

The impact of financial inclusion on improving the capital of banks in Italy for the period (2007-2020)

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Abstract:

This study aims to identify the impact of financial inclusion on the capital of Italian banks during the period 2007-2020. To achieve this goal, the study examines the reality of financial inclusion in Italy, using indicators such as the number of ATMs, the number of bank branches, and the number of borrowers in Italian banks as independent variables. In addition, the financial performance of banks' capital, as a dependent variable, is measured and analyzed. The study then estimates, interprets, and tests a multiple regression model.

An analytical-descriptive approach was adopted to study capital and the reality of financial inclusion in Italy. The study found a statistically significant positive correlation between financial inclusion and the improvement of the capital of Italian banks at a 5% error level. As a result, the study recommends further expanding financial inclusion through financial technology to provide financial services at lower costs, particularly in remote areas of Italy.

Keywords: financial inclusion; capital; ATMs

Introduction

Banks are among the most important sectors in economic activity, responding quickly to local and international changes. They serve as safe intermediaries between savers and investors by providing services for depositing and reinvesting funds. The banking sector offers a wide range of financial services, including accepting deposits, lending, investing, and other related services.

Banks aim to provide their financial services to all members of society, particularly to those with limited income, making access easier and more inclusive. Consequently, numerous innovative and advanced financial products have emerged, requiring high levels of financial literacy and education, a concept known as financial inclusion.

Financial inclusion has recently gained priority in many countries, especially after the 2008 financial crisis, due to its advantages, such as lowering the cost of capital through the efficient allocation of productive resources.

Considering That Italy is one of the most advanced European countries pursuing extensive financial inclusion, this study explores how financial inclusion affects the capital of Italian banks.

Based on this purpose, the general objective of the study, and the identification of the relevant variables, the main question posed is:

How does financial inclusion affect the improvement of capital in Italian banks ?

To address this question, the study is divided into a set of sub-questions :

1. What is the current state of financial inclusion (measured by the number of ATMs, bank branches, and borrowers per 100,000 adults) and the capital of banks in Italy ?
2. What is the nature of the relationship between the spread of financial inclusion and the improvement of the capital of Italian banks ?

Hypotheses of the study :

The study proposes the Following hypotheses as preliminary answers:

1. The inclusiveness level of Italian banks may increase due to the development and digitalization of financial services, leading to a rise in their capital.
2. Financial inclusion (represented by the number of ATMs, bank branches, and borrowers) will significantly impact the improvement of Italian banks' capital at a significance level of $\alpha = 0.05$ during the study period.

Objectives of the study:

The main objective of this research is to examine the impact of financial inclusion on the capital of Italian banks in light of the efforts made by banks to provide financial services to all individuals at low costs. This objective is achieved by analyzing the data and indicators of financial inclusion and capital from 2007 to 2020 and by studying the experiences of various countries in implementing financial inclusion based on previous studies.

Importance of the Study:

This study gains importance by addressing a critical topic in the banking sector: financial inclusion and its link to the capital index of Italian banks. The study aims to understand financial inclusion and its impact on the capital of Italian banks.

Methodology of the Study:

The research adopts a descriptive-analytical approach, examining the theoretical framework of financial inclusion, its importance, and its key dimensions. The study then analyzes the reality of financial inclusion and financial performance to understand the extent of its impact on the financial performance of Italian banks.

To answer the study's questions, it is divided into a theoretical part and an applied part. The theoretical part reviews studies examining the relationship between financial inclusion and the financial performance of banks and provides an overview of financial inclusion and its principles. The applied part analyzes and tests the relationship between financial inclusion and financial performance using the capital index of Italian banks and provides key results and proposed recommendations.

Theoretical Part:

1. Previous Studies:

This section reviews the most significant previous studies related to financial inclusion and its dimensions.

