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Study on Model for Protection of the Customer Fund in Big-tech

빅테크 내 고객자금 보호 모델에 관한 연구

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Contents

1. Introduction	1
2. Rising of Big-tech in Payment Market	2
2.1. Payment Services of Big-tech	2
2.2. DNA Loop of Big-tech Platform	2
2.3. Impact on Banking Industry	4
2.4. Payment Big-techs of Korea	6
3. Big-tech Payment and Consumer Protection	8
3.1. Increase of Fund managed by Big-tech	8
3.2. Wircard Case	9
3.3. Big-tech Regulation of China	10
3.4. Big-tech Regulation of Korea	11
4. A Protection Model for the Customer Fund in Big-tech Platforms	14
4.1. Need for Big-tech's Customer Fund Protection Model	14
4.2. Suggestion of a Big-tech's Customer Fund Protection Model	14
References	17

1. Introduction

With the advent of the fin-tech era, big tech platforms are jumping into the financial market. In some countries, like China, the big tech platforms are already dominating the whole financial market. Their power in the financial market will get stronger and will change the basic structure of the market. The financial services of the big tech platforms give us various benefits. In particular, they are making a big contribution to financial inclusion for un-banked people in developing countries. However, they are also giving us big challenges to privacy and consumer protection. They can cause significant economic damage and undermine the stability of the financial market. So, now many people are talking about the need to regulate big tech finance.

The purpose of this study is suggest a model for protection of the customer fund managed by big-tech platforms. This study is composed of four parts: Introduction, Rising of big-tech in payment market, Big-tech payment and consumer protection, and A protection model for the customer fund in big-tech platforms. After the introduction, in the second part, Rising of big-tech in payment market, we will review the payment services offered by big-tech platforms, study the concept of DNA loop of big-tech platform, discuss impact on banking industry, and introduce payment big-techs of Korea. In the third part, big-tech payment and consumer protection, we will review the recent phenomenon of increasing fund managed by big-tech platforms, study Wirecard case happened in 2020, and discuss big-tech regulation of China and Korea. In the last part, a protection model for the customer fund in big-tech platforms, we will discuss the need for big-tech's customer fund protection model, and finally suggest a big-tech's customer fund protection model.

2. Rising of Big-tech in Payment Market

2.1. Payment Service of Big-tech

Nowadays, a lot of big tech companies are offering financial services. For example, the big 4 platform giants in USA, Google, Apple, Facebook, and Amazon, also called as GAFA, are providing financial services. In China also, IT giants, including big 3, Baidu, Alibaba, and Tencent, also called as BAT, are offering a variety of financial services. Interestingly, all of them are offering payment service without exemption. They must think payment is the most basic first step to jump into the financial market.

< Table-1. Financial Services offered by Big-tech >

Big tech	Main business	Banking*	Credit provision	Payments	Crowd-funding	Asset management	Insurance
Google	Internet search/advertising	✓*		✓			
Apple	Tech/producing hardware			✓			
Facebook	Social media/advertising			✓			
Amazon	E-commerce/online retail		✓	✓	✓		✓
Alibaba (Ant Group)	E-commerce/online retail	✓	✓	✓	✓	✓	✓
Baidu (Du Xiaoman)	Internet search/advertising	✓	✓	✓	✓	✓	✓
JD.com (JD Digits)	E-commerce/online retail	✓	✓	✓	✓	✓	✓
Tencent	Tech/gaming and messaging	✓	✓	✓	✓	✓	✓
NTT Docomo	Mobile communications	✓	✓	✓	✓		
Rakuten	E-commerce/online retail	✓		✓		✓	✓
Mercado Libre	E-commerce/online retail		✓	✓		✓	

