Master of Science (MSc) ZFH in Accounting and Controlling

Unpacking the Impact of Inflation on Corporate Financing: An Empirical Analysis of Bank Lending and Corporate Bond Issuance in Europe's Major Economies

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I MANAGEMENT SUMMARY

The present investigation poses a significant challenge to the prevailing theories that posit risk-averse behavior among corporations during inflationary periods, with companies resorting to rationing investments and expenditures related to capital financing and debt. In contrast, the study reveals a captivating narrative of companies expanding their production activities and significantly leveraging debt capital compared to pre-inflationary periods. This paper delves into the depths of the matter to truly comprehend the underlying reasons that drive companies' increased debt-taking amidst inflationary pressures.

Furthermore, the study endeavors to scrutinize the preferences of companies for financing debt during inflationary periods, specifically whether they prefer bank loans or corporate bonds. On this note, the study unearths compelling evidence suggesting that during the present inflationary phase, firms demonstrate a greater propensity for bank debt, particularly in countries such as France and Germany, where the banking sector has not been afflicted by structural crises. In Italy, however, this phenomenon is not readily discernible due to the state of the banking sector and the country's overall economic landscape. At the aggregate level, the fixed effects panel model provides notable insights: a 1% increase in the inflation level corresponds to a 4% increase in loan issuance volumes and a 9.7% decrease in bond issuance volumes.

Several reasons could have motivated companies to prefer bank debt, including the relative costs of loans, which have now fallen below the average corporate bond yields, as highlighted by an analysis by the Bank of France (Banque de France, 2023). However, other technical aspects may have also played a pivotal role in influencing these preferences, such as the duration of issuance and the flexibility in the conditions for debt repayment. In periods of economic turbulence, characterized by surging demand and skyrocketing material costs, companies often find themselves in urgent need of funds to finance the operative activities, seeking financing options that provide flexibility and allow for penalty-free repayment if economic conditions shift. In this context, bank loans offer a set of technical features that are particularly well-suited to these needs. With faster average issuance times compared to bonds, coupled with the ability to repay the loan early without incurring penalties, bank loans offer companies a level of agility and

responsiveness that is highly valued in today's fast-paced and rapidly changing business landscape. Upon analyzing multiple studies conducted by the national banks of the three countries under consideration, a clear trend has emerged indicating a significant surge in demand for short term bank loans. This observation may once again suggest that companies are actively seeking financial instruments that offer greater flexibility, as opposed to corporate bonds whose issuance process is often linked to lengthy bureaucratic procedures and whose maturity frequently exceeds a year (Schildbach, Schattenberg, & Schneider, 2022).

To gain a more in-depth understanding of these aspects, a T-test was conducted to scrutinize the needs that prompted companies to absorb new debt during the inflationary period. The findings indicate that many companies are requesting bank loans to finance working capital and inventories, suggesting a growing demand for such financing options. This general trend is also supported by an aggregate analysis of 1,646 companies operating in diverse sectors across France, Germany, and Italy, revealing a rise in inventories' balance sheet positions and an increase in the level of debt concurrent with working capital and revenues.

The aforementioned evidence is intriguing, revealing how the post-pandemic period saw a surge in aggregate demand across various sectors, prompting companies to operate at maximum capacity. However, challenges such as supply chain slowdowns and bottlenecks have cast doubts on companies' ability to produce and then efficiently deliver finished products to the market. In light of this, many companies have opted to expand their inventories, thereby exerting greater control over production and sales volumes. Moreover, given the expectation that the general price level will continue to ascend, firms are seeking to maximize the margin gap by purchasing goods at current prices, which they can later sell at higher prices amid the ongoing inflationary pressures. This strategy allows companies to further capitalize on the favorable market conditions and potentially reap higher returns.

Finally, the arduous years of the COVID-19 pandemic have taken a heavy toll on companies' internal resources, including their profits and operating liquidity. As a result, many companies are now turning to external sources of financing to face the challenges presented by the current inflationary landscape, a trend that is being fueled in part by

government aid in the form of non-repayable loans and bank loan guarantees for struggling companies. By leveraging these external funding sources, companies can bolster their financial resilience and position themselves for long-term success in an uncertain and rapidly evolving economic climate.

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V. LIST OF ABBREVIATIONS

BLS	Bank Lending Survey
bn	Billion
CB	Central Bank
CSPP	Corporate Sector Purchase Program
EMU	European Monetary Union
ERICA	European Records of IFRS Consolidated Accounts
EU	European Union
EUR	Euro
GDP	Gross Domestic Product
GFC	Global Financial Crisis
HICP	Harmonized Consumer Price Index
JIT	Just in Time
NFC	Non-Financial Corporation
OLS	Ordinary Least Squares
PEPP	Pandemic Emergency Purchase Program
PSPP	Public Sector Purchase Programs
Q4	Fourth Quarter
SAFE	Survey on the Access to Finance of Enterprises
SME	Small and Medium Enterprise
SVB	Silicon Valley Bank
USD	United States Dollar
WACC	Weighted Average Cost of Capital

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1 INTRODUCTION

In the wake of the subprime financial crisis that rocked the Eurozone in 2008, the European economic landscape was characterized by low benchmark interest rates and moderate, stable inflation. This situation aligned perfectly with the European Union's (EU's) objectives, which have always aimed to achieve an average midterm inflation level of around 2% (Grauwe, 2019). However, in 2021, this state of affairs underwent a sudden and near-total reversal, with inflation levels surging or galloping in most Western developed economies. The political and media scenes were soon awash with record-breaking inflation numbers, with Italy hitting peaks of 12.3%, Germany 9.6%, and France 6.7% (ECB Data warehouse, 2023). This phenomenon immediately drew public attention and sparked fear among governments and institutions, who saw the rise in general market prices as both a warning sign of an impending recession and an inevitable loss of purchasing power. Moreover, what has contributed most to the feeling of insecurity is that the upsurge in consumer prices materialized rapidly, leading to the fastest inflation in a generation, and unexpectedly so, as no one could predict its advent using standard economic models employed for forecasting in the public and private sectors (Furman J., 2022).