For instance, a study by) Alagh & Emeka 2014), titled "Impact of Cashless Banking on Banks' Profitability: Evidence from Nigeria," aimed to examine the impact of non-cash services on bank profitability in Nigeria. Non-cash services were measured using indicators such as the prevalence of ATMs, collection points, and the extent of financial services provided over the network. The financial performance variable was measured using the rate of return index. Data were collected from the annual reports of 28 banks from 2006 to 2012. The study found a significant positive impact of the prevalence of automated banking devices and collection points on banks' profitability, while financial services over the Internet showed a non-significant positive impact due to high fees that reduced customer demand.

Similarly, the study by (Sifunjo Kisaka et al. 2015), "The Relationship between Mobile Banking Deepening and Financial Performance of Commercial Banks in Kenya," explored the link between the expansion of mobile financial services and the financial performance of commercial banks in Kenya. The study relied on secondary data from the annual reports of banks listed on the Kenyan Stock Exchange between 2009 and 2013. It found a non-significant positive relationship between mobile financial services and financial performance in banks, while the number of customers reached annually via mobile phone and the volume of transactions conducted via mobile phone positively affected the financial performance of banks.

Another study by(Rehab EmadEldeen 2023), "The Effect of Financial Inclusion on the Financial Performance of Commercial Banks: An Empirical Study on Developing Countries," measured the impact of financial inclusion on commercial banks' financial performance in 39 developing countries from 2004 to 2021. The study used the fixed and random models with annual data from the global banks' database. Results showed a statistically significant positive relationship between financial inclusion through bank deposits, loans, ATMs, and the number of commercial bank branches and the financial performance of banks in developing countries.

In the same context, the study by) Suhair Mahmoud Maatouk et al 2024) examined the impact of financial inclusion on the financial performance of banks in Egypt, specifically the National Bank of Egypt from 2010 to 2022, using the least squares method. The study found a positive impact of financial inclusion on financial performance but no causal relationship between the number of branches, oil sales, capital adequacy, and financial performance.

Our study differs from previous studies by focusing on the impact of financial inclusion on improving the capital of Italian banks, while most previous studies centered on the rate of return on

assets and equity. Therefore, this study aims to fill the gap by presenting new insights into the Italian context.

2. Financial Inclusion and Its Relationship to Bank Capital :

Financial inclusion has become a strategic goal for banks, which seek mechanisms to enhance it by providing financial services and products to various segments of society through official channels without exceptions. According to **(Singh, Ramananda , & Sankharaj , 2015)**, The term financial inclusion also refers to the situation in which all individuals have access to a full range of financial services, of quality and at reasonable prices, and in a comfortable manner that preserves the dignity of customers **(younese & Buabdallah, 2023)** where all individuals, especially those with low income, and companies, including the smallest ones, have effective access and benefit from a wide range of high-quality official financial services (payments , transfers, credit ...Ekh), is provided in a responsible and sustainable manner by a variety of financial service providers operating in an appropriate legal and regulatory environment. Financial inclusion (Hocini & Ratia, 2020) includes all indicators of access to financial services for individuals and is represented by the actual proportion of the population who use financial services out of the total population. **(World Bank, 2014)** Financial inclusion is also of great **(World Bank, 2014)**

Financial inclusion is also of great importance, as it is a key factor in promoting economic growth, especially economic activities in remote and rural areas. At the same time, financial inclusion is a gradual solution to maintaining social stability by reducing income inequality. From an individual and family perspective, studies have shown that the inclusive nature of financial services can produce educational opportunities for individuals and social credit for households (**Weidong & Xiaohui , 2021**). Financial inclusion also supports the banking and financial sector, by diversifying assets and attracting new clients, increasing stability and growth **(kerdouci & brahmi, 2022)**

The Global Partnership for Financial Inclusion (GPFI) and the G20 leaders agree that financial inclusion has three main dimensions: access to financial services, usage of financial services, and the quality of financial services.

