Benefit and Cost Analysis of Fintech

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1. Introduction

Financial technology (FinTech) are technologies aimed at improving and automating traditional financial services. It has experienced dramatic growth in China over the past decades.

In this essay, a general analysis of FinTech's overall impact on the economy will be offered first. Then, a cost-benefit analysis of FinTech's impact on households, traditional banks, and investment opportunities will be offered along with policy recommendations aimed at maximizing the benefits and minimizing the costs.

2. Analysis of Costs and Benefits of FinTech and Policy Recommendations

2.1 Impact on Long-Run and Short-Run Economic Conditions

Overall, FinTech brings both positive and negative impacts to the economy. The impact of FinTech on short-run & long-run economic conditions will be illustrated mainly using the example of P2P lending platforms, which is a type of FinTech in which individuals lend and borrow money from each other on a digital platform without going through the bank.[1] Short-run economic growth is defined as the increase in a country's GDP within a year' time frame, and long-run economic growth is defined as sustained and persistent growth in an economy's productive capacity and overall economic wellbeing over a more extended period of time.

2.1.1 Benefit: Accessible Loans Promote Short-Run Economic Growth

FinTech can bridge financing gaps for small- and medium-sized enterprises (SMEs) that were underserved by traditional banks and foster short run economic growth.[2] Previously, it was hard for SMEs to take loans from banks as they often can't provide collateral to secure loans and the former imposes stricter requirements to assess the credit. However, with P2P platforms, the lenders are all private investors, thereby the lending processes are less regulated. This gives SMEs the opportunity to take loans from private investors on P2P platforms.[3] Evidently, in 2019, around 10 million Chinese SMEs were supported by loans offered by P2P platforms.[4] By supporting SMEs financially, P2P platforms can foster innovation, productivity, and job creation, which increases economic output and fosters short-run economic growth.

2.1.2 Benefit: New Technology as Physical Capital Promotes Long-Run Economic Growth

Incorporating new technology into factors of production increases overall economic output and promotes long-run economic growth.[5] This can be supported by the Solow-Swan model, a production function theorizing that economic output is dependent on a combination of labor, education, physical capital, and ideas. According to the model, when new technology like FinTech becomes part of the physical capital, economic output is expected to increase. Since FinTech is a revolutionary technology that pushes financial services to a new level of efficiency[6], it is able to persistently increase economic output over an extended time frame. Thus, Fintech can increase economic output and promote economic growth in the long run.

2.1.3 Cost: Fraud Threatens Long-Run Economic Well-being

The easy accessibility of digital lending comes at the risk of moral hazards.[7] Specifically because lending platforms don't have access to central bank's credit scoring system, it's harder for them to evaluate risks such as lenders' ability to pay back the loan, and they cannot conduct adverse selection in offering financial services. This flaw in managing people's credibility may result in moral hazards. For example, a P2P lending platform is a type of Fintech in which individuals lend and borrow money from each other without going through the bank.[8] Evidently, 8% of P2P users have experienced fraud worldwide in 2023, and the median monetary loss due to scam in 2022 is $176 per customer.[9] Particularly, the collapse of the Chinese P2P market in 2020 is mainly attributable to fraud.[10] The frequent occurrence of fraud can decrease consumers' wealth and confidence to take loans in the long run, which suppresses consumption. Since consumption is one of the 4 components of GDP (C+I+G+NX), this threatens long-run economic growth. In addition, frequent occurrence of financial fraud also threatens social stability and hurts economic well-being in the long run.

2.1.4 Conclusion

Overall, FinTech such as P2P lending platforms contribute to short- and long-run economic growth as it offers more accessible loans a more efficient physical capital. It may hurt the economy as it increases the occurrence of financial fraud. In the following sections, FinTech's impact on specific stakeholders will be analyzed.

