

## **Financial Technology, Regulation, and Inclusion Effects on Business Outcomes in Major World Economies**

Ni Luh Putu Agustini Karta<sup>1</sup>, I Wayan Pariasta Bendesa<sup>2</sup>, Stephanus Remond Waworuntu<sup>3</sup>  
and I Nyoman Susila<sup>4</sup>

<sup>1,2</sup> Triatma Mulya University Bali Indonesia

<sup>3</sup> President University Jakarta Indonesia

<sup>4</sup> Satya Wacana University, Salatiga Indonesia

**Abstract.** Financial inclusion is one of the top priority issues as an important key towards reducing extreme poverty and increasing shared prosperity by giving people easier access to financial facilities. The World Bank and the G20 countries have a high commitment to providing financial inclusion for organizations, companies and the general public. The issue of financial inclusion was greatly amplified during the COVID-19 crisis. The objective of this study is to find out the relationship between financial inclusion, financial technology and financial regulation on business performance. This research uses the variables provided by the Enterprise Survey for data published in June 2022 carried out by the World Bank called the World Bank Enterprise Survey or WBES June 2022. SmartPLS was used for the data analization method. The results of this study found that financial technology has a positive influence on financial inclusion and financial performance, both by itself and mediated by financial inclusion. However, financial regulation has a negative impact on financial inclusion and business performance, either by itself or mediated by financial inclusion. This research suggests investors and entrepreneurs in the future to improve their company's performance by increasing the financial inclusion and financial technology of the company. In addition, this study suggests regulators provide relief from regulations on the use of financial facilities so that companies can carry out business activities smoothly.

**Keywords:** digital finance, business, technology, inclusion, regulation, performance, innovation

### **1. Introduction**

One of the top priority topics in the world economy is financial inclusion (The World Bank, 2022). Financial inclusion provides individuals and business organizations with adequate access to financial facilities in the form of responsible and sustainable transactions, payments, deposits, credit and insurance. Each country has a high commitment to realizing fast, credible and efficient business transactions. Likewise, with the G20 Countries which are a forum of the twenty largest economies in the world that meet in a scholarly way to discuss pressing problems faced by the global economy (Hutt, 2022). G20 countries GDP is over 80% of world GDP, 75% of global trade, and 60% of the planet's population. The members of the G20 countries are Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, South Korea, Mexico, Russia, Saudi Arabia, South Africa, Turkey, United Kingdom, United States and the Union. Europe.

The history of the G20 began in 1999, when the Asian financial crisis served as a forum for ministers of finance and central bank governors from developed and developing countries to discuss global

financial issues (Hajnal, 2019). During the 2008 global financial crisis, the G20 developed into a meeting of leaders where presidents and prime ministers could gather for two days to solve world economic problems. Successive G20 leaders' meetings were held in Washington DC in 2008, London in early 2009, and Pittsburgh in late 2009. Since then, meetings of the G20 have been held annually. The most recent meeting at the time of writing this research was the G20 meeting in Bali, Indonesia (2022). The theme of the G20 meeting in Bali in November 2022 is "Recover Together, Recover Stronger", or recovering together, recovering stronger. On November 16, 2022, the country leaders of the G20 discussed such subjects as the war between Russia and Ukraine, climate change and monetary policy (Reuters, 2022). The G20 countries have several goals to achieve (G20, 2022). First, policy coordination between members to achieve global economic stability and sustainable growth. Second, promote financial regulations that reduce risk and prevent future financial crises. Third, the modernization of the international financial architecture. To achieve economic stability and global growth, one of the aspects that G20 countries need to pay attention to is financial inclusion (Timmerman & Gmehling, 2017). At the meeting on 17 and 18 March 2017, G20 finance ministers and governors of the Central Bank, Germany committed to continue financial inclusion globally (GPFI, 2017). The term financial inclusion describes efforts to provide useful and affordable access to financial services for all individuals and businesses around the world. The emerging economies in G20 such as Indonesia rely on tourism as one of the main contributor to the economy, while others are also dependent as tourism activity goes beyond leisure.

The growing global interconnectivity and swift environmental transformations underscore the significance of competition in drawing foreign tourists. Tourism is increasingly regarded as a pivotal driver of economic expansion and progress in numerous nations. Consequently, this circumstance validates the allocation of resources aimed at enhancing competitiveness to attract a greater number of visitors. (Vasanicova, P.; Jancova, S.; Gavurova, B.; Bacik, R. *Coopetition*, 2022). Financial inclusion can contribute to economic growth and employment, can reduce inequality, and potentially increase financial stability. Financial inclusion is also an indicator that has a significant influence on 7 aspects of the 17 UN Sustainable Development Goals (UN, 2022). Tourism plays a role in diminishing poverty levels within developing nations, particularly in the least developed ones, when there is effective access to financial resources for individuals and small and medium-sized enterprises (SMEs) engaged in the tourism industry. (WTO, 2005). Financial inclusion empowers tourism enterprises and entrepreneurs to gain access to formal financial resources, thereby bolstering the necessary capital for their tourism ventures. The availability of financial resources is closely linked to innovation and fosters economic growth by enhancing productivity ((Ayyagari, Demirgüç-Kunt, and Maksimovic 2011) In emerging economies where banking-based financial systems predominate, the inclusion of banks in the financial sector greatly facilitates financial inclusion, contributing to faster economic development through inclusive growth (Swamy, 2010). However, Swamy and Tulasimala (2011) illustrate that financial inclusion via microfinance models reduces the cost of financial intermediation for borrowers, resulting in accelerated economic development.

