiently, increasing

their financial vulnerabilities. Thus, promoting financial literacy and implementing robust consumer protection measures are crucial to enhance financial inclusivity (Pazarbasioglu et al., 2020).

Big Techs, providing digital finance services, can in some parts overcome the lack of financial inclusion in developing economies providing low-cost and more efficient services, simpler to manage, without the need to open branches near their clients. As a matter of facts, from 2017 to 2021, there was a notable increase in account ownership among developing countries. The percentage of adults with accounts rose from 63% to 71%, marking an 8% growth. Sub-Saharan Africa, in particular, saw a surge in mobile money adoption driving this increase. Interestingly, this widespread growth was not confined to a specific region, as was the case between 2011 to 2017 when it primarily occurred in China and India (World Bank, 2021). Digital payment services played a pivotal role in this change. Studies have showed that that transitioning from cash could lead to yearly economic benefits amounting to one to two percent of GDP.

Compared to countries with well-established financial systems, the impacts of *Big Techs* is larger in undeveloped economies, as they present less competition to overtake and less stringent jurisdictions (Cornelli et al., 2023). Surely, part of the large impact is given from the fact that, while in developed western countries *Big Techs* have leveraged the pre-existing payment infrastructure set up by established banks and credit card firms to offer payment and credit services, in emerging markets of Asia, Africa, and South America, these tech giants deliver direct payments and credit services to their platform users without involving traditional banks (Jonker and Kosse, 2022).

To give an example of how impactful the entrance of *Big Techs*' entry was, it is interesting to investigate how Kenya managed to become one of the countries depending the most on digital finance. Kenya, in 2019, was

the second country with the highest level of BigTech credit accessed as percentage of GDP (2%) counting $2 billion of loan volumes. This value doubled from the previous year and compared to 2017 it increased more than 200% (Cornelli et al., 2023). This pertains to both individual and corporate lending facilitated by mobile money providers like Vodafone M-Pesa, which initially focused on payments but later expanded their range of financial services. Credit is extended through mobile interfaces, utilizing the existing mobile network and user data, typically with short-term tenors. Furthermore, researchers have discovered that mobile money services in Kenya and in other developing countries, have enhanced the income-earning capabilities of the economically disadvantaged, particularly women, while also strengthening their savings (Pazarbasioglu et al., 2020).

However, poor countries are subjects to higher risks driven by inadequate financial inclusion. For *Big Techs* would be much easier to establish financial monopolies and erode market competition in developing countries than in western economies, as their regulations are not as stringent, and the financial industry is weaker. Also, collection of data is limited in these countries, therefore tech companies' methods to issue financial services may lack of accuracy.

5. Regulatory Concerns

The entrance of *Big Techs* in the world of financial services brought to the market innovation, financial inclusion, efficiency, convenience, and many other benefits. It contributed to transform how some financial services are delivered and accessed. However, this wave of innovation raised remarkable regulatory concerns, calling into action regulators and public policy makers to avoid that the entrance may cause damages to the market at a global level.

Before exploring an ideal regulation approach that should be implemented in order to exploit *Big Techs'* benefits and limit the potential threats, it is necessary to distinguish between two of the main regulatory methods adopted in the majority of jurisdictions to supervise financial institutions: entity-based regulation (EBR) and activity-based regulation (ABR). In the entity-based approach, "regulations are applied to licensed entities or groups that engage in regulated activities (e.g., deposit taking, payment facilitation, lending, and securities under- writing). Requirements are imposed at the entity level and may include governance, prudential, and conduct requirements"[19]. Regulations are reinforced through various supervisory measures like monitoring and physical on-site inspections. In this regulatory approach ongoing interaction between supervisory entities and businesses is crucial, as it can constantly prevent potential accumulating risks. Lastly, supervisors have the power to enforce action such fining companies or revoking licenses. In the activity-based approach, "regulations are applied to any person or firm that engages in certain regulated activities, for example, facilitating the buying and selling of investments or operating lending activities"[20]. In this regulation method, compliance is not ensured by supervisors, but only by enforcement actions (e.g., fines). At some extent, the ABR enhances competition as it requires regulation only for specific types of activities. These activities need to be delineated in every detail, leaving no room for ambiguity, which in turn can lead to arbitrage opportunities. This challenge becomes particularly significant in the rapidly evolving financial sector, necessitating that regulators remain constantly updated and vigilant. Also, this regulatory system is not very efficient for cross-border activities, unless the

