# DIVERSIFYING INCOME SOURCES AND IMPACTS ON NON-INTEREST INCOME RATIO OF VIETNAMESE COMMERCIAL BANKS

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**Abstract:** ***Diversifying and enriching services to promote pure income, disperse risks and enhance the overall input results of commercial banks is one of the goals that must be achieved in general by any business organisation and commercial banks in particular. Diversifying income sources (HHI) and the impacts of HHI on the non-interest income ratio (NII) of commercial banks are analysed in this article. Data on the ratio of non-interest income and the income diversification status of 25 joint stock commercial banks trading on the HOSE, HNX and Upcom exchanges were collected and determined by calculations based on the financial statements of the above commercial banks linked to the period from 2013-2023, combined with the use of Stata 16 tool. Exploring the dependence of NII on HHI was conducted by regressing the NII variable on HHI and other variables such as bank size (QM), percentage of deposits compared to total assets (TG), marginal interest income ratio (LCB), rate of equity to total assets (VCSH), percentage of outstanding loans compared to total assets (CV), level of technological modernity (ATM), percentage of expenses compared to total income, (CP) percentage of profit after tax compared to average of total assets (ROA), economic growth rate (GDP), inflation rate (INF) and real interest rate (IR). In the study, the author stated that the relationship between HHI and NII has a positive impact. In addition, QM, ATM, CP, GDP INF also affect the NII of commercial banks in different directions.***

• Keywords: *income diversification, non-interest income, commercial bank.*

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## 1. Urgency of the study

The non-interest income of commercial banks, which is the amount consumers pay for services other than credit services, plays a crucial role in maintaining the profits of commercial banks. This is particularly significant in the current context of declining interest income. The above amount is paid for fees and commissions each commercial bank decides. Commercial banks record this amount as fees collected by commercial banks. In addition, non-interest income also includes income when commercial banks conduct foreign currency trading, valuable papers trading, other investments in different markets and derivative goods. These sources of income are increasingly focused on because they are sources of income associated with activities off the balance sheet of commercial banks, so they are often risk-free.

Diversifying commercial banks' income sources is a strategic approach where commercial banks seek different ways to consolidate and enhance their financial performance. This involves providing various services and helping improve and create more revenue for commercial banks. The trend of diversifying, promoting, and making many different financial-monetary businesses of commercial banks today (like a financial department store) aims to find ways to consolidate and increase the final output for commercial banks. Diversifying revenue from many different activities is also a way for commercial banks to spread out risks.

The final output from commercial banks' monetary and financial transactions is the revenue sources classified into interest and non-interest revenue. However, it can be seen that currently, the income from credit services of commercial banks is decreasing. Commercial banks promote other business activities to maintain stable and increasing output value. Commercial banks research, deploy and provide increasingly rich and complete financial services as a manifestation of actions to diversify and enrich income sources. The above statement is consistent with the view that an organisation that guides and explains to customers to accept products with high integration of utilities and diversity has the opportunity to realise many of their latent needs, thereby bringing more income to commercial banks. To verify the accuracy of the above argument, regression of the relationship between NII and HHI is performed. On that basis, it is affirmed that the trend of increasing, promoting and diversifying other financial services of commercial banks in Vietnam in the present and future is entirely appropriate, providing reassurance about the direction of the industry. The formula for calculating the HHI level of commercial banks is used by authors

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Chortareas et al. (2008), Nguyen Thi Canh and Ho Thi Hong Minh. (2004), Dang Buu Kiem and Vo Xuan Vinh 2016, Carbo-Valverde et al. (2019). (2004), Dang Buu Kiem and Vo Xuan Vinh 2016, Carbo-Valverde et al. (2019). HHI is measured according to the formula:

$$HHI_{it} = 1 - \left(\frac{INTit}{TORit}\right)^2 - \left(\frac{CPEit}{TORit}\right)^2 - \left(\frac{OTHit}{TORit}\right)^2$$

In which:

$HHI_{it}$: the level of income diversification of each bank by year

$INT_{it}$: Total value of revenues after offsetting interest expenses and the difference of revenues after offsetting interest-like expenses of each commercial bank by year

