

The Application of Herfindahl-Hirschman Index in Measuring the Concentration Level of Financial-Technology Industry

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ABSTRACT

The Herfindahl-Hirschman Index (HHI) is a tool for measuring industrial concentration. Industrial concentration is an indication of the occurrence of monopoly. Supervision of business competition is one of the tasks of the Indonesian Competition Commission (ICC) per the Law of the Republic of Indonesia Number 5 Year 1999. This research aimed to determine the effectiveness of the use of HHI in measuring the concentration of financial-technology industry. This research used normative and descriptive judicial research methods. This study examined several calculation patterns in using HHI. This research concluded that the financial-technology industry has a broad scope. Financial technology has a wide range of industries. Measurements based on financial technology are imprecise. Financial technology includes peer-to-peer lending, crowd funding, financial literacy, insurance, and others.

Keywords: *Herfindahl-Hirschman Index, Industry Concentration, Business Competition*

1. INTRODUCTION

The Indonesian Competition Commission has the task of supervising businesses in carrying out their business activities to avoid monopolistic practices and unfair business competition [1]. One indication of the occurrence of unfair business competition is the occurrence of industrial concentration. The measurement of industrial concentration uses the Herfindahl-Hirschman Index (HHI). The measurement of concentration index is based on the similarity of business industries. Kulmetov measured the banking industry [2]. Measurement of the financial sector has also been done in the financing industry [3]. The use of data in measuring HHI for the financial industry uses total assets, not total sales. Sales to financial institutions does not have a direct relationship with company size. Assets reflect the size of the company that can affect the market. Assets of financial institutions are the company's ability to manage funds obtained from the public [4]. The measurements of industrial concentrations of baby diapers have also been conducted. [5]

The HHI value of 10,000 indicates that there is a concentration of monopoly. The value of HHI that is still allowed, is between 1,000 and 1,800 [6]. The HHI value above 2,500 indicates that the industry has a high concentration [7].

HHI influences the stability of the banking-industry system [8]. HHI also has its drawbacks. HHI focuses on the position of the dominant business. HHI focuses on the market share of sales [9].

The violation of HHI will harm the economic system of a society. Therefore, the government regulates industrial concentration through an independent commission based on statutory regulations. A concentrated industry creates a deadwood loss [10].

The measurement of HHI in the financial-technology industry is a new thing. Merger and acquisition transactions in the financial-technology industry are still few. The measurement of HHI is still rarely done. This study focused on the use of HHI in measuring the concentration of market structure of the financial-technology industry.

The novelty of this research is in explaining the use of HHI in the financial-technology industry. The study fills an unprecedented research gap regarding the characteristics of the financial-technology industry.

This study has research questions regarding how the market structure of the financial-technology industry is, and how to use the right HHI in measuring the concentration of financial-technology industry per the laws and regulations. This research provides a definition of the financial-technology industry. Research contributes to regulators and practitioners that the calculation of HHI for industrial technology must be separated by sector. Merging the

technology industries into one will result in the HHI index not reflecting actual conditions.

2. RESEARCH METHOD

This research used the descriptive normative method. This research studied the research materials in measuring the financial-technology industry based on Indonesia's existing laws and regulations. The laws are Banking Law, Financial Services Authority Law, and Central Bank Regulations. This research obtained primary, secondary, and tertiary materials. Primary materials are materials obtained directly from the field. Secondary materials are the laws and regulations that apply in measuring the market-concentration index. Tertiary materials are the information which is published in public domain [11].

3. DISCUSSION

3.1. Financial Technology Industry Structure

The financial-technology industry is an industry that combines the business in financial sector by using technology. The financial sector consists of the banking industry, financing, insurance, capital markets, venture

capital, microfinance institutions, pawnshops, and others. This definition is released by the Financial Services Authority of Indonesia. The financial industry has total assets of more than thousands of trillions. The details of the financial sector are described in Figure 1.

The financial-technology industry is not part of the financial industry. The financial-technology industry is the same as the financial industry. The financial-technology industry has the same characteristics as those of the financial industry. The financial-technology industry has the function of collecting public funds, distributing financing to public, and offering capital market products and insurances. Therefore, the financial-technology industry is an industry that is equal to the financial sector.

The grouping of financial-technology industry needs to follow the existing financial-industry groupings. The financial-technology industry is not a single industry, but is the same as the current financial industry.

The financial-technology industry needs to be divided into sub-sectors. At this time, we only know about the financial technology. Financial technology consists of more than one sub-industry. The division of financial-technology industry must follow the existing division of the financial industry. Redefining the financial-technology industry is crucial. Due to the rapid growth of financial-technology industry, the introduction of financial-technology industry should be done as soon as possible. The public, regulators, practitioners only know one industry, namely the financial-technology industry.