2.2 Impact on Households and Policy Recommendations

2.2.1 Benefit: Enhance Household's Ability to Manage Financial Assets

The emergence of FinTech has simplified complex financial procedures into those of which households of low-to moderate-income strata can manage.[11] Such simplified procedures can improve households' financial wellbeing after retirement, as supported by the life-cycle hypothesis. The life-cycle hypothesis (Figure 1) posits that individuals endeavor to seek consumption smoothing, though the amount of saving fluctuates across distinct stages of their life cycle, particularly, decreases after retirement.[12] This suggests that retirement plans are needed to sustain such a consumption. According to the Hong Kong Trade Development Council (HKTDC), within a cohort of 1.5 million retirees in Hong Kong, a substantial segment comprising 418,000 individuals experience a dearth of liquid assets after retirement.[13] Meeting this demand, the popularization FinTech has

shaped an era wherein financial services such as retirement plans are more accessible and conveniently presented to retirees through automated interfaces[14]. Specifically, FinTech has introduced micro-investing plans, offering individuals the opportunity to systematically invest modest sums of capital[15], facilitating a disciplined savings approach that aligns with the life-cycle hypothesis. Thus, FinTech's provision of simplistic retirement plans to Low-to-Middle Income people (LMIs) serve as a mechanism to perpetuate consumption levels, particularly for those anticipating a precipitous decline in income post-retirement, thereby fostering financial resilience, liquidity, and adaptability.

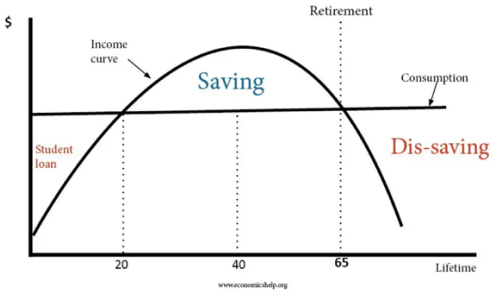

Figure 1. Lifecycle Hypothesis[16]

2.2.2 Benefit: Financial Inclusion

FinTech better distributes income and fosters financial inclusion as it makes loans more accessible to individuals. Historically, individuals with low to moderate incomes confronted challenges in securing affordable, short-term, and modest-scale personal loans from conventional banking and financial institutions, primarily due to unfavorable credit histories.[17] Nonetheless, over the past decade, the FinTech sector has emerged as a transformative force, introducing unsecured consumer loan products designed to address short-term credit needs. According to the Federal Reserve Bank of New York, the aggregate balance of unsecured personal loans, catering specifically to below-prime borrowers, escalated to a substantial $232 billion by 2023, representing a noteworthy increment of $40 billion from the preceding year.[18] This growth underscores the apparent market demand for personal loans, with FinTech playing a pivotal role in propelling this expansion. FinTech microfinance platforms have been particularly advantageous for individuals with limited income or constrained access to traditional banking credit as it lifts their credit constraints. Evidently, according to Fig. 2, which is a Chinese map showing the Digital Financial Inclusion by region in 2011 and 2018, regions with high financial inclusion (red and orange) have dramatically increased as FinTech developed.[19] This increases wealth and consumption for LMI households[20], which improves LMI demographics and generates positive distributive impacts. Thus, FinTech improves financial inclusion and better distributes income among LMI households.

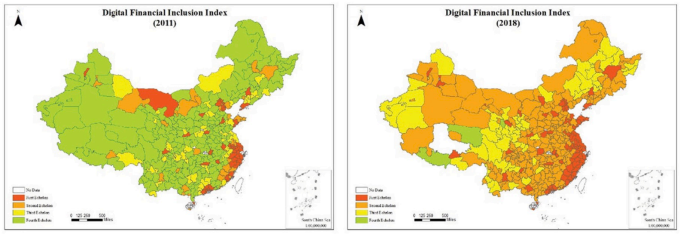

Figure 2. Map of Digital Financial Inclusion Index[21]