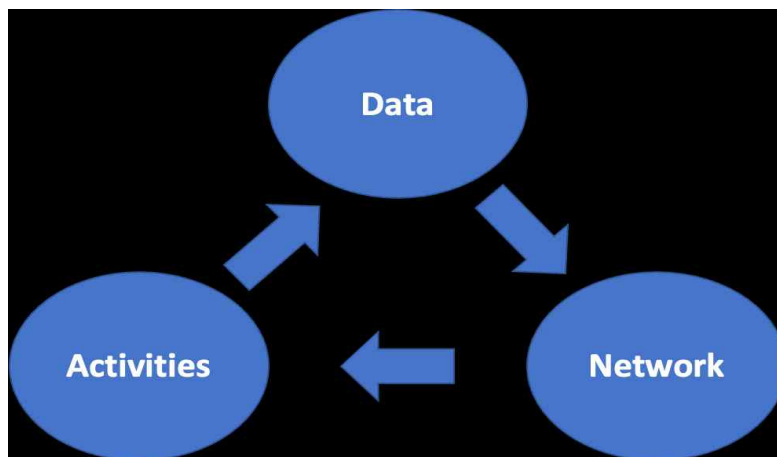
* Source: BIS Report(2021), "Big techs in finance"

2.2. DNA Loop of Big-tech Platform

The reason how they can enter the financial market so easily is the DNA loop of Big-tech platform. When a platform has many users, it can collect

a huge amount of customer data. Using the big customer data, it can spread the new services into its wide network. And the wide network facilitate its' user's activities for the new service. Finally, the new activities provide new customer data again.

< Figure-1. DNA Loop of Big-Tech >

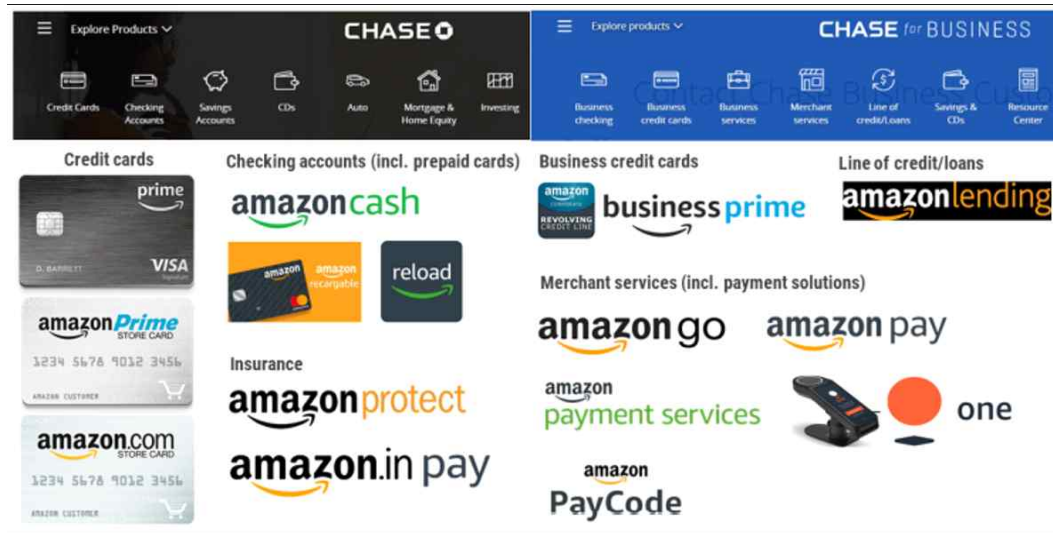


For example, when a big-tech platform provides payment service to its users, it can collect a huge amount of customer data from the payment service. By analyzing the data, it can create another related services like asset management. Then it spreads the new service through its wide network, and now the users do not afraid to do the new activity, because they already have similar experience in payment service. Now, it collects more data from the new asset management service to find another new service.

The most representative case is Amazon. People have known Amazon as one of the biggest on-line shopping platform. However, it is not just on-line shopping platform anymore. Now, we can call it as a bank at the same time, because they are offering almost all services of commercial banks, such as credit cards, checking accounts, insurance,

even lending to business. It has been expanding their financial services step by step using DNA loop.