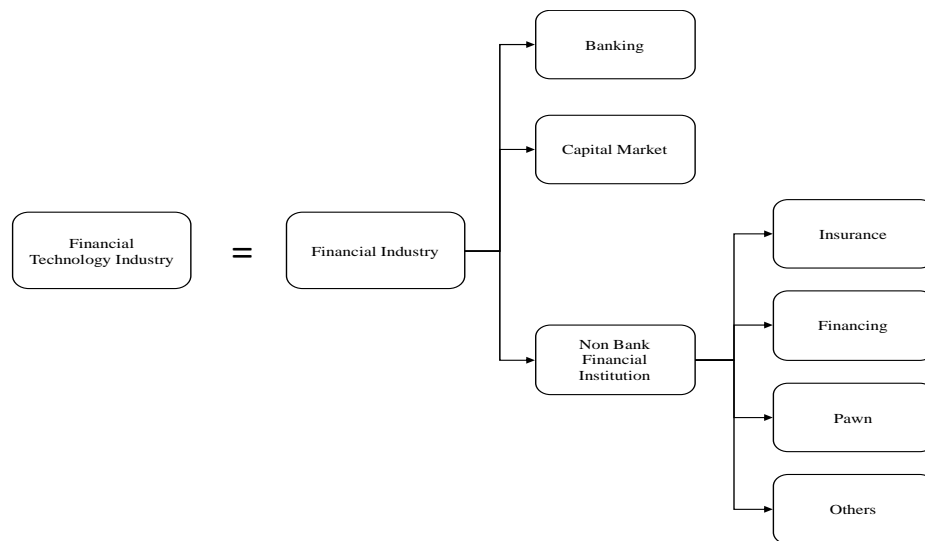


Figure 1 Financial Industry Explanation

3.2. The Use of HHI in Measuring the Concentration of Financial Industry

HHI is a formula for measuring market concentration. HHI was discovered by Orris C. Herfindahl and Albert O. Hirschman. Market concentration is part the of market-structure measurement. The HHI formula is as follow [12]:

$$HHI = \sum (\text{Market Share}_i)^2 \times 10.000$$

In measuring HHI for the financial-technology industry, it must be separated and should not be grouped. This is due to the different characteristics of financial-technology industry. The financial-technology industry should be grouped as depicted in Figure 2.

The division of financial-technology industry sector will make it easier for policy makers. Merging all sectors into one financial industry will confuse the public and business actors. The grouping of industries into sectors will facilitate oversight

by regulators. Business actors will find it easier to control the competition. People will also find it easier to compare one service to another.

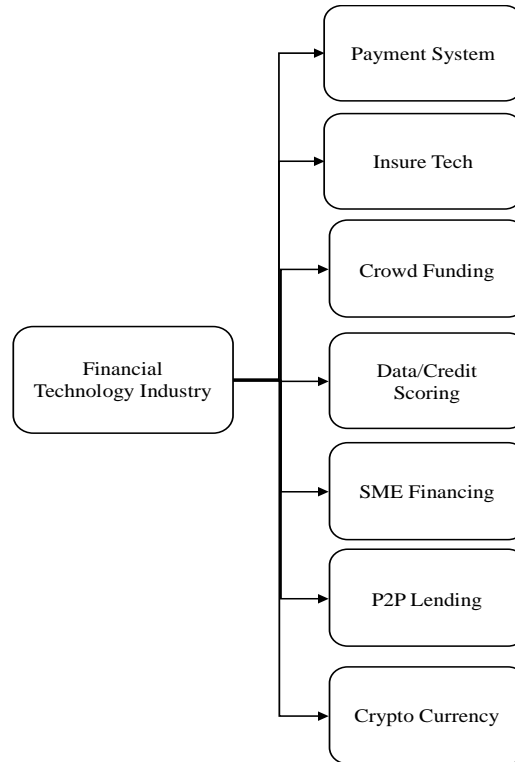


Figure 2 Financial-Technology Industry Grouping

Measures in the HHI must also be separated from the data used. P2P Lending must be divided into two main groups, namely receiving funds and distributing funds, which are different. This grouping will clarify the concentration of each industry.

SME Financing is calculated based on the total disbursed-funds. In contrast, the payment system is calculated based on the number of transactions that occur and are carried out through the existing system. HHI Crowd Funding is calculated

based on the number of funds obtained. Insure Tech is calculated based on the number of policies and funds issued. The bases of calculations are shown in Table 1 and Table 2. The measurement of technology-based companies is different from that of conventional companies. The measurement of technology-based companies should be based on the source of revenue stream. Technology-based companies can have very minimum assets. This is different from the conventional companies that have large amount of assets.

Table 1 HHI Calculation for Financial-Technology Platform

No.	Financial Technology (Platform Only)	HHI Based
1.	Payment System	Transaction Amount
2.	Insure Tech	Number of Transaction
3.	Crowd Funding	Transaction Amount
4.	Data / Credit Scoring	Number of Client
5.	SME Financing	Transaction Amount
6.	P2P Lending	Transaction Amount
7.	Crypto Currency	Transaction Amount

The financial-technology industry has different characteristics from the traditional-financial sector.

The technology of financial industry has two functions, namely technology providers and fund managers. Not all financial-technology companies perform both of these

functions. Some serve only one function as a technology provider, some provide fund management, and some do both. The calculation of HHI must be based on the types of business and the sources of income rather than the activities. The source

of income indicates the target financial-technology company. The measurement of HHI must understand about the business model of each industry.

Table 2 HHI Calculation for Financial-Technology Platform

No.	Financial Technology (Business)	HHI Based
1.	Payment System	Transaction Amount
2.	Insure Tech	Total Asset
3.	Crowd Funding	Transaction Amount
4.	Data / Credit Scoring	Revenue
5.	SME Financing	Total Asset
6.	P2P Lending	Total Asset
7.	Crypto Currency	Total Asset

4. CONCLUSION

The financial technology industry is an industry consisting of several financial sectors as well as the financial industry. The measurement of the concentration of financial-technology industry must be calculated based on each sector. Merging the financial sector into one will lead to errors in interpreting the results of HHI.

The financial-technology industry is not a sub-industry of the financial sector. This research has a limitation, because it is only based on the existing rules and calculations. In the future, this research can be developed by comparing the total financial-technology industry to the financial-technology sub-industries, such as P2P Lending, Crowdfunding, Insure Tech, and others.

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