This study analyses several elements in the financial inclusion of G20 member countries. There are several factors that have a positive impact on financial inclusion. Financial technology is an instrument that can have a positive impact on financial inclusion (CFI Team, 2021). Technological developments have facilitated financial activities with the application of financial technology. Basically, financial technology is used to help companies, business owners and consumers to manage their financial operations. Financial technology makes it easier for everyone to access financial facilities, so that financial technology has the potential to provide greater financial inclusion. However, there are several factors that could potentially have a negative impact on financial inclusion. One of them is financial regulation. Financial regulations are fixed rules that can protect society and organizations against risks and fraud related to finance (Degirmenci, 2019). Financial regulations can provide protection for companies and organizations. However, financial regulations have the potential to provide companies with obstacles to their business activities. The financial inclusion of an individual or organization can provide increased performance from their business activities (Oranga & Ondabu, 2018). Business performance can be measured by several metrics that depend on the company. Performance measurement in a company is usually determined in the main work indicators or Key Performance Indicators (KPI). KPI has several indicators that can provide a measurement of a company's financial

performance. The most important business indicator in a business is profitability. With good financial inclusion, an individual or organization can improve their business performance.

This study aims to determine the relationship between several factors in companies from the G20 countries. These factors are financial technology, financial regulation, financial inclusion, and financial performance. Financial technology and financial regulations have the potential to affect financial inclusion. In addition, financial technology and financial performance have an impact on business performance, where financial inclusion can potentially act as an intermediary.

There are several previous studies that discuss the relationship between these variables. The relationship between financial technology and financial inclusion has been found by several studies. CFI Team (2021) found that financial technology can affect the financial inclusion of a region. Chatterjee (2021) concludes that financial technology can expand access to financial services and significantly reduce the cost of financial services. Apart from financial technology, financial regulation also has a potential relationship with financial inclusion. However, the relationship between financial regulation and financial inclusion is more complex than the relationship between technology and financial inclusion. Several studies such as Abor, Anarfo, and Osei (2019) provide the same conclusion. This conclusion is proven by research from Claessens and Rojas-Suarez (2016) and research from Davis, Sherwood, and Gecas-McCarthy (2022) which provide a negative or positive relationship between financial inclusion and financial regulation.

These three variables can have a positive influence on the business performance of a company. Research from R.V.S.P.K., H.M.S. and R.G.N. (2020) found that the use of financial technology is highly dependent on the digital literacy of the technology users. Research from Brock and Beer (2022) found that financial regulation has a positive and negative effect on business performance. In addition, aspects of financial inclusion such as financial literacy can have a significant and positive influence on business performance according to research from Oranga and Ondabu (2018).

In conclusion of the exhaustive literature review done, to the best of author's knowledge, there is a research gap understanding the influence of financial technology, financial regulation and financial inclusion on impacting business performance of companies in G20 countries. This research uses the variables provided by the Enterprise Survey for data published in June 2022. The World Bank in a survey carried out a survey called The World Bank Enterprise Survey (The World Bank, 2022). The Enterprise Survey is an enterprise-level survey of a representative sample of the private sector of the economy. The survey covers various business environment topics such as financial inclusion, corruption, infrastructure, competition and business performance. All findings from Enterprise Survey surveys can be viewed, downloaded, and used by the public for research.

These variables have varying values and depend on the questions given in the survey. This research was conducted to provide an overview of the influence of financial technology, financial regulation, and financial inclusion of companies in the G20 countries. Thus this will provide a better understanding on the research gap identified and for the betterment in addressing the UN's related SDG goals.

The Enterprise Survey from the World Bank provides observations of companies in the world in various fields such as manufacturing, services, electronics, food, and others. In addition, the companies surveyed included small, medium and large companies. The results of data collection from the Enterprise Survey contain data on international companies around the world from various corners and from various sectors. The results of this survey are in collaboration with several financial organizations such as the World Bank Group, European Bank for Reconstruction and Development (EBRD), Inter-American Development Bank (IDB), etc.

## **2. Literature Review & Hypothesis Development**

In this section, all four segments of Financial Technology, Financial Regulation, Financial Inclusion and Business Performance are discussed separately. The following section elaborates on the hypothesis development supported by literature review.

## **2.1 Financial Technology**

Financial Technology (Fintech) is a technology that seeks to improve and automate the delivery and use of financial services (Kagan, Estevez, & Belluco-Chatam, 2022). Financial technology is primarily used to help companies, business owners and consumers manage their financial operations. Financial technology mostly uses software used in computers and smartphones to help users in financial matters. Financial technology initially emerged in the early 21st century. The term originally described the back-end systems of established financial institutions such as banks. However, nowadays, financial technology can be owned by consumers in general. Financial technology at this time is consumer-oriented, so the definition of financial technology at this time focuses more on equipment or applications used by consumers in various financial activities using digital smartphone assistance such as money transfers, credit applications, investment management and others. Financial technology now includes several sectors and industries such as education, retail, non-profit, fundraising, investment management, etc. Financial technology can include digital money or e-money as well as crypto money or cryptocurrency. As many as a third of consumers use at least two or more financial technology services and these consumers are also increasingly aware of financial technology as part of their daily lives (EY Global Financial Service, 2019).

Financial technology literacy is the ability to acquire the knowledge, skills, confidence and competence to use digitally delivered financial products and services safely, so that individuals or organizations can make the right financial decisions and act in the best financial interests for every economic and social situation. To measure financial technology variables, several studies use frequency scale surveys, where the survey aims to find out how often an individual or company uses the adoption of this financial technology (Higgins, 2020). There are several technologies that are included in the financial technology or fintech section. Some of the adoptions of financial technology referenced from the survey are E-Banking / Mobile Banking Applications, E-Money Applications (PayPal, Venmo, GoPay, DANA), Personal Finance Applications (Mint, Wallet), Investment Applications (Robinhood), P2P Lending (Prosper, Lending Club, Upstart), Crypto Apps (Coinbase, Luno), Insurance Tech (InsurTech) and Roboadvisors.

## **2.2 Financial Regulation**

Financial regulations are fixed rules that protect society and organizations against risks and fraud related to finance (Degirmenci, 2019). Financial regulations are provided by the government so that the country's economy, businesses and consumers can operate effectively. Financial regulation establishes a well-functioning financial system that can protect society against all kinds of financial-related malpractices such as fraud. Financial regulation is the main reference point for the principles and procedures governing the formation, implementation and control of the budgets of several organizations in the world. More effective government oversight can prevent companies from taking excessive risks (Amadeo, Financial Regulations, 2022). For example, during the financial crisis in 2007-2008, which was the worst financial crisis in America since the Great Depression in 1929 (Amadeo, 2008 Financial Crisis, 2022).