< Figure-2. Financial Services of Amazon >



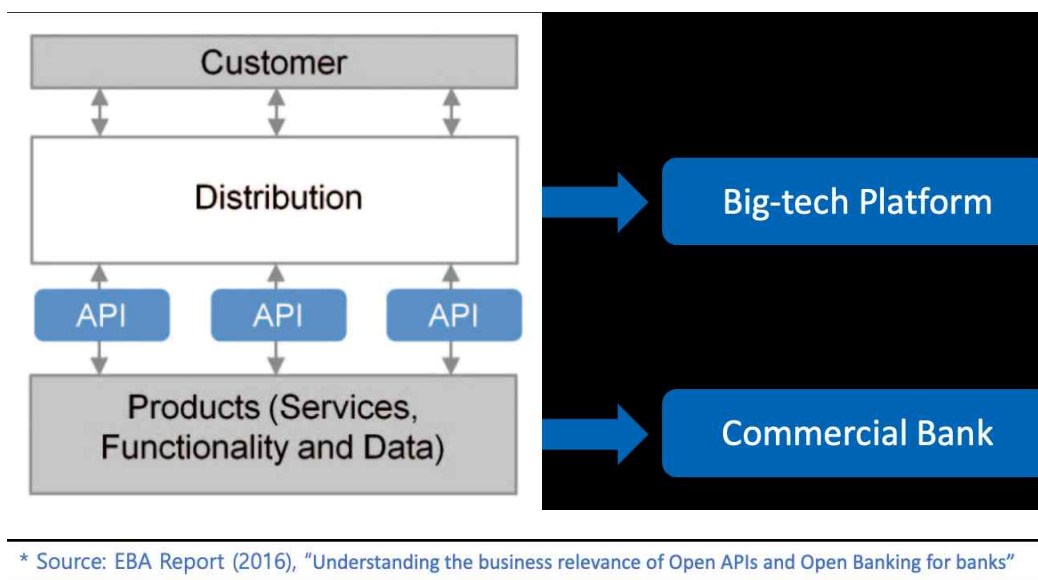
* Source: CBINSIGHT Report(2021), "Everything you need to know about what Amazon is doing in financial services."

2.3. Impact on banking industry

Bill Gates told "Banking is necessary, but banks are not.", and it has been realized. As we see in Amazon case, the big-tech platforms are providing the almost all services of commercial banks. Now, Commercial banks have no choice but to compete with the big-tech platforms in the same market.

Not only that, with the introduction of open banking, Commercial banks are mandated to share their customer data and service functions with third party service providers through APIs. As a result, there is a high possibility that the big tech platforms will take the distribution channel of financial products from commercial banks. In this case, commercial banks probably will be subordinate to the big-tech platforms.

< Figure-3. Impact of Open Banking to Banking Industry >









In China, this impact already changed the market structure. When we compare the number of Monthly Active users of mobile application, We Chat pay and Alipay, the top two payment service providers based on the big-tech platforms, Tencent and Alibaba, have 900 million and 800 million users, respectively. However, major commercial banks, such as Industrial Commercial Bank of China, China Construction Bank, and Agriculture Bank of China, have around just 300 million users. As a result, the two big-tech giants are taking 94% of mobile payment market share together. In addition, market penetration rate of Wechat Pay is 84%. It means 84% of people who use mobile phone in China is using We chat pay.

The more serious threat to Chinese commercial banks is that the mobile payment adoption rate in China is 39.5%. It is absolute No. 1 in the world. In other words, four out of 10 payments in China are mobile payments. And most of them are paid through either Alipay or We chat pay. Like Amazon, they are expanding their business areas to all financial services. In this situation, commercial banks may have no choice but to

connect to the big tech platforms to sell their products in the market. It might be the only way for survival.

< Table-2. Top 2 Payment Big-techs in China >

	WeChat Pay	vs	Alipay
Share of China's mobile payment market	 39.5 %		54.5 %
Market penetration rate	 84.3 %		62.6 %
Number of supported currencies	 13		27
User fees	 0.1% for withdrawals over RMB 1,000		 0.1% for withdrawals over RMB 20,000
Supported devices	 Devices that support WeChat		ALL phones, tablets and PCs