2.2.3 Cost: Risky Decisions of Individual Investors

As FinTech increases the accessibility to investment opportunities, individuals within the low- and moderate-income strata are offered more investing and financing opportunities, but their limited financial literacy and a propensity to succumb to the complexities of the financial landscape might lead to imprudent choices and expose them to more financial risks in autonomous decision-making.[22] As previously noted, FinTech in microfinance have spurred the participation of those with low financial credibility. Gregor Becker's study from Goethe University suggests that "Customers… with low saving balances prior to the experiment are more likely to activate the FinTech."[23] Nevertheless, an investigation by the National Institutes of Health (NIH) underscores the ambivalent and double-edged nature of FinTech: "By combing the data from the China Household Finance Survey Data and the Peking University Digital Financial Inclusion Index of China, we find that digital finance significantly promotes household participation in risky financial markets".[24] Such participation can be partially justified through behavioral economics. In the context of China's social culture, where unbridled herding behavior is pervasive and particularly evident in online communities and social media platforms, individuals are inclined to pursue the investment decisions of the mass. This herding behavior could intensify market volatility and foster speculative bubble formation, thereby adversely affecting household wealth and financial stability. In essence, individuals within the low- and moderate-income strata, representing principal stakeholders in the FinTech sector, demonstrate a susceptibility to risks in making unwise decisions as a result of both the nature of the industry, and the social context.

2.2.4 Policy Recommendations

To maximize the benefits of FinTech, its use will continue to be encouraged along with the following measures that tackle the problem of individuals' risky decisions.

Policy Set 1: Targeting Consumer Behavior

1. Promoting and Enhancing Financial Education Programs: By implementing more financial literacy programs targeting households within the low- and middle-income strata, these populations will acquire the capacity to thoroughly assess the components of an investment plan, leading to more informed autonomous decision-making. In specific, these programs should concentrate on cultivating awareness regarding investment risks, comprehending emerging financial products, evaluating potential benefits and

risks, fostering cybersecurity awareness, and making judicious decisions. For example, encouraging the development of financial literacy programs that offer financial counseling and education services on debt management, budgeting, and credit. Notable organizations in this domain include the US Financial Literacy and Education Commission (FLEC) and the National Foundation for Credit Counseling (NFCC).

2. Establishing and Reinforcing Behavioral Economics Interventions: The adverse repercussions of Herd Behavior can be mitigated through the implementation of behavioral policies aligned with the economic concept of Nudge Theory. This theoretical framework posits that consumers maintain their consumer sovereignty but are nudged toward making better decisions through choice architecture.[25] For instance, leveraging the Inertia Bias fallacy—the propensity to maintain the status quo—can be instrumental in defaulting to safer investment options or automatic savings preferences that guide users toward prudent financial choices. This approach reduces the likelihood of impulsive or herd-driven behavior. Furthermore, herd behavior can be strategically harnessed for the household's advantage. As proposed by the Communist Party of China News Online, the government should assume the role of the "Flock Queen," establishing dedicated departments to guide LMIs to effective financial counseling through small platforms.[26] In China's mixed economy, prudent government intervention stands as a viable strategy to mitigate information asymmetry in financial transactions, thereby contributing to the overall efficiency of markets.

Policy Set 2: Regulatory Safeguards

1. Institute and fortify regulatory frameworks that adhere to strict consumer protection standards: These frameworks encompass a dualistic approach, spanning both international and domestic. AML and KYC regulations, aiming to prevent money laundering and fraud, are executed via customer verification protocols and vigilant monitoring for suspicious activities. At the domestic level, regulatory agencies play a pivotal role in reinforcing activity-based and entity-based regulations, permitting a targeted risk mitigation approach, thereby contributing to the preservation of stability and integrity within the FinTech industry. It is, however, noteworthy that this approach, while efficacious, may be perceived as possessing a potential drawback—a one-size-fits-all perspective that might inadvertently overlook the nuanced and individualized needs of households.
2. Buttress consumer protection standards: by enforcing these regulations, spending capacity of individuals shall be limited, ultimately reducing risk, and assuring a degree of financial volatility. This entails transparent disclosure of risks associated with financial products and services, as well as measures to prevent predatory lending and unethical practices. In addition, it is recommended to adopt transaction limits on financial platforms for the sake of consumer protection. For instance, platforms such as WeChat implemented transaction caps of 200,000 RMB per day for payment accounts linked to personal ID cards.[27] While such limits serve to alleviate potential financial burdens on individuals, they limit household consumption.

Policy Set 3: Enforce Non-Credit Requirements for Microfinance Loans

1. In light of the prevailing financial literacy challenges within low- to moderate-income households, it is recommended to institute supplementary regulatory measures, criteria, and prerequisite assessments before granted access to microfinance or payday loans. These investment opportunities essentially expose themselves to a riskier consumer population; therefore, accentuating and reinforcing alternatives, specifically those grounded in cash-flow-based underwriting, would yield mutual advantages. For one, it serves to alleviate concerns within in low- to moderate-income households with less financial awareness in adopting unwise decisions; for another, it operates as a risk-mitigation strategy, screening out potential investors lacking the financial capacity to navigate these instruments and reducing the likelihood of insolvency.