Financial regulation can provide protection but sometimes hinders economic growth, because companies must use their capital to comply with federal regulations instead of investing in plant, equipment, and people. Regulation is not effective against businesses that create innovative products in unexpected areas. Some industry leaders can exert influence over regulators to their advantage and stifle competition. Financial regulation has different levels for each country. Measurements of financial regulation in previous studies such as those conducted by Harvard Business School (2018) measure several aspects of making financial regulations such as economic crises, pension funds, global investment managers, insurance, and political risk. Measurement of financial regulation is carried out by surveys such as the survey conducted by the World Bank (2022). The survey conducted by the World Bank called Enterprise Survey has a section related to regulations and taxes. Some of the variables seen from financial regulations are for example how long management must spend time dealing with permits or regulations.

## **2.3 Financial Inclusion**

Financial inclusion is an attempt to make financial products or services accessible and affordable to all individuals and businesses regardless of their personal wealth (Grant & Anderson, 2020). Financial inclusion aims to remove barriers that exclude people from participating in the financial sector and provide them with the opportunity to use these financial services to improve their lives.

The World Bank states that financial inclusion facilitates everyday life and helps families and businesses plan everything from long-term goals to unforeseen emergencies (The World Bank, 2020). According to the World Bank, as account holders, people are more likely to use other financial services, such as savings, credit and insurance. They also use financial services to start and grow businesses, invest in education or health, manage risk, and deal with financial shocks. According to the World Bank, these things can improve their overall quality of life. Over time, the financial industry has been constantly looking for new ways to provide products and services to the global public. The industry generates profits in the process of supplying these products to the global public. With the increasing use of financial technology or fintech, the financial industry has provided society with innovative tools to address the problem of inaccessibility of financial services and find new ways for individuals and organizations to obtain the services they need at a reasonable cost.

Financial inclusion is measured using a survey of the area of a location (The World Bank, 2015). Financial inclusion is carried out by public and private organizations. These organizations can conduct surveys that can provide a diagnosis of the state of financial inclusion in a region and monitor and measure policies or regulations in that area.

## 2.4 Business Performance

Business performance is the ability of a company, department or individual to achieve the expected goals and results (Riberolles, 2021). Business performance is closely related to commercial effectiveness. It is determined by the company's ability to implement an optimal organization with the aim of offering products or services that meet consumer and customer expectations. In practice, the term business performance usually refers to a company's company achievements as measured using a number of metrics known as Key Performance Indicators (KPI).

Every business has different KPIs and depends on the industry in which the business is running (Terpiłowski, 2022). In general, there are several key KPIs in business. The most important indicator of any type of business is profitability. However, these metrics can also vary depending on the industry. To implement the metrics used for measuring business performance, an organization or company needs to know what to measure first. This study examines business performance through three main indicators. Financial performance is the first indicator which is a subjective measurement of how well an individual or company can use its main assets and generate income (Kenton, Murry, & Courage, 2022). Financial performance is also a term used as a general measure of the financial health of an individual or company over a certain period. Analysts and investors use financial performance to compare similar companies in the same industry or to compare industries or sectors in the aggregate.

The measurement of financial performance in a business is still a topic of debate (Usama & Yusoff, 2019). Aspects that are usually measured in financial performance are return on assets, return on sales, return on investment, return on equity, market share, and operational efficiency (Gentry & Shen, 2010). In addition, measurement of financial performance can be carried out through several aspects, such as gross profit margin, working capital, net profit margin, quick ratio, current ratio, etc. (Bhasin, 2020)

In this study, measurement of financial performance is done by measuring real annual sales growth (Real Annual Sales Growth). Real annual sales growth is measured as the percentage change in sales between the most recently completed fiscal year and the previous period. All sales values are deflated to 2009 using the deflator of each country's GDP with a certain formula as follows:

$$\left(\frac{1}{t}\right) * \frac{d2' - n3'}{(d2' + n3'')} * 100$$

$t$  = The number of years between the first period and the next period.

$d2$  = Total value of annual sales in the most recent fiscal year.  
 $n3$  = Total sales value of the past three fiscal years.  
 $d2'$  = Deflated value of  $d2$ .  
 $n3'$  = Deflated value of  $n3$ .

Employee performance is the second performance that describes how the performance of employees of a company or organization can have a significant impact on their success or failure (Donohoe, 2019). Employee performance involves factors such as quality, quantity, and work effectiveness as well as the behavior shown by employees at work. A company sets performance targets for both individual employees and the company as a whole with the hope that they will offer good value to customers, minimize waste, and streamline operations.

In this study, employee performance is calculated by two indicators, namely annual employee growth and annual labor productivity growth. Annual employment growth expressed as the percentage change in reported full-time employment in the current fiscal year from the previous period is formulated by the following formula.

$$\left(\frac{1}{t}\right) * \frac{l1 - l2}{(l1 + l2)/2} * 100$$

$t$  = The number of years between the current period and the previous period.

$l1$  = Full-time permanent worker at the end of the fiscal year.

$l2$  = Full time permanent worker three fiscal years ago.

Annual labor productivity growth is measured as the percentage change in labor productivity between the last completed fiscal year and the previous period. Labor productivity is sales divided by the number of full-time permanent employees. All sales values are deflated to 2009, which is formulated as follows:

$$\left(\frac{1}{t}\right) * \frac{\left(\frac{d2'}{l1}\right) - \left(\frac{n3'}{l2}\right)}{\left\{\left(\frac{d2'}{l1}\right) + \left(\frac{n3'}{l2}\right)\right\}/2} * 100$$

$t$  = The number of years between the first period and the next period.

$d2$  = Total value of annual sales in the most recent fiscal year.

$n3$  = Total sales value of the past three fiscal years.

$d2'$  = Deflated value of  $d2$ .

$n3'$  = Deflated value of  $n3$ .