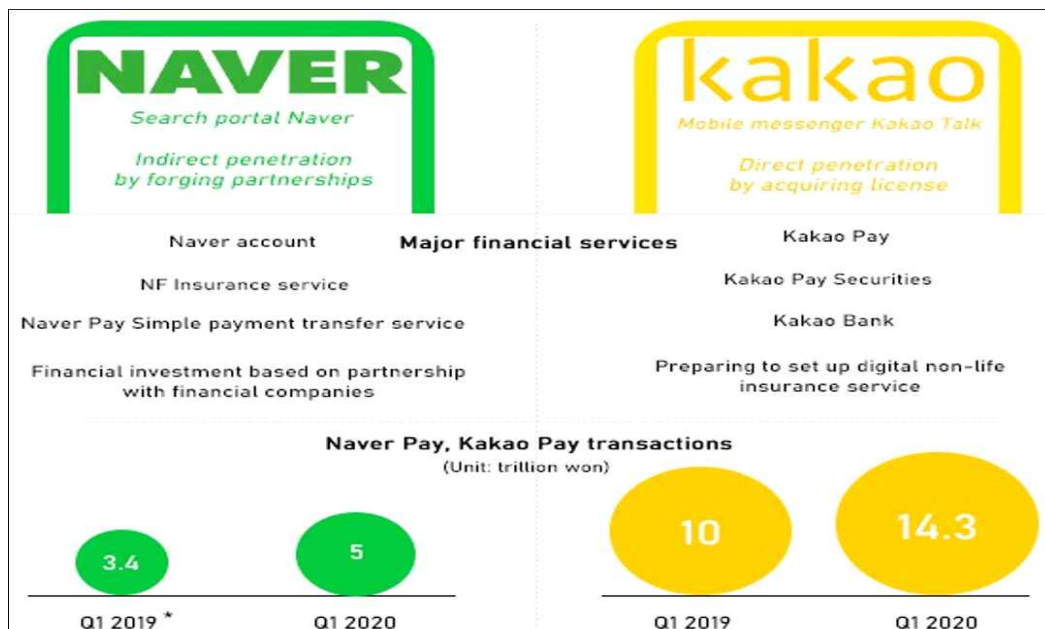
* From, <https://www.eastwestbank.com/ReachFurther/en/News/Article/WeChat-Pay-and-Alipay>

2.4. Payment Big-techs of Korea

Korea is one of the most banked country in the world. Each adult has more than 5 bank accounts and 3 credit cards on average. Nevertheless, mobile payments are rapidly increasing. As a result, fierce competition is taking place between commercial banks and fin-techs in mobile payment market. Major Korean commercial banks have been very active in developing mobile services, and they have been provided mobile payments since the early 2010s, even earlier than fin-tech companies. However, since the mid-2010s, non-financial institutions have been increasing their market share very fast.

Among them, there are two gigantic mobile payment service providers based on Big-Tech platforms. The one is Naver Pay based on Naver, which is the No. 1 search portal in Korea, The other one is Kakao Pay based on Kakao Talk, which is No. 1 messenger in Korea.

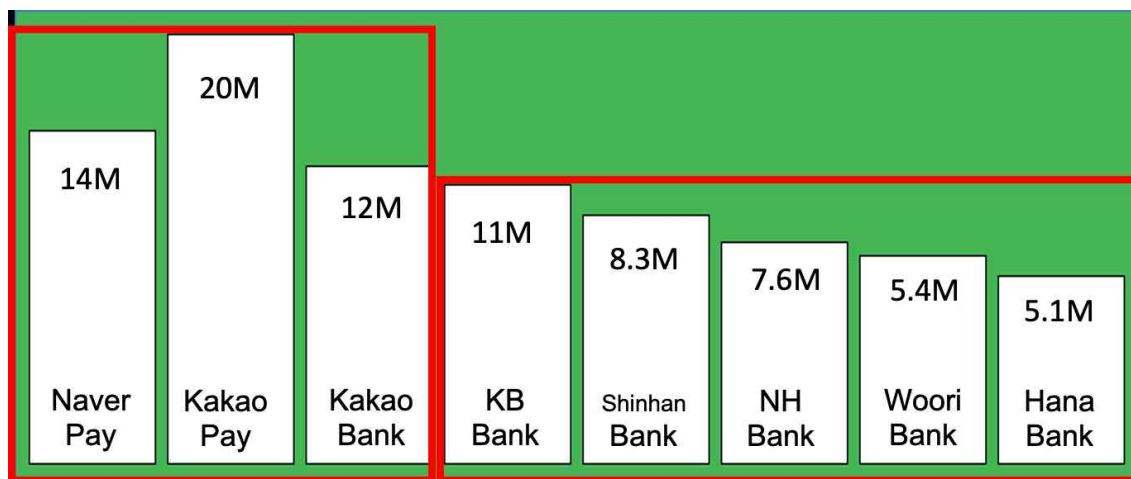
< Figure-4. Top 2 Big-tech payments of Korea >



* From, <https://pulsenews.co.kr/view.php?year=2020&no=716023>

Naver can be said as Google in Korea. Since its launching in late 1990s, it has been keeping No. 1 in Korea, although competition with Google Korea is going tough. Naver's mobile application has 30 million users. Naver Pay runs directly at this application. Users usually deposit money into their e-money account and use the e-money in both on-line and off-line. To make an offline payment, they activate an QR code at the application. Kakao talk is dominant No.1 messenger in Korea. Kakao talk messenger has 36 million users in Korea. Kakao Pay runs directly at this app. Users can send money to another kakao talk user through this app. They can also make a payment in both on-line and off-line.