2.3 Impact on Traditional Banks and Policy Recommendations

2.3.1 Benefit: Broadened Reach of Traditional Banks and Enhanced Customer Acquisition

The complementarity hypothesis posits that conventional banks form strategic partnerships with FinTech enterprises or cultivate their own FinTech solutions to target an untapped customer base, thereby expanding their loan portfolios and increasing non-interest income streams.[28]

Through strategic partnerships, FinTech has broadened the reach of traditional banks and enhanced customer acquisition. Findings presented in Table 1 disclose a statistically significant positive coefficient of 0.128 for the t.1 indicator, indicating a notable increase in combined personal loan offers and credit card offers.[29] Isolating personal loan and credit card offerings individually unveils equally noteworthy findings, demonstrating a significant positive coefficient for the t.1 indicator, with a positive coefficient of 0.161 for personal loan offerings and 0.142 for credit card offerings. These results consistently indicate a shift in post-partnership bank behavior, with a higher likelihood of offering credit cards and personal loans to borrowers with below-prime credit.[30]

2.3.2 Benefit: Partnership Increases Profitability

Studies indicate that partnership with FinTech may bring potential positive effects on traditional banks' interest income. Research by the IMF has shown that there is a positive correlation between FinTech and non-interest income (as shown in Figure 2). The estimated coefficients

show that for every 1 percentage point increase in FinTech transaction volume, the non-interest income of existing financial institutions increases by 0.01 percentage points.[31] This finding implies that intense competition from FinTech firms has prompted traditional financial institutions to seek alternative sources of revenue, particularly through fees and commissions.

Table 2. Effect of FinTech on Bank Performance Measures

	(1) ROE	(2) ROA	(3) NIM	(4) NONIC	(5) CTI
FinTech	-0.0903***	-0.0246***	-0.0277***	0.0111***	0.136***
	(0.0113)	(0.00233)	(0.00340)	(0.00338)	(0.0292)
Size	3.212***	0.730***	-0.0992	-0.515***	-9.447***
	(0.418)	(0.0883)	(0.128)	(0.151)	(1.220)
Equity-Asset ratio	0.110***	0.0434***	0.0380***	0.0169**	-0.0994*
	(0.0217)	(0.00539)	(0.00955)	(0.00666)	(0.0521)
GDP growth	0.229***	0.0360***	0.0389***	0.0107**	-0.412***
	(0.0155)	(0.00330)	(0.00553)	(0.00468)	(0.0371)
Inflation	-0.186***	-0.0569***	-0.0486**	0.0260	-0.140
	(0.0534)	(0.0117)	(0.0210)	(0.0188)	(0.100)
Policy rate	0.242***	0.102***	0.193***	0.00732	-0.550***
	(0.0426)	(0.0107)	(0.0220)	(0.0151)	(0.0756)
Concentration	-0.00655	-0.00309*	0.00413	0.00966***	0.0768***
	(0.00825)	(0.00183)	(0.00344)	(0.00258)	(0.0188)
N	79523	79701	79438	79666	79384
rho	0.680	0.776	0.910	0.912	0.757

Source: Authors calculations
Notes: Standard errors in parentheses
*, **, and *** denote statistical significance at 10, 5, and 1 percent level, respectively.

Variable	Mortgage Offers	Personal Loan Offers	Credit Card Offers	Personal Loan & Credit Card
(Intercept)	0.227483	-12.3009	-0.95162***	-0.94522***
	(0.801893)	(187.314)	(0.07968)	(0.07915)
t.1	0.085954	0.1607**	0.1423***	0.12778***
	(0.115031)	(0.0625)	(0.02466)	(0.02249)
year2017	-0.00653	-0.3267	0.12578***	0.10876**
	(0.568126)	(1.234)	(0.04538)	(0.045)
year2018	-0.29694	-0.2854	0.14003***	0.11154**
	(0.573886)	(1.2276)	(0.04948)	(0.04752)
year2019	-0.38891	-0.5772	0.30659***	0.15748***
	(0.565466)	(1.2272)	(0.04544)	(0.04443)
year2020	-0.2418	-0.3197	0.1481***	0.14165***
	(0.557537)	(1.2301)	(0.04933)	(0.04822)
year2021	0.073895	-0.5662	-0.42409***	-0.411***
	(0.632435)	(1.6844)	(0.08048)	(0.07973)