$l1$  = Full-time permanent worker at the end of the fiscal year.

$l2$  = Full time permanent worker three fiscal years ago.

The third indicator is business efficiency, which is how much a business can produce for one unit of input (Spacey, 2017). Business efficiency can be in the form of business efficiency calculated by capacity utilization based on a comparison of the current output or output with the maximum possible output using the current input.

## 2.5 Hypothesis Development

The theory of the relationship between financial technology and financial inclusion is supported by several studies, namely CFI Team (2021), Chatterjee (2021), P. K. Ozili (2018), and Durai and G (2019). These studies find that financial technology has a positive influence on financial inclusion. From these empirical findings, the following hypotheses were made:

$H_1$ : Financial Technology has a positive effect on Financial Inclusion

The theory of the relationship between financial regulation and financial inclusion is supported by several studies, namely Abor, Anarfo and Osei (2019). Mobile Money (2019), Claessens and Rojas-Suarez (2016), and Davis, Sherwood and Gecas-McCarthy (2022). These studies have concluded that

financial regulation has a positive influence on financial inclusion. The hypothesis made based on the above research is as follows.

H<sub>2</sub> = Financial Regulation has a positive effect on Financial Inclusion

The theory of the relationship between financial technology and business performance is supported by several studies, namely R.V.S.P.K., H.M.S. and R.G.N. (2020), Kulathunga (2020), and Sajuyigbe & Alabi (2012). The study concluded that financial technology has a positive influence on business performance. Directly, the relationship between financial technology and business performance is the hypothesis used in this research. The hypothesis is as follows.

H<sub>3</sub> = Financial Technology has a positive effect on Business Performance

The theory of the relationship between financial regulation and business performance is supported by several studies, namely Brock and Beer (2022), Banerjee & Majumdar (2018), Teall (2013), and Kemna (2015). The study concluded that financial regulation has a positive influence on business performance. The direct relationship between financial regulation and business performance is the hypothesis used in this study. The hypothesis is as follows.

H<sub>4</sub> = Financial Regulations have a positive effect on Business Performance

The theory of the relationship between financial inclusion and business performance has been supported by several studies, namely Oranga and Ondabu (2018), Vitenu-Sackey and Li (2019), and Nova, et al. (2020). These studies conclude that financial inclusion has positive influence on the business performance of an individual or organization. The hypothesis that can be made from the discussion above is as follows.

H<sub>5</sub> = Financial Inclusion has a positive influence on business performance

Financial inclusion can be a mediating variable between financial structure, financial literacy and one's financial behavior towards household financial resilience (Yovita et al., 2021). Financial literacy directly or through the mediation of financial inclusion can improve business performance (Irman, 2022). Then financial inclusion can act as a mediating variable between financial innovation and business performance or financial inclusion can be a variable mediating the relationship between financial innovation and business performance (Mutua et al., 2022). From some of this empirical evidence another hypothesis can be developed:

H<sub>6</sub> = Financial Inclusion further enhances the positive influence of the Financial Technology relationship on Business Performance

H<sub>7</sub> = Financial Inclusion further enhances the positive influence of the relationship between Financial Regulations on Business Performance

### **3. Methodology**

This research uses the variables provided by the Enterprise Survey for data published in June 2022. These variables have varying values and depend on the questions given in the survey. Based on the formulation of the problem, theoretical studies, and framework, a conceptual framework is designed to be able to explain the relationship between the variables used in this study. The framework can be seen in Figure 1 as follows.

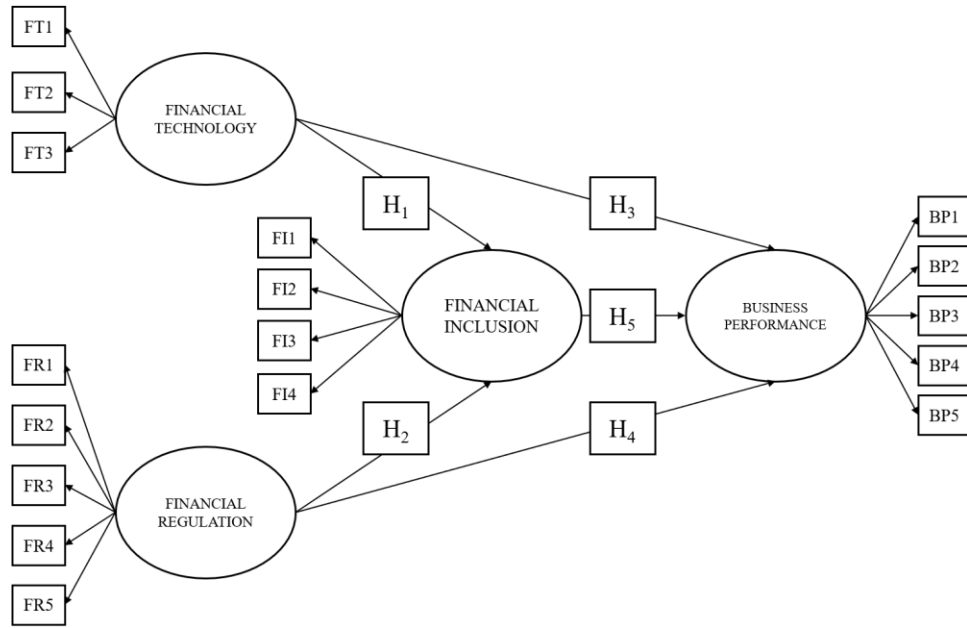


Figure 1. Conceptual Framework

The population data utilized in this study consists of companies gathered through the World Bank Enterprise Survey. In each country, the survey team conducts interviews with businesses located in the cities or regions where major economic activity is concentrated. The Enterprise Survey is conducted through face-to-face interviews with business owners and top managers. In some cases, these respondents may involve company accountants and human resource managers to provide input on the sales and labor sections of the survey. The survey specifically targets formal (registered) companies that employ 5 or more individuals for interview participation. Nonetheless, firms with 100% government or state ownership are not eligible to take part in the Enterprise Survey.