< Figure-5. Monthly Active Users of Banking Applications in Korea >



* Source: KFTC Magazine (2021), "Payment Insight No.3"

Korea also shows the platform effect of big-tech payments. The applications based on the big platforms have much more users than commercial banks. Major commercial banks in Korea have been making best efforts to win the war in the mobile payment market, but it is not enough. This is because they do not have an on-line platform that can connect with their customers at all times.

3. Big-tech Payment and Consumer Protection

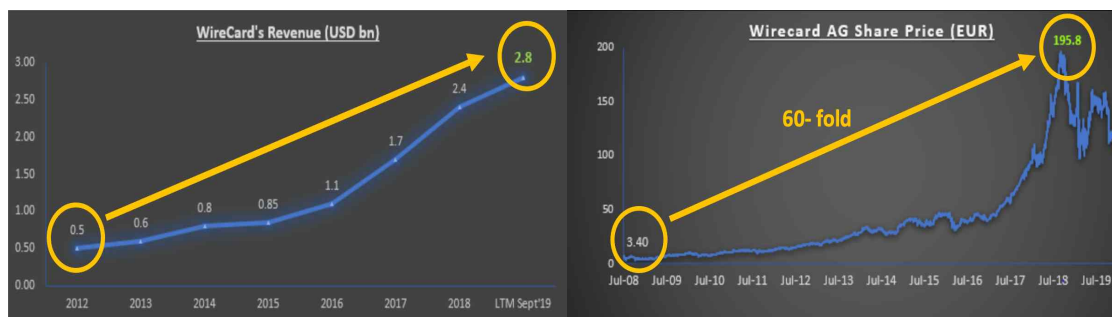
3.1. Increase of Fund managed by Big-tech

Not surprisingly, big-tech platforms have become the largest companies in the world. Big techs like Google, Apple, Facebook and Amazon in US, and Alibaba and Tencent in China, have much more market capitalizations than the largest banks in the world. Not only that, the size of funds managed by big-techs is also increasing rapidly. As of June 2020, Ant Financial Group, which is running Alipay, is managing 600 billion USD of assets, which is more than most countries' government annual budgets.

3.2. Wirecard Case

If any big-tech goes bankrupt one day, what will happen to the big-tech's customers? Wirecard is a fintech company that was founded in Germany in 1999, and became one of the most representative big tech of Germany, by providing contactless payment service to hundreds of thousands of merchants. Since 2012, along with the global fin-tech growth trend, wirecard also had been growing very rapidly. It's revenue in 2012 was 0.5 billion USD, but it increased by almost six times for 7 years. Over 10 years since 2008, Wirecard's stock price skyrocketed more than 60-fold.

< Figure-6. Rapid Growth of Wirecard >



* From, <https://www.televisory.com/blogs/-/blogs/wirecard-ag-scandal>

In June of 2020, the stock price of wirecard dropped from \square 104.5 Euro to \square 1.3 Euro over just 10 days. Shareholders of the company lost over 98% of their investment for the just 10 days. The problem was 2.98 billion dollars disappeared. It was on the balance sheet, but nobody could find the money from the real account. Finally, the company admitted that the money does not exist. Actually, it was a fraud. June 23 of 2020, CEO Markus Braun Arrested, and two days later, wiredcard filed for insolvency. The Wirecard case let us know "No big tech is too big to fail." Now, more people are talking about the need for big tech regulations.