Expanding financial inclusion increases bank capital, as providing a wide range of financial services allows customers to manage their accounts and transfer funds efficiently, resulting in increased liquidity and profits, which subsequently enhances bank capital **(Musa & Abubakar Kurf, 2015)**. The widespread availability of ATMs also encourages greater use of financial services, particularly in areas where opening bank branches might be difficult, thus increasing bank liquidity and credit provision capacity, leading to long-term capital growth for banks **(Fadi Hassan Shihadeh, 2018, p. 120)**

Applied part:

1. Methodology of the study:

The main source of data used in this study is the World Bank database. The proposed model evaluates the impact of financial inclusion, represented by the number of ATMs, bank branches, and borrowers, on the capital of Italian banks using a multiple linear regression model tested with the SPSS program.

The study targets the Italian financial sector, for the period (2007-2020), using quantitative indicators of financial inclusion as independent variables, and the capital of Italian banks as a dependent variable measured by financial ratios.

2. The reality of the study variables

2.1 The reality of ATMs in Italy

Automated teller machines (ATMs) are computerized communication devices that allow customers of a financial institution to conduct financial transactions in any public place. They are also part of self-service technology, which is the main banking channel for customers to access banking services (Hussein Mohamed & Richard Bitange, 2017).

The evolution of ATMs in Italy is presented in Table 1.

Table (01): Evolution of ATMs (per 1000 adults) in Italy for the period (2007-2020)

Years	Evolution of ATMs
2007	41
2008	26
2009	106,98
(2010).	100,01
Since 2011	101,61
Since 2012	33
2013	45
2014	45
2015	25
2016	[94]
(2017).	38
(2018).	91,04
2019	91,03
(2020).	90,47

Source: Prepared by researchers based on the World Bank database on the website

<https://data.albankaldawli.org/indicator/FB.ATM.TOTL.P5?locations=T&view=chart>

The above table shows the number of ATMs per (100 thousand adults) in Italy, and from the above table we note the development and increase in the number of ATMs, reaching its highest value in 2009 at 106.98, but it witnessed a decrease in 2012, as a result of banks' adoption of other channels of electronic banking services, such as mobile banking. The number of ATMs continued to decline until it reached a value of 90.47 in 2020, and this is due to several reasons, including full reliance on completing banking transactions through the Internet, and payment through direct cards or smart mobile phone, which has become a convenient and complete alternative to traditional methods.

2.2 The reality of commercial bank branches (per 1000 adults) in Italy

Branches of commercial banks are retail locations (with individuals) of local commercial banks and other local banks that act as commercial banks, provide financial services to customers and are physically separate from the head office but are not regulated as separate legal subsidiaries.

Table (02): Evolution of bank branches in Italy (per 100 thousand adults)

Years	Branches of commercial banks (per 100,000 adults) in Italy
2007	20
2008	62,60
2009	70
(2010).	40
Since 2011	58
Since 2012	50
2013	30.00
2014	50
2015	49,80
2016	47,60
(2017).	44
(2018).	40
2019	20
(2020).	70

Source: Prepared by researchers using the World Bank database at <https://data.albankaldawli.org/indicator/FB.CBK.BRCH.P5?locations=IT&view=chart>

From the above table, we note that there has been a decline in the number of branches of Italian banks during the years of study. In 2007, the number of branches of banks (per 100,000 adults) reached about 59.20% and decreased in 2020 to 37.70%, due to several reasons, including the introduction of information and communication technology in banking, which facilitates access to all financial services for local and foreign customers, thus eliminating the need to open new branches.