To gather information, the Enterprise Surveys Unit utilizes two distinct instruments: the Manufacturing Questionnaire and the Services Questionnaire. These questionnaires cover a range of standard topics, including firm characteristics, gender participation, access to finance, annual sales, input and labor costs, workforce composition, bribery, licensing, infrastructure, trade, competition, capacity utilization, land and permits, taxation, informality, business-government relations, innovation and technology, and performance measures. It is worth noting that more than 90% of the questions in the survey objectively assess the characteristics of a country's business environment. Whereas the remaining questions focus on gathering the survey respondents' opinions regarding the obstacles to firm growth and performance.

According to the World Bank (2022), a total of 1200-1800 interviews were conducted in companies with large economies, 360 interviews in moderate economies, and 150 interviews in small economies. The goods and services sectors are the main business sector that is of interest to the Enterprise Survey. This corresponds to companies classified under ISIC codes 10-33, 41-43, 45-47, 49-53, 55-56, 58, 61-62, 69-75, 79, and 95 (ISIC Rev.4).

The sampling methodology of the Enterprise Survey has been described in the documentation of the enterprise analysis unit of the Enterprise Survey in a document entitled Enterprise Survey Sampling Methodology (2022). The sampling methodology of Enterprise Survey results in a sample size suitable for achieving two main objectives. The data sampling method used in collecting Enterprise Survey data is a stratification method in which the population is divided into homogeneous sub-populations called strata based on certain characteristics (Thomas, 2022). These characteristics can be seen in Table 1 as follows. In this approach, the survey divides firms into different strata based on firm size, business sector, and geographic region within a given country.



When it comes to firm size, the categories are defined as follows: small firms with 5-19 employees, medium-sized firms with 20-99 employees, and large-sized firms with 100 or more employees. In terms of business sectors, the survey typically includes manufacturing, retail, and other services. In the case of larger economies, the survey may further stratify manufacturing into specific sub-sectors based on factors such as employment, value-added, and the total number of establishments. Additionally, geographic regions within a country are selected based on where the majority of economic activity is concentrated, typically involving key cities or regions.

Ideally, the survey's sample frame is derived from a list of eligible firms obtained from the country's statistical office. This structured approach ensures a representative and comprehensive sampling of firms for the Enterprise Surveys.

Table 1 *Some Characteristics of Companies from the Enterprise Survey*

No	Description	Example
1	Country	Indonesia
2	Region	SA R
3	Sector_MS	Manufacturing
4	Size	Small (<20)
5	á2x (city of the company)	Jawa Barat
6	'b1 (legal status of company)	Limited Partnership

Source: *Enterprise Survey G20 2022*

The total companies surveyed from 2006 to 2021 form panel data of 180,067 data, then the data is separated into 2 groups, namely G20 countries and non-G20 countries referring to the list of names of countries included in the G20 country group which consists of South Africa, United States, Saudi Arabia, Argentina, Australia, Brazil, India, Indonesia, United Kingdom, Italy, Japan, Germany, Canada, Mexico, Republic of Korea, Russia, France, China, Turkey and the European Union.

Tabel 1. World Bank Enterprise Survey (WBES) Data

GRP	Count of country	Sum of Total
G20	34	61,476
NonG20	120	118,591
<b>Grand Total</b>	<b>154</b>	<b>180,067</b>

Source: *Enterprise Survey G20 2022*

Of the 40 lists of countries that are members of the G20 countries, there are 6 countries that were not found in the World Bank Enterprise Survey (WBES) database, namely USA, SAU, KOR, JPN, CAN and AUS. Further re-evaluation of country data that completely met the criteria, there were 18 countries that were complete and 16 countries that were incomplete so that only 18 countries with complete data were analyzed. These countries are described in the following Table 3.

Table 3. G20 Countries That Meet the Criteria Analyzed

No	wbcode	Country	Total Data
1	AGR	Argentina	1,323
2	BRG	Bulgaria	541
3	BRA	Brazil	673
4	CHN	China	1,418
5	EST	Estonia	105
6	HRV	Croatia	285
7	HUN	Hungary	124
8	IDN	Indonesia	1,476

9	IND	India	5,954
10	LTU	Lithuania	108
11	LVA	Latvia	99
12	MEX	Mexico	1,645
13	POL	Poland	137
14	ROU	Romania	166
15	RUS	Russia	919
16	SVN	Slovenia	136
17	TUR	Turkey	849
18	ZAF	South Africa	590
		Grand Total	16,548

Source: *Enterprise Survey G20 2022*

Identification of each variable and indicator distributed to micro, small, medium and large companies for several aspects/fields, among others, is explained in the following table:

Table 4.

List of World Bank Enterprise Survey Sectors

No	Field	Number of Questions/Indicator
1	Regulations and Taxes	8
2	Corruption	14
3	Crime	9
4	Informality	5
5	Gender	6
6	Finance	22
7	Infrastructure	17
8	Innovation and Technology	7
9	Trade	16
10	Workforce	18
11	Firm Characteristics	15
12	The Biggest Obstacle	15
13	Performance	5
Number of Questions / Indicators		157

Source: *Enterprise Survey G20 2022*

This study provides observations of four variables. These variables are Financial Technology, Financial Regulation, Financial Inclusion, and Business Performance. The data collected is analyzed using PLS-SEM within the SmartPLS 3 software. The choice of this technique is rooted in the observation that SEM-PLS frequently generates estimates with superior statistical power and delivers results that closely correspond in terms of statistical significance and path coefficient estimates (Memon et al., 2021). Additionally, it enables the exploration of causal relationships between research variables and facilitates the testing of the hypotheses presented in this study. By using SmartPLS, the variables used in this study are divided into exogenous (independent), endogenous (dependent), and mediating variables.

#### 4. Results And Discussion

The research had the objective of evaluating how Financial Technology (FT) and Financial Regulation (FR) variables influenced Business Performance (BP) variables, by incorporating Financial Inclusion (FI) as a mediating factor. To achieve this, a model (refer Figure 1 of the appendix) was constructed using SmartPLS 3 software, considering a single endogenous variable, three exogenous variables, and up to 17 indicators. This model was created for the purpose of conducting inferential analysis.