< Figure-7. Stock Price of Wirecard in 2020 >



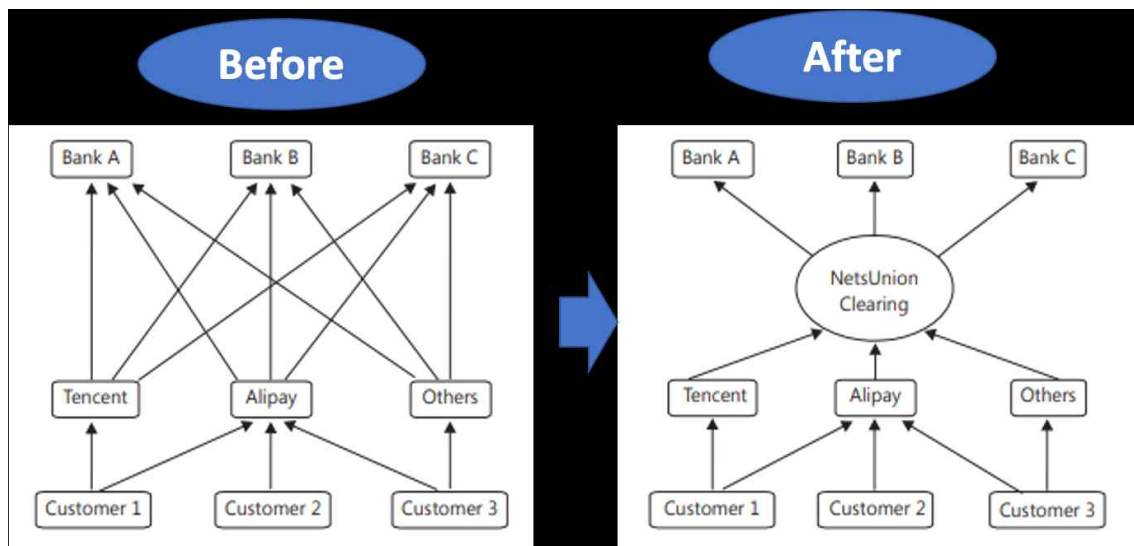
3.3. Big-tech Regulation of China

When it comes to big tech regulation, China is leading the way. There might be various reasons, but it cannot be denied that it contributes to consumer protection a lot in China. Peoples Bank of China, which is the central bank of China, introduced new regulations on big-techs in 2018. First, big techs must keep 100% of customer balances in a reserve account managed by the Central Bank. Second, all mobile payment transactions must be routed through central clearing house NUCC or Nets Union Clearing Corporation. Third, the data collected by mobile payment platform must be sent to the clearinghouse. Lastly, the central bank has the right to inspect, in order to identify and investigate fraudulent or illegal activities occurring over the mobile payment platforms.

Among them the central clearing system is the most strong tool to keep the whole payment market safe and stable. Before the introduction of this system, mobile payment platforms such as Alipay and WeChat Pay internally processed the clearing. So, nobody could see what is happening

inside the platforms. However, after the introduction of this system, all transactions are recorded and cleared by Net Union Clearing Corporation, and it enhance transparency and help protect the customer's fund in case of emergency.

< Figure-8. Central Clearing System in China >

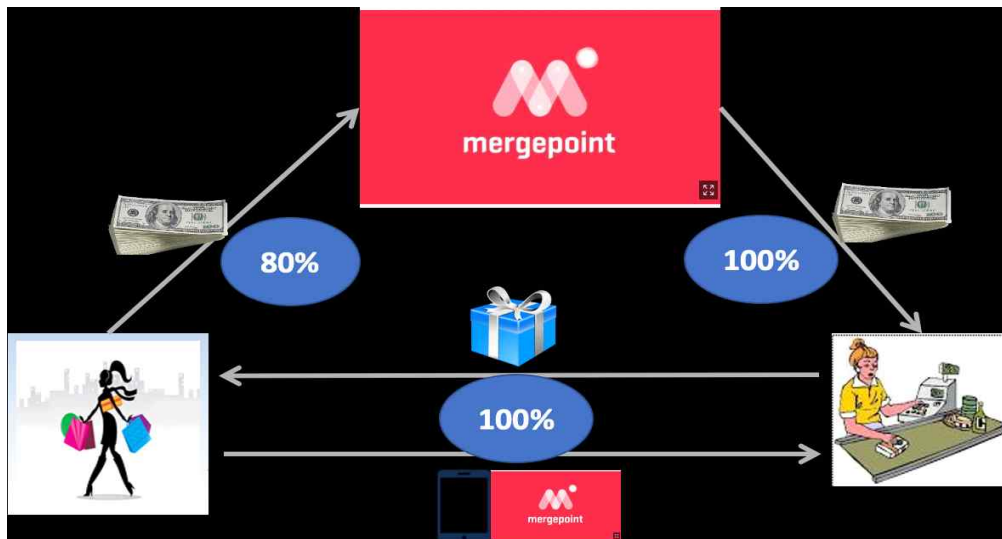


* Source: BIS Report (2019), "Big tech in finance: opportunities and risks"