[19] Source: Fintech notes (2022) imfsg. Available at: https://doi.org/10.5089/9781557756756.063
[20] See 20.

jurisdictions of the different countries allow cross-country enforcement actions (IMI, 2021).

Banks and insurance institutions follow an entity-based system, having to follow exhaustive regulations since they can bring systemic risk (especially banks) in the jurisdiction as they carry three fundamental services: deposits, lending, and payment systems. Even if *Big Techs* started to offer the same services as financial institutions, they have not been treated as such. Indeed, tech giants and their financial subsidiaries are subject to non-bank regulations systems such as the activity-based regulation. *Big Techs*, as long as they are able to continue their activities in the financial industry without taking deposits or underwriting insurances, can avoid the stringent regulatory checks under the entity-based system. This ease on regulatory approach on tech giants might create unfairness in the competitive landscape with other financial institutions (IMF, 2022).

Big Techs' entities and services, if taken singularly should not have negative implications, but if considered collectively they might imply systemic risks. To control these possible risks brought by *Big Techs*' entry, the International Monetary Fund has individuated as a possible but at the same time very challenging solution a mix of the two main approaches, similarly to what happened with shadow banking.[21] A mixed-approach regulation would allow tech companies to offer financial services under an entity-based system but with requirements that would suit the specific activities carried by the entities (IMF, 2022). With a mixed approach the location of home and host jurisdictions play a crucial role. An ideal and practical approach that would produce positive result in the long term should consider applying an activity-based system in the host jurisdictions, with group-wide supervision to manage risks specific to *Big Techs*' entities.

[21] Shadow banks are financial institutions that offer lending, brokerage and other credit services without operating beyond the scope of conventional regulated banks (Investopedia).

At the same time, home jurisdictions should implement thorough supervisory regulations, even if in the short might be very difficult to achieve. To fix this problem in the short term many countries interacted with *Big Tech*s encouraging provision of credible codes of conduct and disclosure requirements as a way to help regulators to identify risks, improve governance, and use minimum resources (IMI, 2021) .

In a speech at conference at the beginning of 2023, Agustín Carstens, General Manager of Bank for International Settlements (BIS) has proposed three possible practical approaches to manage *Big Techs*' operability in financial services. The first one is a restriction approach which would simply forbid *Big Techs* to engage in financial services activities. This approach, on one hand would eliminate the regulatory concerns, but on the other it would disallow a beneficial innovation of financial products. The second approach is the segregation approach which would need all *Big Techs'* financial services to get together under a holding company. These subsidiaries would need to meet specific regulatory standards to ensure stability. To prevent contagion risks, measures like banning shared technological platforms and data-sharing between financial and non-financial divisions could be enforced. While this approach enhances transparency and simplicity, it might discourage *Big Tech* firms from realizing benefits like synergies, economies of scale, and cross-sector data insights, potentially leading some to exit the financial services sector. The third and last one is the inclusion approach which increases requirements on governance and imposes group-wide obligations on the code of conduct and operational reliability of *Big Techs*. This approach recognizes that the primary risks posed by *Big Techs* are often associated with their data-centric business models rather than just their financial stability. These requirements would apply to the entire group, encompassing both the *Big Tech* parent company and its subsidiaries. The last two approaches, the segregation and the inclusion, can somehow be complementary. Combined together, a new holistic

approach would create a prudential sub-consolidation for the financial segment of a *Big Tech* group (similar to the segregation approach) while also implementing group-wide regulations related to governance, business conduct, and operational resilience (similar to the inclusion approach). This balanced approach ensures that data usage efficiency is not compromised by overly stringent ring-fencing measures (BIS, 2023).