## 4.1 Result

The initial phase of inferential analysis in this study involves conducting validity tests using four different approaches: convergent validity, average variance extracted (AVE), discriminant validity, and composite reliability. The findings of these tests are tabulated in the appendix section (refer Table 1 to Table 4). The final model generated with the valid indicators are presented in Figure 2.

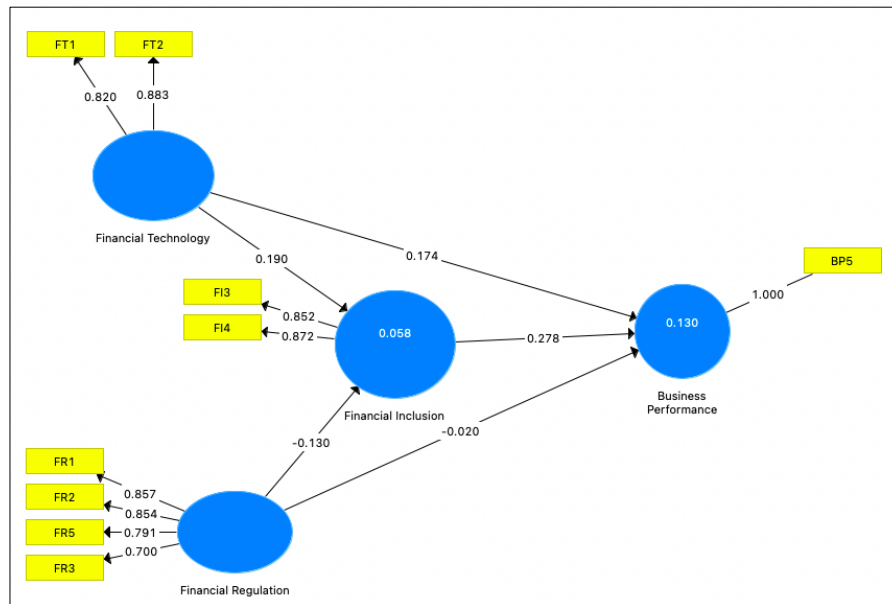


Figure 2. Final model (after validity test)

The R-squared ( $R^2$ ) and adjusted R-squared ( $R^2$  adjusted) values are crucial metrics in understanding the goodness of fit and explanatory power of our statistical model. Table 5 presents the R-Square test results for endogenous variables. In this study, Financial Inclusion has an R-squared value of 0.058, indicating that approximately 5.8% of the variability in Financial Inclusion can be explained by the independent variables included in the final model. This suggests that while the final model does provide some insights into the factors influencing Financial Inclusion, there are likely other unaccounted-for variables or sources of variation. The R-squared adjusted value remains the same, as there are no additional independent variables considered.

Similarly, for Business Performance, the R-squared value observed is 0.130, meaning that approximately 13% of the variance in Business Performance can be attributed to the variables in the final model. This suggests that the final model explains a reasonable portion of the variation in Business Performance, but there may still be other factors outside of the model contributing to this variable's performance. Again, the R-squared adjusted value remains the same as no additional independent variables are introduced. These values help to assess the explanatory power of the final model, and while they indicate some level of explanation, there is room for further exploration of unexplained factors.

In other words, the R-Square values associated with Financial Inclusion and Business Performance fall into the "Weak" category, indicating a limited degree of variation explained by these exogenous variables in relation to the endogenous variables.

Table 5. R-Square Test Results For Endogenous Variables

	R Square	R Square Adjusted
Financial Inclusion	0.058	0.058
Business Performance	0.130	0.130

Following the R-Square analysis, the examination of effect size, known as f-Square, is conducted to quantify the extent of influence exerted by exogenous variables on endogenous variables. The findings from the f-square analysis are presented in Table 6. The outcomes gleaned from Table 6 shed light on the extent of influence of various variables at the structural level. Specifically, it is evident that the Financial Inclusion variable demonstrates a moderate level of influence on the Business Performance variable with f-square value of 0.084. Furthermore, at the structural level, the Financial Technology variable exhibits a moderate level of influence on both the Financial Inclusion ( f-square value 0.038) and Business Performance (f-square value 0.033) variables. In contrast, the financial regulation variables at the structural level demonstrate a relatively weaker impact on both the Financial Inclusion ( f-square value 0.018) and Business Performance ( f-square value 0.000) variables.

Tabel 6. The Result Test of f-Square

	Financial Inclusion	Business Performance	Financial Regulation	Financial Technology
Financial Inclusion		0.084		
Business Performance				
Financial Regulation	0.018	0.000		
Financial Technology	0.038	0.033		

Following the F-Square Test, the analysis proceeds to assess the significance of exogenous and endogenous variables. Each exogenous variable undergoes scrutiny to determine whether it exerts a substantial impact on the endogenous variable. The results of this significance analysis are categorized into two distinct types: direct significance, signifying direct effects, and indirect significance, denoting indirect effects. This comprehensive examination is to discern the intricate relationships and influences within the research model.

Table 7 presents the results of the direct significance (direct effect) of all exogenous variables on endogenous variables. In the case of Financial Inclusion's impact on Business Performance, the original sample data revealed a coefficient of 0.278 whereas the corresponding p-value of 0.000 significantly surpasses the conventional significance threshold of 0.05. Consequently, this affirms the hypothesis, asserting that Financial Inclusion indeed wields a substantial direct influence on Business Performance. The positive coefficient (0.278) suggests that an upsurge in Financial Inclusion correlates with a favorable change in Business Performance.

When examining Financial Regulation's effect on Financial Inclusion, the original sample data produced a coefficient of -0.130. The associated p-value, at 0.000, indicates robust statistical significance. This compellingly supports the hypothesis positing that Financial Regulation exerts a pronounced effect on Financial Inclusion. The negative coefficient (-0.130) intimates that an escalation in Financial Regulation tends to coincide with a decrease in Financial Inclusion.