3.4. Big-tech Regulation of Korea

Korean government's standpoint on fintech was to reduce regulations as much as possible to ensure creativeness. However, since the Merge Point crisis in 2021, there have been growing calls for stricter fin-tech regulations. In 2021, Merge Point made a big controversy about regulation on fin-tech industry. Merge Point is a type of mobile voucher that is sold at discount rate. It attracted customers by offering an unprecedented large discount rate. If you buy a mobile voucher at 80% of the face value, you can use it at 100% of face value like cash at franchises and local merchants. Finally, the company deposit the money into the merchant's account.

< Figure-9. Business Structure of Merge Point >



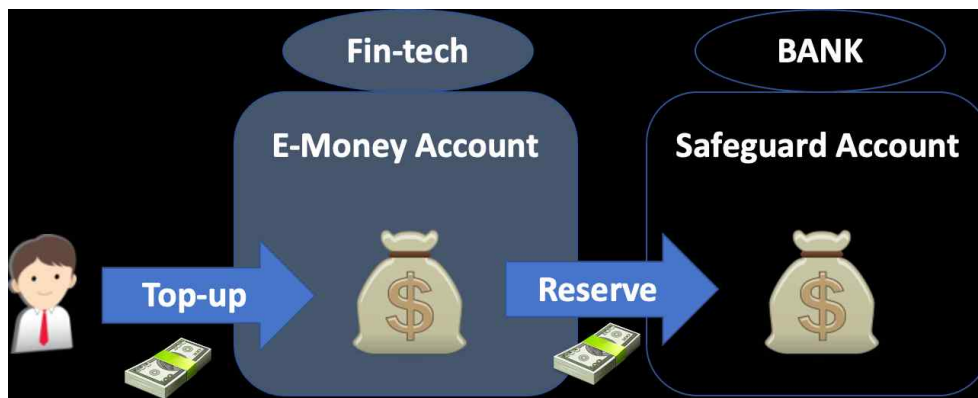
As of July 2021, it was estimated to have 1 million users and 80 thousands merchants. On August 11, 2021, it noticed service reduction, sales/refund suspension, and then bank run to Mergepoint happened. Customer's damage is estimated up to 200 billion Korean won. The Mergepoint triggered the discussion on the urgency of legal protection for fin-tech's customer deposits. Actually, the amendment of EFTA or Electronic Financial Transaction Act has been under process since 2020. And it contains legal measures to strengthen the protection system on customer's fund in fin-techs, and it has 3 measures: safeguard account, central clearing, preferential reimbursement right.

3.4.1. Safeguard Account

When customers top up their cash into their e-money account for mobile payment, The fin-techs used to operate the customers' deposits to generate their own profits. However, under the new regulation, the fin-tech companies must keep safeguard account in other financial institutions

separately, and reserve the customer's deposit in the safeguard account. With this measure, we can protect the customer's money even in case of the fin-tech's bankruptcy.

< Figure-10. Basic Concept of Safeguard Account >



3.4.2. Central Clearing

Currently, fin-tech companies are processing the payment transactions through the private network with banks. So, nobody knows what is happening during the payment process, and it can be used for money laundering. However, under the new regulation, the payment transactions must be cleared and settled through the central clearing system, and the transaction history is recorded in the clearing house. It will enhance transparency and safety of the whole system, not to mention helping protection of the customer's deposit in case of emergency like fin-tech's bankruptcy.

3.4.3. Preferential Reimbursement Right.

The the preferential reimbursement right, the customer's fund in e-money account of fin-techs could be protected from all other legal actions. So,

even in emergencies like fin-tech's bankruptcy, customers can cash out their deposits prior to other creditors.