The regulation topic is a very complex one, given the fact that the market is in constant evolution and therefore challenges will still emerge. Though, it is necessary saying that flexibility is the key element in this matter. If regulators are able to approach the possible risks with flexibility, aligning strategies with both short-term feasibility and long-term ideals, there is a really good chance to develop an adaptive regulatory and supervisory framework that proves to be effective over time.

6. Conclusion

In the paper we observed that *Big Tech* companies boast of the highest revenues, market capitalization, brand value and consumer base across the global tech industry. Taking advantage of the households' lack of trust in banks after the great financial crisis, the big waves of innovation and digitalization, and their status of *tech giants*, *Big Techs* succeeded in emerging into the financial services industry leaving a distinctive footprint. Even if financial solutions represent a marginal fraction of these companies' revenues, there are high expectations for an exponential growth.

The areas in which *Big Techs* already occupy a significant position are the digital payments sector, the lending and credit market, and lastly the wealth management and the insurance field. US companies like the GAMAM (Google, Amazon, Meta, Apple, Microsoft) and the Chinese titans BAT (Baidu, Alibaba, Tencent) are investing highly in improving their already

existing financial products, implanting new services, and partnering with financial institutions. Evidence showed that companies operating on the Asian market are more advanced in the sector, but US Big 5 companies are expected to quickly catch up.

Moreover, the paper explores the transformative effects that *Big Techs*' entry into the financial sector has on market dynamics and consumer behavior. The paper comprehensively analyzes the competitive landscape, as well as the potential benefits and risks associated with financial inclusion. Due to their access to extensive data, technological prowess, economies of scale, and network advantages, *Big Tech* firms are uniquely positioned to offer cost-effective services to consumers. These services are not only more transparent but also highly efficient, as *Big Tech* companies can craft personalized solutions based on rich consumer data profiles. Though, empirical research has proved that increases in credit services provided by *Big Techs*, impact negatively the profitability of the banking sector. Therefore, for financial incumbents an uncontrolled expansion of *Big Techs*, could be a menace. In particular, the increasing power and brand value of *Big Tech* companies could emphasize potential monopolistic practices and misuse of consumer data. Regarding financial inclusion, *Big Techs*, lowering costs for customers, were able to fill a gap left by traditional banks, especially in addressing the financial needs of small-to-medium enterprises and underserved populations. It is in fact in developing economies that alternative services provided by these companies had the biggest relative impact. However, this rising financial inclusion is not without risks, such as the potential for increased debt among households and small businesses, as well as the heightened possibility of financial monopolies in developing nations with less stringent regulations. Therefore, while *Big Techs* offer a promising avenue for financial inclusion, prudent regulatory oversight and consumer education are imperative.

Lastly, the paper gives an overview of the regulation approaches suggested to limit the risks from the entry of *Big Techs* in finance. Institutions advice that a mixed approach between the activity-based system and the entity-based system would be the solution to avoid an uncontrolled expansion of *Big Techs*. Also, a more practical method, combining the segregation and inclusion approach, would help manage the risks without stifling innovation. Though, flexibility in regulatory strategy is crucial for adapting to the evolving landscape and ensuring effective oversight in the long term.

Bibliography

Alibaba Group | Company Overview & News (no date) *Forbes*. Available at: https://www.forbes.com/companies/alibaba-group/?sh=56d9788d19f5

American Express Business Blueprint (2023) *6 Amazon lending options for Small Business Owners: Business Blueprint Resource Center*, *American Express Business Blueprint Resource Center*. Available at: https://www.americanexpress.com/en-us/business/blueprint/resource-center/finance/amazon-loans/

Baidu | Company Overview & News (no date) *Forbes*. Available at: https://www.forbes.com/companies/baidu/?sh=3c7b625c53f2