2.3 The reality of borrowers from commercial banks (per 1000 adults) in Italy

The commercial bank borrowers are the number shown in the report for resident customers who are non-financial institutions (public and private), households and have taken loans from commercial banks and other banks acting as commercial banks. For many countries, the data covers the total number of loan accounts due to the lack of data on loan account holders

Table (03): Evolution of the number of borrowers (per 100 thousand adults) in Italy

Years	Borrowers from commercial banks (per 100,000 adults) in Italy
2007	425,90
2008	40
2009	70
(2010).	40
Since 2011	462,60
Since 2012	50
2013	443
2014	40
2015	50
2016	530

(2017).	10.
(2018).	40
2019	20
(2020).	50

Source : Prepared by source-based researchers : Prepared by researchers using the World Bank data base at <https://data.albankaldawli.org/indicator/FB.CBK.BRWR.P3?locations=IT&view=chart>

Through the above table, we note an increase in the number of borrowers per (100 thousand adults) in Italy , where the number of borrowers in 2007 reached 429,90. This value increases over the years and reaches 552,50 in 2020. This can be attributed to several reasons, including low interest rates and weak financial capabilities of investors .

2.4 Capital Reality in Italian Banks :

The Bank's capital-to-assets ratio is the ratio of the Bank's capital and reserves to total assets. Capital and reserves include funds contributed by owners, retained earnings, public and private reserves, provisions, and valuation adjustments. Capital includes : tier 1 capital (paid-in shares and common stock) - a common feature in banking machines in all countries - and total statutory capital, which includes several specific types of subordinated debt instruments that do not need to be repaid if funds are required to maintain minimum levels of capital (they comprise tier 2 and 3 capital). Total assets include all financial and non-financial assets.

Table (04): Capital development in Italian banks for the period (2007-2020)

Years	Banks' capital in Italy
2007	4,60%
2008	4,10%
2009	4,80%
(2010).	5%
Since 2011	5,40%
Since 2012	5,40%
2013	5,40%
2014	5.90%
2015	6,20%
2016	5,50%
(2017).	6,60%
(2018).	6,30%
2019	6,70%
(2020).	6,60%

Source: Prepared by researchers using the World Bank database at <https://data.albankaldawli.org/indicator/FB.BNK.CAPA.ZS?locations=IT&view=chart>

Through the above table, we note a rise in the capital of Italian banks, which reached 4.60% in 2007, and continues to rise and grow to reach 6.60% in 2020, and this is due to avoiding falling into financial crises in the future, and overcoming financial turmoil alone can be exposed to it without the help or intervention of the Central Bank. By increasing the reserve ratio and retained earnings.

3. Study Model :

The study model includes financial inclusion indicators (the number of ATMs, the number of bank branches, and the number of borrowers) as independent variables, while the capital indicator as a dependent variable, where at this stage the study model is estimated, interpreted and tested in order to test hypotheses, and make recommendations.

3.1. Introduction to the Model :

To determine the variables of the model, a significance test was conducted with a value of 0.000, confirming that the independent variables (ATMs, the number of bank branches, and the number of borrowers) are statistically significant according to the t-test (at a significance level of 0.10, $P \leq$). This implies that financial inclusion is a valid explanation for changes in bank capital.

To understand the relationship between financial performance (measured by the capital index as the dependent variable) and financial inclusion indicators (as independent variables), the Standard Error of the Estimate (SEE) was calculated to measure the dispersion of the model's variables. The SEE value of 0.34, a small value, reflects minimal errors between variables, suggesting that the multiple linear regression model is appropriate for the studied phenomenon as shown in the following table:

Table (05) : Definition of Financial Inclusion and Capital Model

Financial Inclusion and Capital Model : $\widehat{BC} = f(\widehat{M}_i) = f(\widehat{M}_1, \widehat{M}_2, \widehat{M}_3) = BC_0 + \gamma_1 \widehat{M}_1 + \gamma_2 \widehat{M}_2 + \gamma_3 \widehat{M}_3$
\widehat{BC} : The value of the dependent variable "financial performance of banks" estimated by the capital index:
BC_0 : the level of capital in the absence of indicators of financial inclusion ;
$\widehat{M}_1, \widehat{M}_2, \widehat{M}_3$: independent variables of capital which are respectively ATMs, number of bank branches, and number of bank borrowers ;
γ_1 : The marginal tendency of ATMs, which means that the higher the ATM by 1%, the better the capital γ_1 ;
γ_2 : The marginal tendency of the number of bank branches, which means that the higher the number of banks (per 100,000 adults) by 1%, the better the capital γ_2
γ_3 : The marginal tendency of the number of borrowers from commercial banks, which means that the higher the number of borrowers from commercial banks per 100,000 adults by 1%, the capital will improve by γ_3