Figure 3. Effect of FinTech on Bank Performance Measures[32]

2.3.3 Cost: Competition Causes Low Profitability

On the other hand, though partnering with FinTech may increase income, the heightened competitive landscape posed by FinTech companies challenge traditional banks in reducing deposit and loan activity, thereby resulting in low profitability and stability.[33] The estimated coefficients suggest that a marginal increase of 1 percentage point in FinTech transaction volume leads to a 0.09 percentage point decrease in return on equity (ROE) and a 0.02 percentage point decrease in return on assets (ROA) for conventional banks.[34] These effects attain statistical significance, particularly when juxtaposed against the median values of ROE and ROA within our sample, which stand at 4.2 percent and 0.5 percent, respectively.[35] Furthermore, a study discerns a statistically significant negative impact on the net interest margin (NIM). The estimated coefficients suggest that each 1 percentage point increase in FinTech transaction volume leads to a 0.03 percentage point decrease in the net interest margin of incumbents.[36] This effect is noteworthy, especially given the average growth rate of FinTech transaction volumes of 70 percent over the period 2012-2020.[37] For instance, in the context of China's banking sector, the total number of commercial bank outlets that have ceased operations since 2022 have surpassed 2,600, according to data from the Silver Circulation License Information Inquiry System.[38] From 2023, 119 state-owned outlets closed, 24 joint-stock outlets closed, and 42 city commercial bank outlets closed.[39] This underscores the intricate challenges that traditional banks face amid the swift proliferation of FinTech competition, imposing considerable pressure on their revenue streams.

2.3.4 Evaluation: Overall Profit Decreases

While collaborative endeavors with FinTech entities may present opportunities for traditional banks to augment their non-interest income, this effect is relatively insignificant compared to the median value of NONICs (1.99%).[40] This suggests that while traditional banks have made efforts to diversify their revenue streams, the positive impact of fintech on non-interest income has not fully offset the profitability challenges posed by competitive fintech pressures.[41] Therefore, it is suggested to implement policies that may increase the profitability of banks.

2.3.5 Policy Recommendations

The following policies aim at increasing traditional banks' profitability with the presence of FinTech.

1. Establishing a more comprehensive assessment and revision of licensing regulations on FinTech may reduce their competitive pressures on traditional banks. Measures should also be instituted to fortify the regulatory framework and supervision of smaller, less technologically savvy banks, which may be at higher risk of competition from fintech firms. The findings displayed in Figure 4 indicate that when stronger policy frameworks are in place, increased FinTech activity may be linked to reduced levels of risky behavior. In addition, it should be noted that China has a wide variety of fintech types and an abundance of enterprises. The nuanced nature of each fintech category necessitates distinct and tailored management measures to optimize policy efficacy. However, the current policy does not classify, customize, and design corresponding policies in response to specific types of FinTech companies, potentially resulting in low effectiveness of the policy. Therefore, policies should be categorized and specified for different types of FinTech.

Policy Framework	βFinTech (Below median)	βFinTech (Above median)
Supervisory Index	-0.0227**	0.00313
	(0.00958)	(0.0101)
Regulatory Capital	-0.0226**	-0.00865
	(0.00961)	(0.0167)
Activity Restriction	-0.0287**	-0.0209***
	(0.0152)	(0.00791)
Multiple Supervisory Agencies	-0.0227***	0.0781***
	(0.0075)	(0.0328)

Source: Authors calculations
Note: *, **, and *** denote statistical significance at 10, 5, and 1 percent level, respectively.