$CPE_{it}$: the total difference between revenues and expenses from non-credit activities of each commercial bank by year

$TRA_{it}$: the difference between the value of income and expenses arising from business activities and investment activities of each commercial bank by year

$OTH_{it}$: total difference of revenues and expenses from other activities of each commercial bank by year

$TOR_{it}$: total difference of revenues and expenses from all activities of each commercial bank by year

Many works have surveyed the impact of income diversification on the NII of commercial banks. However, most of these works are conducted in regions around the world with different conditions in terms of operations and business environment compared to commercial banks in Vietnam. Moreover, the research sample was formed from 25 commercial banks trading on the HOSE, HNX, and Upcom markets from 2013 to 2023, so it is more novel and different from previous studies. The findings from the research are the premise for proposing recommendations to expand other sources of income for commercial banks in addition to interest in line with the State Bank's strategy of expanding and diversifying the sources of income of commercial banks to break the "monoculture" of credit.

**2. Theoretical basis for building the model**

How HHI affects the total income of commercial banks, and NII is answered in the research works that have been done.

Pasiouras and Kosmidou (2007) explored the impact of HHI on the final efficiency of commercial banks in the UK. Their study found that HHI positively affects the final output of commercial banks. Income diversification, achieved by expanding and consolidating non-interest income sources, allows commercial banks to gradually distance themselves from the volatility of interest income, thereby increasing other non-interest income. Pasiouras and Kosmidou argue that while diversification contributes to higher final output, it is crucial for commercial banks to effectively manage the challenges and instabilities associated with non-traditional income sources.

Laeven and Levine (2008), through investigating how income diversification and its impact on the stability and sustainability of commercial banks in emerging markets, have found a positive interaction between income diversification and non-interest income sources. The study confirms that HHI increases other sources of income of commercial banks besides interest income, and the performance of commercial banks is improved, creating a basis for enhancing sustainability. At the same time, commercial banks have actively implemented the risk spread across different revenue streams. On the other hand, this study also claims that commercial banks in emerging regions enjoy many benefits from diversification because it provides a buffer against the instability of interest rates and the economy.

Stiroh (2004) focused on examining the interactions between NII and the activities of commercial banks along with risk management. Stiroh emphasised that changes in HHI due to changes in transaction income and fees from financial services can generate additional profits. However, Stiroh also argued that more risks will arise due to the expansion of various activities to generate non-interest income. Therefore, commercial banks must carefully monitor the potential complications of their diversified activities to avoid excessive risk-taking. Effective risk management and strategic monitoring positively impact optimising non-interest income sources while minimising the associated risks.

Le Thanh Tam (2022) discovered that the income diversification strategy impacts NII (the structure of non-interest income is adjusted according to this strategy).

In addition, QM, TG, LCB, VCSH, CV, ATM, CP, ROA, GDP, INF, and IR are also noted to impact NII in different directions, which are considered control variables in this study.

**3. Research model, data and research method**

***3.1. Research model***

Our research model is not a random assortment of variables. It is established based on a systematic approach, as detailed in Table 1. Each variable, such as NII, HHI, QM, LCB, TG, CV, VCSH, ATM, ROA, CP, GDP, INF and IR, plays a specific role in our study.