As for the relationship between Financial Regulation and Business Performance, the original sample data generated a coefficient of -0.020. While the p-value of 0.007 falls below 0.05, it remains significant. This outcome signifies that the hypothesis is accepted, albeit with a somewhat reduced level of significance compared to other relationships. The negative coefficient (-0.020) conveys a relatively weaker yet still meaningful adverse association between Financial Regulation and Business Performance.

For the connection between Financial Technology and Financial Inclusion, the original sample data furnished a coefficient of 0.190. Notably, the accompanying p-value of 0.000 establishes substantial statistical significance. This compellingly bolsters the hypothesis, affirming that Financial Technology exerts a noteworthy direct impact on Financial Inclusion. The positive coefficient (0.190) suggests that an augmentation in Financial Technology is correlated with an increase in Financial Inclusion.

Similarly, when evaluating Financial Technology's influence on Business Performance, the original sample data yielded a coefficient of 0.174. The corresponding p-value of 0.000 implies robust statistical significance. This underpins the hypothesis, validating that Financial Technology indeed wields a

meaningful direct effect on Business Performance. The positive coefficient (0.174) indicates that heightened Financial Technology usage corresponds with an improved Business Performance.

Table 7. The results of the direct significance test

	Original Sample (O)	P Values	Proof of Hypothesis
Financial Inclusion -> Business Performance	0.278	0.000	Accepted
Financial Regulation -> Financial Inclusion	-0.130	0.000	Accepted
Financial Regulation -> Business Performance	-0.020	0.007	Accepted
Financial Technology -> Financial Inclusion	0.190	0.000	Accepted
Financial Technology -> Business Performance	0.174	0.000	Accepted

Thus, based on Table 7, it is proven that:

H1 = Financial Technology has proven to have a positive effect on Financial Inclusion.

H2 = Financial Regulations prove the opposite, namely a negative effect on Financial Inclusion.

H3 = Financial Technology has proven to have a positive effect on business performance.

H4 = Financial Regulations are proven otherwise, namely they have a negative effect on Business Performance.

H5 = Financial Inclusion has a positive influence on business performance

The results of the indirect significance test conducted to address hypotheses 6 and 7 is tabulated in Table 8. In the context of the relationship between Financial Regulation and Business Performance, the original sample data reveals a coefficient of -0.037. The p-value for this relationship is 0.000, signifying a high degree of statistical significance. This compellingly corroborates the hypothesis, offering substantial evidence that Financial Regulation indeed exerts a notable indirect influence on Business Performance. The negative coefficient (-0.037) implies that an escalation in Financial Regulation is associated with a decline in Business Performance.

In terms of the effect of Financial Technology towards Business Performance, the original sample data yields a coefficient of 0.052. The associated p-value, also at 0.000, indicates robust statistical significance. This firmly bolsters the hypothesis that Financial Technology has a substantial indirect impact on Business Performance. The positive coefficient (0.052) suggests that an increase in Financial Technology is linked to an enhancement in Business Performance.

Table 8. Indirect Significance Test Results

	Original Sample (O)	P Values	Proof of Hypothesis
Financial Regulation -> Business Performance	-0.037	0.000	Accepted
Financial Technology -> Business Performance	0.052	0.000	Accepted

From Table 8, hypotheses 6 and 7 are described as follows:

H6 = Financial Inclusion is a mediation that has a positive and significant influence between Financial Technology and Business Performance (H6 is accepted).

H7 = Financial Inclusion is a mediation that has a negative and significant influence between Financial Regulation and Business Performance (H7 is rejected).

## 4.2 Discussion



Based on the data from the analysis above, the influence of each variable in the context of this study can be explained as follows:

- **The Effects of Financial Technology on Financial Inclusion**  
Based on the findings in this study, it can be concluded that Financial Technology has a positive influence on Financial Inclusion of companies in the G20 countries. The findings from this study support previous studies which also stated that financial technology has a positive effect on the financial inclusion of a region.  
Findings from the CFI Team (2021) and Chatterjee (2021) state that financial technology can expand access to financial services and significantly reduce the cost of financial services. Research from Ozili (2018) discusses digital finance and its benefits for digital financial providers, the government, and a country's economy. Then Durai dan G (2019) found that financial technology provides greater control over a customer's personal finances. These findings support all three results from their research. This research also found that not only financial technology can provide financial inclusion to companies. Technology implementation in general can also provide better financial inclusion for a company. One of the questions asked in the survey was whether the company has a website and email to communicate with clients and suppliers. This research found that companies in G 20 countries, that use email and websites have better financial inclusion. It is important for the SMEs using technology in payment system or financial transaction.
- **The Effect of Financial Regulation on Financial Inclusion**  
Based on the findings in this study, financial regulation has a negative effect on financial inclusion. Previous studies discussing financial regulation and financial inclusion have had varying results between positive and negative effects. This study supports the findings of other studies which conclude that financial regulation has a negative effect on financial inclusion. Research from Mobile Money (2019) found that tightening of financial regulations can have a negative impact on financial inclusion and access to finance. However, it really depends on the approach of the regulator towards the implemented financial regulations. Research from Abor et al (2019) states that financial regulation and financial inclusion can have a positive relationship where regulation can reduce the strictness and requirements for using financial services. However, this study found that financial regulation has increased the terms and conditions for using financial services.
- **The Effect of Financial Technology on Business Performance**  
The findings from this study conclude that financial technology has a positive effect on business performance. Previous studies discussing financial technology and business performance also have the same conclusions as to the conclusions of this study. Companies that have financial technology will be able to have better business performance. There are several previous studies that support this research regarding financial technology and business performance. R.V.S.P.K et al (2020) who found that the use of financial technology is highly dependent on the digital literacy of the technology users. Then, research from Kulathunga et al. (2020) found that the use of financial technology and increased digital literacy have a significant effect on the financial performance of a business. Companies that can use financial technology and other technologies in general can improve the business performance of these companies. Research from Sajuyigbe dan Alabi (2012) and Simpson dan Boyle (2021) also found the same conclusion.
- **The Effect of Financial Regulations on Business Performance**  
This research has several findings related to financial regulations and business performance, where financial regulations have a negative influence on business performance. As with the effect of financial regulation on financial inclusion, previous studies that examined the effect of financial regulation on business performance had answers that varied between positive and negative. This study supports previous studies which provide negative conclusions about the effect of financial regulation on financial inclusion. According to research from Brock and Beer (2022), financial regulation can have a positive and negative effect on business performance. This study supports this research on the negative side, where financial regulations will hinder business activities carried out by companies. In addition, research from Banerjee and Majumdar (2018) found that financial regulation can have a significant influence on aspects of business performance such as financial efficiency, thereby having a positive influence on business performance. However, this study does not corroborate the findings of the study.