Source: Prepared by researchers based on the hypotheses of the study and previous studies

3.2. Estimating and Testing the Financial Inclusion Model – Capital :

The following table summarizes the results of estimating the parameters of the financial inclusion and capital model :

Table (06): Results of estimating the parameters of the financial inclusion and liquidity model

$$\widehat{BC} = f(\widehat{M}_1, \widehat{M}_2, \widehat{M}_3)$$

	Parameter Value	Error associated with T-test Sig. t	Coefficient of determination R ²	Correlation coefficient	Error associated with F(F-test)Sig test
BC_0	8.	0.03	86	92	0
γ_1	0.100	0.01			
γ_2	0	0.96			
γ_3	24	39.00			

Source : Prepared by researchers based on the outputs of the spss program

From the previous table, the estimated model can be formulated $\widehat{BC} = f(\widehat{M}_1, \widehat{M}_2, \widehat{M}_3)$, in addition to providing the following analyses:

The estimated model of the relationship between financial inclusion and capital takes the following formula:

$$\widehat{BC} = 8.83 - 0.100M_1 + 0.000M_2 + 0.24M_3$$

Where:

- **$BC_0 = 8.83$** : The initial value of capital in the absence of financial inclusion indicators in Italian banks.
- **$\gamma_1 = -0.100$** : Indicates that when ATMs increase by one unit (assuming other variables remain constant), the capital level of Italian banks, as a measure of financial performance, decreases by 0.100.
- **$\gamma_2 = 0.000$** : Suggests that an increase in the number of bank branches per 100,000 adults (assuming other variables remain constant) has no significant impact on capital.
- **$\gamma_3 = 0.24$** : Implies that an increase in the number of borrowers from commercial banks per 100,000 adults (assuming other variables remain constant) leads to a capital improvement of 0.24.

$R^2 = 0.86$: Indicates that 86% of the changes in capital improvement can be explained by the independent variables (ATMs, number of bank branches, and number of borrowers), with the remaining 14% attributed to other random factors.

Correlation Coefficient $R = 0.92$: Demonstrates a strong positive correlation between the independent variables (financial inclusion indicators) and the dependent variable (capital).

F-test: The error associated with the F statistic is 0.000, which is less than 0.05, confirming the model's high explanatory power and acceptance.

Conclusion:

This study investigated the impact of financial inclusion on the financial performance of Italian banks, specifically focusing on the capital index from 2007 to 2020. Financial inclusion is crucial for banks, as it ensures that all individuals, regardless of social status or geographical location, have

access to the financial services they need at reasonable costs. Financial inclusion encompasses three main dimensions: access to financial services, usage of financial services, and the quality of financial services.

By analyzing the indicators (ATMs, the number of bank branches, and the number of borrowers), the study found that financial inclusion positively impacts the capital of Italian banks. The main hypothesis, which suggests that financial inclusion significantly affects the capital level of Italian banks at $\alpha = 0.05$, was supported by the findings. Specifically, the prevalence of ATMs showed a significant positive impact on bank capital, while the number of bank branches and borrowers had a positive but not significant impact.

Based on the findings, the study recommends the following:

1. **Promote Electronic Banking:** Facilitate access to financial services by enhancing electronic banking and investing in its development, such as through mobile banking.
2. **Financial Education:** Raise awareness among future generations about the importance of financial inclusion in achieving development goals, particularly for low-income people and individuals in rural and remote areas.
3. **Modern Banking Methods:** Improve bank capital by introducing modern methods and technologies in banking and attracting customers by providing financial services at reasonable costs for all individuals.

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