**Table 1: Introduction to variables**

| Type of variable | Calculation method | Authors | Expected direction of impact |
|---|---|---|---|
| ***Dependent variable of the model*** | | | |
| NII | $\frac{Non\ -\ interest\ income}{Total\ income}$ | Hoàng Ngọc Tiến, Võ Thị Hiền (2010) | |
| Independent variable of the method | | | |
| HHI | $1-\left(\frac{INTit}{TORit}\right)^2-\left(\frac{CPEit}{TORit}\right)^2-\left(\frac{OTHit}{TORit}\right)^2$ | Pasiouras and Kosmidou (2007), Chortareas et al., (2008), Laeven and Levine (2008), Stiroh (2004), Lê Thanh Tâm (2022) | + |
| ***Control variable*** | | | |
| QM | Log (Total assets of commercial banks) | Aslam (2015) | + |
| TG | $\frac{Total\ deposits}{Total\ assets}$ | Aslam (2015) | + |
| LCB | $\frac{Interest\ income\ -\ Interest\ \ expense\ -\ interest\ paid}{Total\ earning\ assets}$ | Nguyen . J (2012) | - |
| VCSH | $\frac{Total\ equity}{Total\ assets}$ | Chortareas (2012) | + |
| CV | $\frac{Total\ oustanding\ debt}{Total\ assets}$ | Hahm (2008) | - |
| ATM | Number of ATM | Bailey-Tapper (2010), Atelu (2016 | + |
| CP | $\frac{Total\ cost}{Total\ revenue}$ | Meng (2018 | + |
| ROA | $\frac{Profit\ after\ tax}{Total\ assets}$ | Hahm (2008 | + |
| GDP | $\frac{GDP\ in\ year\ t\ -\ GDP\ in\ year\ t-1}{GDP\ in\ year\ t-1}$ | Hakimi (2012 | + |
| INF | Inflation rate of each year | Chortareas (2012); | - |
| IR | Annual real interest rate | Hahm (2008) | + |

*Source: Author's construction from overview*

### *3.2. Research data*

To study the relationship between the impact of HHI and commercial banks' NII, the author calculated these two variables, along with control variables, from data provided in the financial statements system, which has been verified for the accuracy of commercial banks' trading on HOSE, HNX, and Upcom. Data for the remaining variables were collected from reports from the General Statistics Office.

### *3.3. Research method*

Table data were processed using Stata 16 software in the following order: research sample statistics, correlation analysis, multicollinearity testing, and regression analysis. The author used the software's characteristic tests to select the most suitable regression model. The best-selected model was then tested for model defects and calibrated.

## 4. Research results and discussion

### *4.1. Research sample and statistical results*

The research sample includes 25 commercial banks from 2013 to 2023. However, because two commercial banks, HDB and VBB, did not have financial statements in 2013, there were only 271 observations. Statistical results of 271 observations extracted from the software are shown in Table 2.

**Table 2: Statistics of research sample**

| Variable | Observed | Mean | Standard Deviation | Minimum Value | Maximum Value |
|---|---|---|---|---|---|
| NII | 271 | 0.09148 | 0.054659 | -0.0275 | 0.289921 |
| HHI | 271 | 0.874545 | 0.060323 | 0.698725 | 0.992613 |
| QM | 271 | 1049855 | 1.2321307 | 2.944996 | 1.6325408 |
| TG | 271 | 0.880642 | 1.017983 | 0.065576 | 15.26915 |
| NIM | 271 | 3.020145 | 1.472837 | 0.00593 | 10.48703 |
| CV | 271 | 0.662893 | 0.755742 | 0.036859 | 12.43355 |
| ATM | 271 | 486.1513 | 663.8707 | 20 | 2510 |
| CP | 271 | 0.861579 | 0.095031 | 0.53781 | 1.15888 |
| ROA | 271 | 1.011994 | 0.918533 | 0 | 7.375422 |
| VCSH | 271 | 0.095235 | 0.109606 | 0.005599 | 1.329581 |
| GDP | 275 | 5.71397 | 1.754148 | 2.09 | 8.08 |
| INF | 275 | 3.373497 | 1.577056 | 0.631201 | 8.02 |
| IR | 275 | 9.237273 | 1.63877 | .56 | 12.5 |

*Source: Stata 16 running results*

NII of commercial banks fluctuates around 0.09148, with an upper limit of about 0.29 and a lower limit of -0.0275. The above data confirms that NII is relatively low in total income (the most significant ratio is less than 30% of total revenue). There were commercial banks in 2013 and 2014 where NII was negative, indicating that non-interest expenses were more significant than income when implementing these activities (LBP and OCB banks). NII of commercial banks fluctuates wildly, clearly reflecting the differentiation between groups of commercial banks. HHI fluctuates around 0.874545, the upper limit is 0.99, and the lower limit is 0.698; the standard deviation is 0.06, showing that the HHI of commercial banks does not have too much differentiation. The remaining control variables are QM, TG, LCB, CV, ATM, CP, ROA, and VCSH, all of which show differentiation and lack of uniformity among the groups of commercial banks.