Beck, T.B. *et al.* (2022) *BIS working papers - Bank for International Settlements*. Available at: https://www.bis.org/publ/work1011.pdf

Best, R. de (no date) *Topic: Apple pay*, *Statista*. Available at: https://www.statista.com/topics/4322/apple-pay/#topicOverview

Big Tech's dominance is straining the logic of passive investing (no date) *The Economist*. Available at: https://www.economist.com/finance-and-economics/2023/07/20/big-techs-dominance-is-straining-the-logic-of-passive-investing

BigTech implications for the financial sector - european securities and ... Available at: https://www.esma.europa.eu/sites/default/files/trv_2020_1-bigtech_implications_for_the_financial_sector.pdf

BigTech in finance – FSB (2019). Available at: https://www.fsb.org/wp-content/uploads/P091219-1.pdf

Boissay, F. *et al.* (2021) *Big Techs in Finance: On the new Nexus Between Data Privacy and Competition*, *The Bank for International Settlements*. Available at: https://www.bis.org/publ/work970.htm

Bradshaw, T. *et al.* (2022) *Apple sidelines Goldman Sachs and goes in-house for lending service*, *Financial Times*. Available at: https://www.ft.com/content/fc4eeb5c-479a-4daf-9f8b-808ee937530f

Bromberg, M. (no date) *Shadow banking system: Definition, examples, and how it works*, *Investopedia*. Available at: https://www.investopedia.com/terms/s/shadow-banking-system.asp#:~:text=The%20shadow%20banking%20system%20consists,restrictions%20as%20traditional%20banks%20are

Brusnahan, P. (2022) *Big tech to shake up wealth management*, *Private Banker International*. Available at: https://www.privatebankerinternational.com/comment/big-tech-to-shake-up-wealth-management/?cf-view&cf-closed

Carstens, A. (2023) *Big Techs in finance: Forging a new regulatory path*, *The Bank for International Settlements*. Available at: https://www.bis.org/speeches/sp230208.htm

FS23/4: Potential competition impacts of Big Tech entry and expansion ... Available at: https://www.fca.org.uk/publication/feedback/fs23-4.pdf

Chevalier, S. (2023) *Top large cap e-commerce companies by market Cap 2023*, *Statista*. Available at: https://www.statista.com/statistics/245340/leading-large-cap-e-commerce-companiesmarketcap/#:~:text=With%20a%20market%20cap%20of,Alibaba%2C%20Prosus%2C%20and%20Pinduoduo.

China: A digital payments revolution (no date) *CGAP*. Available at: https://www.cgap.org/research/publication/china-digital-payments-revolution

Coleman, A. (no date) *Is Big Tech making a move on wealth management?*, *Raconteur*. Available at: https://www.raconteur.net/finance/big-tech-wealth-management

Companies ranked by Market Cap (no date) *CompaniesMarketCap.com - companies ranked by market capitalization*. Available at: https://companiesmarketcap.com/

Cornelli, Giulio, Jon Frost, Leonardo Gambacorta, P. Raghavendra Rau, Robert Wardrop, and Tania Ziegler, 2023, Fintech and big tech credit: Drivers of the growth of digital lending, Journal of Banking & Finance 148, 106742

Digital payments report 2023, *Statista*. Available at: https://www.statista.com/study/41122/fintech-report-digital-payments/

Financial crisis, five years on: Trust in banking hits new low (2012) *The Guardian*. Available at: https://www.theguardian.com/business/2012/aug/09/financial-crisis-anniversary-trust-in-banks

Fintech notes (2022) *imfsg*. Available at: https://doi.org/10.5089/9781557756756.063

Gaunt, J. (no date) *BigTech in finance brings big risks and benefits | article | ing think*. Available at: https://think.ing.com/articles/big-tech-brings-big-risks-and-rewards-to-finance/

Google, Amazon, Meta, Apple, and Microsoft (GAMAM) Statista. Available at: https://www.statista.com/study/47704/google-apple-facebook-amazon-microsoft-gafam/.