Figure 4. Effect of FinTech on Risk Taking Based on Selected Policy Frameworks[42]

2. Provide financial incentives or funding support to encourage partnerships between P2P fintech platforms and traditional banks. This could include offering

subsidies, grants, or low-interest loans to facilitate joint projects or initiatives. Specifically, partnering with cooperative banks is more preferrable than cooperating with shareholder-based commercial banks. According to research by the International Monetary Fund (IMF), the impact of FinTech (such as P2P lending and balance sheet lending) on banks suggest that cooperative banks are more susceptible to declining profits. In contrast, larger and more sophisticated commercial banks manifest a relatively advantageous stance, as evident in the non-interest income streams. This implies that commercial banks may be more profitable by partnering with P2P platforms.

2.4 Impact on Investment Opportunities and Policy Recommendations

2.4.1 Benefit: Information Symmetry and User-Centered Service Gives Rise to Cost-Effective Investments

FinTech creates opportunities to improve efficiency in investment as it enhances information symmetry between banks and enterprises, which is one of the determining factors of investment efficiency.[43] Specifically, banks can utilize two major fields of FinTech—big data and AI—to obtain comprehensive user information, achieving information symmetry. As a result, information symmetry improves investment efficiency by reducing deviations from optimal investment levels. According to a study by Haitao Si from Wuhan university, statistics show that "the higher the FinTech development level, the higher the efficiency of enterprise investment". Therefore, FinTech gives rise to a more efficient approach in investment.[44]

2.4.2 Benefit: Quant Finance Uncovers Ideal Investment Opportunities

Quant Finance is a type of FinTech that offers an opportunity to revolutionize investment decisions. It is a new mathematical branch of management that assesses investment opportunities via a through a fusion of empirical analysis and mathematical modeling. The transformative prowess of quant finance lies in its capacity to embed investment analysis into the domains of programming and artificial intelligence (AI). Quant finance provides a nuanced and data-driven comprehension of market trends and conditions, thereby able to efficaciously analyze and judge the market, uncovering niche investment opportunities.[45] This effective analysis of investment opportunities can improve the return on investment. Evidently, Morgan Stanley announced that quantitative strategies brought a "healthy positive total $_{\text{return}}$ of 3.9%", which is impressive in a "difficult market environment".[46] Therefore, quant finance, as a type of FinTech, can uncover new investment opportunities that are financially optimal for investors.

2.4.3 Cost: Speculation of Individual Investors Incurs Loss

Fintech such as digital investment tools provides individual investors with increased opportunities for speculative trading, potentially incurring significant losses and aggravating market volatility. As individual investors are granted easier access to investments and exposed to abundant online advice, they tend to make speculative investment decisions, which is the act of investing at a risk of losing value while expecting a significant gain.[47] This is especially true for individuals who lack knowledge and education on investments, as mentioned in section 2.2.3. For them, speculation may incur a significant loss. For example, market manipulation is a crime where a manipulator takes advantage of individual investors' speculative tendencies and artificially affects the price of securities to deceive individual investors.[48] Victims of market manipulation may bear serious financial losses, as did the victims in a crime case in 2022 where 8 men were indicted for $114 million crime.[49] Even if market manipulation doesn't take place, studies show that speculative behaviors aggravate market volatility[50], and, according to the center for global development, high macroeconomic volatility is associated with a high rate of crisis.[51] Thus, individual investors' speculation is generally undesirable considering their own wealth and the economy's volatility.

2.4.4 Policy Recommendation

To maximize the benefits of FinTech, its use will continue to be encouraged with attention to minimize the downsides. To minimize the consequences of speculation and avoid market volatility, strict regulations on the prohibition against financial crime and market manipulation should be enhanced. Imposing like the current Regulation of Market Abuse (MAR), which defines and prohibits market manipulation, is suggested. In addition, current domestic policies which support accurate, transparent, and efficient market surveillance systems should be fortified. However, it is imperative to consider the concern on how these strict regulations might conversely, hinder economic growth as they may discourage investments if implemented wrongly.

3. Conclusion

In conclusion, FinTech has both positive and negative impacts on the overall economic conditions, households, traditional banks, and investment opportunities. To maintain the existing benefits of FinTech such as improved efficiency and accessibility of financial services, its use should be encouraged in the future. Meanwhile, to minimize the problems caused by FinTech such as imprudent investment choices, banks' decreased profitability, and market volatility, aforementioned policies should be implemented to guarantee the healthy use of FinTech.

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