### *4.2. Correlation analysis results*

**Table 3: Correlation analysis matrix**

| | NII | HHI | QM | TG | LCB | CV | ATM | CP | ROA | VCSH | GDP | INF | IR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NII | 1 | | | | | | | | | | | | |
| HHI | -0.3211* | 1 | | | | | | | | | | | |
| QM | -0.0301 | -0.0096 | 1 | | | | | | | | | | |
| TG | -0.1281* | 0.0061 | -0.0105 | 1 | | | | | | | | | |
| NIM | 0.3044* | -0.6999* | 0.0655* | -0.0282 | 1 | | | | | | | | |
| CV | -0.0564* | -0.0168 | -0.0236 | 0.8899* | 0.008 | 1 | | | | | | | |
| ATM | 0.3329* | -0.2439* | -0.0013 | -0.0742* | 0.1228* | -0.2668* | 1 | | | | | | |
| CP | -0.5405* | 0.7355* | 0.0234 | 0.0173 | -0.4705* | -0.0419* | 0.03 | 1 | | | | | |
| ROA | 0.3853* | -0.5346* | -0.0202 | -0.0255 | 0.4423* | 0.0257 | 0.1557* | -0.6750* | 1 | | | | |
| VCSH | -0.0359 | -0.0279 | -0.0285 | 0.6145* | 0.0422* | 0.6904* | -0.1021* | -0.0766* | 0.0663* | 1 | | | |
| GDP | -0.1740* | 0.0318 | 0.0013 | 0.0899* | 0.0216 | 0.0605* | -0.0309 | 0.1655* | -0.0273 | 0.0893* | 1 | | |
| INF | -0.1133* | 0.2857* | 0.0993* | -0.0403 | -0.1453* | -0.0790* | -0.0644* | 0.2000* | -0.1228* | -0.0174 | 0.0918* | 1 | |
| IR | -0.2930* | 0.1507* | 0.1287* | -0.0310 | -0.1191* | -0.1232* | 0.0012 | 0.4062* | -0.2763* | -0.0310 | 0.2299* | 0.4227* | 1 |

*Source: Stata 16 running results*

NII is correlated with HHI, but the correlation is negative. Variables that hurt NII, TC, VC, CP, VCSH, GDP, INF, and IR. Variables that have a position impact on NII are LCB, ATM and ROA.

### *4.3. Multicollinearity test*

**Table 4: Multicollinearity test results**

| Variable | VIF | 1/VIF |
|---|---|---|
| CV | 5.06 | 0.197752 |
| HHI | 4.06 | 0.246170 |
| CP | 3.88 | 0.257512 |
| LCB | 2.12 | 0.471442 |
| VCSH | 2.01 | 0.496386 |
| ROA | 1.94 | 0.515904 |
| IR | 1.7 | 0.586977 |
| INF | 1.37 | 0.731717 |
| ATM | 1.15 | 0.873169 |
| GDP | 1.11 | 0.903499 |
| QM | 1.03 | 0.969625 |
| TG | 2.05 | 0.876543 |
| Mean VIF | 2.63 | |

*Source: Stata 16 running results*

### *4.4. Regression model*

Table 5 presents the regression model results, a significant tool in our study for examining the impact of HHI on the NII of Vietnamese commercial banks.