- **The Effect of Financial Inclusion on Business Performance**  
With the findings from this study, it can be concluded that financial inclusion has a positive effect on business performance. Several previous studies also have similar conclusions to this study, where financial inclusion has a positive influence on business performance. Aspects of financial inclusion can have a significant and positive influence on business performance according to research from Oranga and Ondabu (2018). The same finding is also supported by research conducted by Vitenu-Sackey and Li (2019) on countries with low per capita GDP. Research from Nova et al. (2020) show that investing in financial inclusion improves business performance and business expansion.
- **The Influence of Financial Technology on Business Performance Mediated by Financial Inclusion**  
This research finds that financial technology can also improve business performance if it is mediated by financial inclusion. In accordance with the findings from the CFI Team (2021) and Chatterjee (2021), an increase in financial inclusion can have a positive effect on financial inclusion. By increasing financial inclusion, according to research conducted by Nova et al. (2020), then financial performance can also experience an increase. From the questions given in the survey, financial technology and technology in general used by companies such as external technology and communications such as email can increase the ability of these companies to obtain financial facilities. With a company having more adequate financial facilities, the company will be able to carry out business activities better with better performance.
- **The Influence of Financial Regulations on Business Performance Mediated by Financial Inclusion**  
This study found that financial regulation has a negative effect on business performance if it is mediated by financial inclusion. In accordance with the findings from research conducted by Mobile Money (2019), if the regulator increases financial regulation, then financial regulation will have a negative impact on financial inclusion because people and organizations have to go through several regulations provided by the regulator. Therefore, communities and companies will experience obstacles in business activities, so that the business performance of these communities or companies decreases.

## 5. Conclusion

Referring to the research results above, it can be concluded:

- 1) Financial technology has a positive influence on financial inclusion in the G20 countries. Financial technology generally refers to financial facilities provided by financial organizations that use technology such as computers and mobile phone applications. With financial technology, the general public can easily access these facilities without the need to go to a bank or ATM.
- 2) Financial regulations have a negative effect on financial inclusion in the G20 countries. Tight financial regulations can prevent people from getting the financial facilities they need for their daily lives so that financial regulations can reduce financial inclusion.
- 3) Financial Technology has a positive influence on business performance in the G20 countries. The use of technology such as financial applications makes transactions and business activities faster, smoother, and more orderly. In addition, this research also found that the use of technology in general for communication media such as e-mail and websites can also make it easy for consumers to communicate and obtain information so that the company's business performance becomes better.
- 4) Financial regulations have a negative effect on financial performance in the G20 countries. All organizations and companies have to go through several types of rules and regulations that must be adhered to in order for them to run their respective businesses. However, efforts to follow the rules and comply with regulations can hamper the company's business activities so that the company will experience a decline in business performance.
- 5) Financial inclusion has a positive influence on business performance in the G20 countries. The more people and organizations that have access to financial technology and communication technology, the better the community can do business with companies so that the company's business performance is getting better. Increasing financial inclusion can provide good company performance.
- 6) Financial inclusion can be used as a mediation between financial technology and business performance where financial technology can indirectly have a positive influence on business



performance. Because financial technology provides easy access to technology-based financial facilities for the public and organizations, business activities can be carried out easily, smoothly, and quickly, so that the business performance of the company has increased.

- 7) Financial inclusion can be used as a mediation between financial regulations and business performance where financial regulations have a negative influence on business performance. With strict financial regulations, people and organizations cannot get access to financial facilities that they can use for business activities. Business performance can experience a decline due to strict regulations and people who cannot get access to these financial facilities

This research has provided valuable empirical insights into the complex dynamics of financial technology, financial regulation, and financial inclusion's influence on business performance. In particular, this study highlights the crucial role of financial inclusion as a potential mediator in the relationship between financial technology and financial regulation regarding business performance.

Furthermore, the implications of this research hold significance for companies of all sizes, spanning from small businesses to medium-sized enterprises and large corporations. By shedding light on the advantages brought forth by financial technology, financial regulation, and financial inclusion, this study aims to equip these businesses with actionable knowledge. This knowledge can then be incorporated into the formulation of effective policies and strategic frameworks, facilitating enhanced business performance. In addition, the findings of this study hold the potential to contribute to the prosperity of businesses within G20 member states, offering guidance and insights that can be harnessed to strengthen their competitive edge in the international arena in the years to come.

## **6. Limitations & Recommendations**

This research focuses on the influences between various variables, such as financial technology, financial regulation, financial inclusion, and business performance which draws upon secondary data obtained from surveys carried out by the World Bank under the banner of the annual Enterprise Survey. The secondary data derived from the Enterprise Survey encompasses a wide array of dimensions, some of which have not been included in this particular study. This comprehensive dataset provides ample opportunities for future research to explore and examine the relationships between various aspects that are included in the dataset, providing a promising avenue for further investigation.

In addition, it is important to note that this study focuses on a limited subset of G20 countries and does not encompass some of the major G20 nations, including the United States and Japan. Therefore, there is considerable potential for further advancement in this research if more G20 countries participate and if a large number of surveyed organizations provide responses to the relevant questions. Looking ahead to future research, there is an aspiration that the Enterprise Survey can offer more comprehensive insights into companies across both G20 and non-G20 countries, eventually contributing to more robust and comprehensive research outcomes.

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