Hargrave, M. *Overview of insurtech & its impact on the insurance industry*, *Investopedia*. Available at: https://www.investopedia.com/terms/i/insurtech.asp

Hugh_son (2020) *Amazon unveils Small Business Credit Line with Goldman in latest tie-up between Tech and wall street*, *CNBC*. Available at: https://www.cnbc.com/2020/06/10/amazon-and-goldman-sachs-unveils-small-business-credit-lines-up-to-1-million.html#:~:text=The%20Goldman%20credit%20line%20will,one%20of%20the%20people%20said

III. Big Tech in finance: Opportunities and risks (2019) *The Bank for International Settlements*. Available at: https://www.bis.org/publ/arpdf/ar2019e3.htm

International Monetary Review, July 2021, vol. 8 no. 3 (no date) *IMI*. Available at: http://www.imi.ruc.edu.cn/en/PUBLICATIONS/InternationalMonetaryReview/dc4b604a4de541d78ca37041363ea29b.htm

Jonker, N. and Kosse, A. (2022) *The interplay of financial education, financial inclusion and financial ...* Available at: https://onlinelibrary.wiley.com/doi/10.1111/coep.12578

King, M.R. (2019) *The competitive threat from techfins and BigTech in financial services*, *SSRN*. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3457777

Liao, R. 2020. *The race to be China's top fintech platform: Ant vs Tencent, Tech Chrunch*

Liu, L., Lu, G. and Xiong, W. (2022) *The Big Tech Lending Model*, *NBER*. Available at: https://www.nber.org/papers/w30160

Mărăcine, V., Voican, O. and Scarlat, E. (2020) *The digital transformation and disruption in business models of the banks under the impact of Fintech and BigTech*, *Proceedings of the International Conference on Business Excellence*. Available at: https://doi.org/10.2478/picbe-2020-0028

Neufeld, D. (2023) *Ranked: The top 100 brands by value in 2023, Visual Capitalist.* Available at: https://www.visualcapitalist.com/top-100-brand-value-2023/.

Reddel, S. (2023) *How far could big techs go in wealth management?*, *Accenture Capital Markets Blog*. Available at: https://capitalmarketsblog.accenture.com/how-far-could-big-techs-go-in-wealth-management

Ross, S. *What net interest margin is typical for a bank?*, *Investopedia*. Available at: https://www.investopedia.com/ask/answers/061715/what-net-interest-margin-typical-bank.asp

Rudden, J. (2022) *Big Tech as insurance providers globally 2022*, *Statista*. Available at: https://www.statista.com/statistics/1332136/share-consumers-willing-to-get-insurance-from-an-internet-company/

Rudden, J. *Topic: Insurtech*, *Statista*. Available at: https://www.statista.com/topics/4116/insurtech/#topicOverview

Tencent Holdings | Company Overview & News, *Forbes*. Available at: https://www.forbes.com/companies/tencent-holdings/?sh=2253bbaa158b

Top 10 biggest companies in the world by market cap in 2023 Forbes India. Available at: https://www.forbesindia.com/article/explainers/top-10-largest-companies-world-market-cap/86341/1

Top 100 companies: FinTech, Statista. Available at: https://www.statista.com/study/140102/top-100-companies-fintech/

Why our trust in banks hasn't been restored (2015) *Harvard Business Review*. Available at: https://hbr.org/2015/03/why-our-trust-in-banks-hasnt-been-restored

World Bank Group (2020) *How countries can expand access to digital financial services*, *World Bank*. Available at: https://www.worldbank.org/en/topic/financialsector/publication/digital-financial-services

World Bank Group (2023) *The global findex database 2021*, *World Bank*. Available at: https://www.worldbank.org/en/publication/globalfindex

Zhu, J. and Yang, Y. (2020) *Explainer: Ant Group's key revenue drivers as it eyes $200 billion valuation*, *Reuters*. Available at: https://www.reuters.com/article/us-ant-group-ipo-business-explainer-idUSKBN25M0XT