**Table 5: Regression models**

| Variable | OLS | FEM | REM | FGLS |
|---|---|---|---|---|
| HHI | 0.309*** | 0.589*** | 0.499*** | 0.499*** |
| | (0.0888) | (0.0837) | (0.0809) | (0.113) |
| QM | -8.922111 | -4.5732010 | -3.1046710 | -3.1023510 |
| | (2.192010) | (1.8922110) | (1.8623210) | (6.8758111) |
| TG | -0.00716 | -0.00296 | -0.00373 | -0.00373 |
| | (0.00587) | (0.00463) | (0.00467) | (0.00337) |
| LCB | 0.00853*** | 0.000921 | 0.00307 | 0.00307 |
| | 0.00263) | (0.00239) | (0.00234) | (0.00321) |
| CV | 0.00359 | 0.00350 | 0.00350 | 0.00350 |
| | (0.00869) | (0.00693) | (0.00698) | (0.00443) |
| ATM | 1.752605*** | 8.3821305 | 2.2676305** | 2.2643105*** |
| | (4.282306) | (5.5432705) | (9.18e-06) | (7.872650) |
| CP | -0.326*** | -0.379*** | -0.368*** | -0.368*** |
| | (0.0551) | (0.0487) | (0.0481) | (0.0839) |
| ROA | 0.00159 | 2.8421305 | 0.00110 | 0.00110 |
| | (0.00403) | 0.00323) | (0.00322) | (0.00502) |
| VCSH | -0.00412 | -0.000718 | -0.000177 | -0.000177 |
| | (0.0344) | (0.0283) | (0.0284) | (0.0169) |
| GDP | -0.00202 | -0.00170 | 0.00181 | -0.00181* |
| | (0.00158) | (0.00117) | (0.00119) | (0.000946) |
| INF | -0.000722 | -0.00340** | -0.00278* | -0.00278* |
| | (0.00199) | (0.00163) | (0.00163) | (0.00168) |
| IR | -0.00155 | -0.000824 | -0.00140 | -0.00140 |
| | (0.00214) | (0.00190) | (0.00177) | (0.00197) |
| Constant | 0.0989 | -0.111 | -0.0181 | -0.0181 |
| | (0.0704) | (0.0757) | (0.0631) | (0.0697) |
| Observations | 271 | 271 | 271 | 271 |
| R-squared | 0.390 | 0.415 | | |
| Number of NAME | | 29 | 29 | 29 |

*Source: Stata 16 running results*

FEM is better than OLS (through the F-test). REM is more optimal than FEM (through the Hausman test). However, REM has autocorrelation and variable error variance, so it requires recalibration. The FGLS model provides information on the changes in HHI, which in turn lead to changes in NII. In addition, ATM and CP also have an impact on NII.

HHI has a positive effect on NII because commercial banks need to diversify and enrich their income by designing and expanding product and service packages, enriching business activities, and increasing income output from multiple sources, rather than focusing solely on interest income. Diversifying and enhancing products and services, especially non-credit services, will increase non-interest income. The relationship between HHI and NII of commercial banks in this regression model is similar to the assertions of Pasiouras and Kosmidou (2007), Chortareas et al. (2008), Laeven and Levine (2008), Stiroh (2004), Le Thanh Tam (2022) before.

ATM has a positive impact on NII. The more modern the technological infrastructure of commercial banks is, the more conditions commercial banks have to connect with many ecosystems, upgrade the benefits and convenience of the product packages provided by commercial banks, and emphasise the group of digitalised services, thereby quickly creating excitement, curiosity, attracting users, attracting more potential customers, retaining traditional customers, expanding other sources of revenue besides interest income. The above findings are consistent with the previous findings of Bailey-Tapper (2010), Atelu (2016).

According to the results of running the cost model, increasing costs reduce NII; this relationship is opposite to the relationship previously discovered by Meng (2018), Hahm (2008), Lepetit (2008), and Doan Viet Hung (2020). In Vietnam, most commercial banks are concerned about the impacts of the technology-embedding process on transforming operations in the banking industry. They are implementing the first steps in the digitalisation process, so investment costs and technology conversion are often higher than non-interest income received. Investment costs to upgrade and modernise technology are considered prepaid expenses but are gradually accounted for to avoid creating too large profit fluctuations. On the other hand, with new products in the early stages of market penetration, income wbe low, which is insufficient to cover costs, thereby reducing NII. On the other hand, with these new products, commercial banks have to spend a lot of budget on advertising and marketing costs, reducing NII.