4. A Protection Model for the Customer Fund in Big-tech Platforms

4.1. Need for Big-tech's Customer Fund Protection Model

Payment transactions within big-tech platforms are managed in internal ledgers, and actual transaction processing uses their corporate-named accounts, making it impossible to trace the transaction history and current status of the consumers' fund from outside. In addition, big-tech payments have a relatively lower level of supervision than financial institutions, making it difficult to trust its internal process.

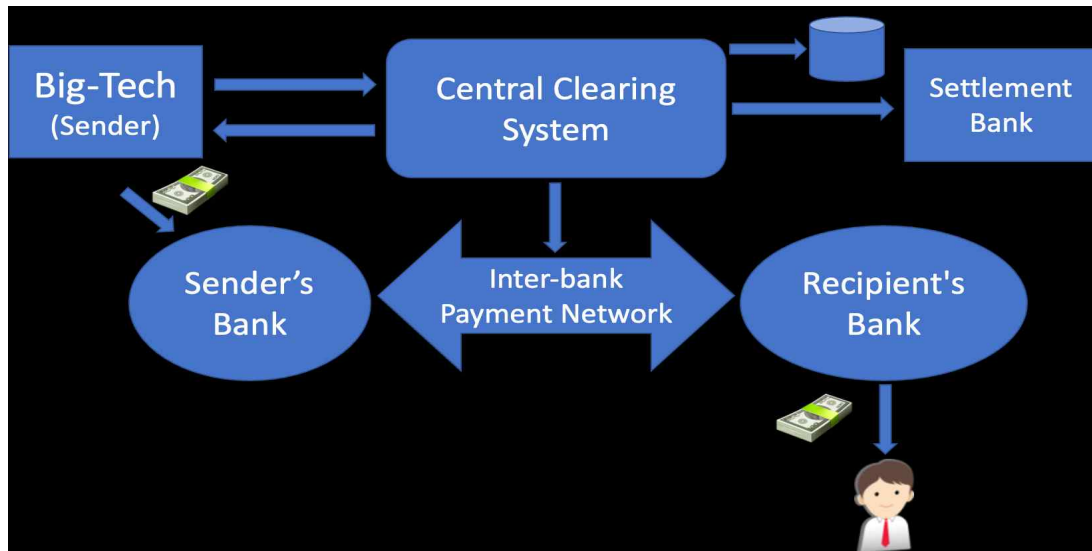
First of all, there is a possibility of arbitrarily changing the usage of customer's fund through booking manipulation. Secondly, there is risk of money laundering and financial fraud through big tech accounts. This is because the transfer transaction to a financial institution is made in the name of big-tech, so it is impossible to identify the actual payer and recipient. For this reason, it is needed for trusted organization to ensure transparency in transactions by detecting whether Big Tech has manipulated the ledger and recording the transaction status of individual consumers.

4.2. Suggestion of a Big-tech's Customer Fund Protection Model

There might be a variety of models for big-tech's customer fund protection. In this study, we suggest a model that all payment transactions of big-tech platforms must be routed through the central clearing system, and the central clearing system approves and processes the transactions, and records transaction results.

4.2.1. Transaction Process of the Protection Model

< Figure-11. Transaction Process of the Protection Model >



- ① Big-tech sends the fund transfer message with the real sender's name.
- ② The central clearing system sends the message to the sender's bank (the big-tech's account) and the recipient's bank (the real recipient's account) through the inter-bank payment network.
- ③ The sender's bank withdraw the amount of money from the big-tech's account.
- ④ The recipient's bank deposit the amount of money to the real recipient's account.
- ⑤ The central clearing system sends back the transaction result to the big-tech.
- ⑥ The central clearing system records the transaction result to internal DB with the real sender's name.
- ⑦ The central clearing system sends the clearing data to the settlement bank for inter-bank final settlement.

4.2.2. Expected Benefits of this Model

This model can store the payment transaction result in the central database immediately after transaction processing, and it will secure the legitimacy and credibility of big tech payment transactions. It would be beneficial to consumers. When processing the deposit refund, the final record of the central system will be used, so a quick refund will be possible. It is also going to be beneficial to big-techs. As transaction information needs to be delivered only to the central system, which is a single contact point, it will increase convenience and efficiency. From the perspective of the supervisory authority, it would be very convenient to request a refund to the safeguard account management institute, because there is no need to confirm the accuracy of transaction information, in the event of an accident such as big-tech bankruptcy.

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