## 5. Implications from the model and some suggestions

### *5.1. Meaning from the research model*

Commercial banks need to focus on promoting non-interest revenue sources in the context of declining interest revenue due to the reduced ability to absorb credit capital in the economy during the recession period and the need to maintain profits by reducing LCB. The results of running the model confirm that diversifying and enriching income is a solution for commercial banks to promote potential non-interest revenue sources. In addition, the selective application of advanced and modern technology in each stage of commercial banks' operating processes will create a breakthrough and have a favourable impact on NII.

### *5.2. Content of suggestions*

#### *5.2.1. For commercial banks*

Commercial banks should plan policies and strategies to diversify and enrich their income sources, especially by emphasising the income generated from new products and services, in addition to credit services. Non-interest income includes fees, commissions, income from investment activities, securities trading and foreign exchange trading. For services with fees and commissions, it is necessary to maintain the old product group, conduct in-depth research to thrive and provide many new product packages, joint packages, product packages with high technology content,

derivative service groups, asset management service groups, securities consulting service groups, guarantee services, personal financial management... Along with the trend of expanding fee and commission services, commercial banks need to stabilise and reduce fees, emphasise the fundamental value of the product, enhance their potential and position in the market through quality, increase non-interest income by increasing the number of transactions, and increase the scale of transactions. Commercial banks must carefully research securities-related operations and invest according to the portfolio to disperse risks. For foreign exchange trading activities, it should be maintained at an appropriate level, strictly adhering to the regulations on the supervision and management of the foreign exchange status of the State Bank.

Second, each commercial bank should continue to consolidate, build, and enhance its reputation and image. A bank's reputation and brand are essential factors affecting customers' purchasing decisions. Moreover, in the increasingly competitive financial market, each bank's brand and recognition are always in customers' minds when deciding which commercial bank to transact with. Additionally, after-sales service activities must also be addressed to strengthen relationships with existing customers and attract new ones.

Third, commercial banks must take risks seriously. The more they expand and diversify their products, the harder it becomes to manage and the greater the risks they pose. More risks will have a more adverse impact on the quality of products and services, negatively impact customer satisfaction and directly reduce profits. Therefore, along with expansion, support, and promotion to enrich new services and activities, commercial banks need to pay attention to monitoring, tracking, minimising, and handling risks arising during the process of staff performing operations, risks related to strategies and policies, as well as governance processes and core banking systems. Measures and risk management contents that commercial banks can consider should include gradually declaring the responsibilities of management staff, operational staff performing operations, and indirect staff to handle testing the security system.

Fourth, commercial banks need to continue researching and experimenting to take advantage of technological optimisation in their operations and daily activities. In the new journey, digital technology, with its profound and drastic impact of digital transformation, is a factor that participates in the production process, playing a pivotal role in research, testing, application, and development, and innovating how to provide new products and services. Commercial banks partner with Fintech to increase financial understanding and enhance user experience. Along with the trend of increasing the contribution of technology in financial products and service packages, financial institutions need to pay attention and have solutions to resolve potential challenges related to network security and customer data privacy rights.

*5.2.2. Recommendations for state management agencies*

First, agencies planning and issuing policies must create a favourable and stable business environment, control inflation, and set appropriate interest rates in an open economy to avoid shocks from the international environment and ensure the domestic financial market develops stably and healthily. A favourable business environment is essential in diversifying commercial banks' operations. Stabilising the macroeconomic environment minimises risks and losses in diversifying commercial banks' operations.

Second, for new financial services such as financial consulting, asset management, providing retirement plans, etc., there needs to be specific guidance from inter-sectoral agencies and organisations with management functions through guiding documents, decrees, and circulars. Therefore, management agencies and organisations need specific instructions for these activities so that commercial banks can implement them smoothly through documents, circulars, and guiding decrees.

Third: The State Bank needs to improve the effectiveness of banking inspection and examination and early warning activities of potential risks in the system, preventing violations of banking laws. The State Bank needs to have sanctions and thoroughly handle, with the right people and the right crimes, violations and risks that destabilise the system's operations.

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