Central banks (CBs) have sought to react to this turmoil and have adopted restrictive monetary policies to bring inflation levels back to normalcy by selling securities or withdrawing money from the market to help raise average short-term interest rates. Indeed, with the press release dated 14 April 2022, President Christine Lagarde officially announced that the European Central Bank (ECB) was ready to gradually increase the reference interest rates on the market, thus abandoning the negative interest rate policy that had persisted until March 2022, mainly introduced to counter deflation (ECB, 14 April 2022). In a more recent press release dated 15 December 2022, this strategy was strengthened by the Governing Council's decision to further increase the ECB's three primary reference interest rates by 50 percentage points. As a result of this decision, the interest rates on the main refinancing operations (EURIBOR and EONIA) and the interest rates on the marginal lending facility and the deposit facility would rise from December 2022 to 2.5%, 2.75%, and 2%, respectively (ECB, 15 December 2022).

The disruptions in the price market that have led to incipient and thunderous inflation, as well as the policies put in place by central banks to counter it, have completely transformed the context in which leading European economic agents conduct their activities. For companies in particular, inflation implies an increase in fixed and variable operating costs. Among these, there are the expenses related to raw materials and energy procurement, which, in most cases, the companies try to transfer downstream onto the final consumer to preserve the margin. In contrast, the increase in interest rates is more complex for companies to control and neutralize. It has unavoidable repercussions on the cost of capital, especially debt capital, and therefore affects the overall company value and, by extension, its valuation on the stock markets. This study aims to scrutinize the profound relations between these two current phenomena: inflation and skyrocketing interest rates, with corporate financing policies, through an extensive analysis of the capital procurement strategies of European companies. Particular attention will be paid to the core European countries such as France, Germany, and Italy. Although very different from each other in terms of structural characteristics, they are united by the fact that they represent the top three countries in terms of business volumes in the European corporate debt market. The main purpose is to shed light on how inflation and high-interest rates influence the financing preferences of companies and their pursuit of an optimal capital structure.

1.1 Structure of the research

The present study will commence with a thorough investigation of the initial context and overarching aim of the research. Chapter 1 will provide an overview of the altered European landscape in which companies operate, focusing on the challenges presented by interest rates and inflation in capital procurement channels. Furthermore, this chapter will furnish a concise overview of inflation and its principal characteristics, including the identification of the factors that have led to anomalous inflation over the past two years. The chapter will culminate in a discussion of the effects of this macroeconomic parameter on companies' operational and financial activities.

Chapter 2, which comprises the literature review, will delve deeper into the effects of inflation on the balance sheet of companies, with an analysis of various scholarly approaches that have tackled this subject. Specifically, Chapter 2.1.1 will explore the

assumption that high inflation results in a reduction in investment by firms, causing a substantial decrease in capital requirements. However, Chapter 2.1.2 will offer an alternative perspective by analyzing the triangulation between capital, inflation, and taxation, concluding that it could be advantageous for certain types of companies to contract debt capital even during times of inflation. Furthermore, Chapter 2.2 will summarize the corporate financial trends in Europe, tracing the history from the moment of the monetary union to the present and enumerating the most significant milestones of this evolutionary path. Chapter 2.3 will list the primary features of the literary trend known as multiple avenues of intermediation, along with numerous research papers that populate this literary school. Chapter 2.4 will review the previous sections, defining the current state of scientific discoveries regarding the substitution effect between bonds and loans and the gaps that require attention following the new macroeconomic developments.

Chapter 3 will reiterate the research's purpose and outline the various scientific hypotheses that will be tested to answer the central question of whether there is a substitution effect between bonds and loans in times of inflation in the three countries analyzed. Additionally, this chapter will discuss the statistical tests that will be performed to validate the different starting hypotheses. In Chapter 4, the results of the various statistical models will be presented, accompanied by detailed arguments.

Finally, Chapter 5 will provide the conclusions of this research, and Chapter 6 will present a critical appraisal of the research method, including the limitations of the applied methodology.

1.2 Initial scenario and problem definition

Inflation is a fundamental metric that reflects the economic health of a nation, and most central banks have adopted it as the primary objective of their monetary policies. For example, the ECB has set its main goal to maintain inflation at a target level of 2% (Grauwe, 2019). The phenomenon of inflation involves a sustained and constant increase in the general price level (Friedman, 1963). If P_{t-1} indicates the level of prices in the previous year and P_t indicates the level of prices in the current year, inflation can be conveyed by the following mathematical formula:

$$\pi = \frac{(P_t - P_{t-1})}{P_{t-1}}$$

Figure 1 Inflation formula.

The inflation rate, denoted as π and expressed as a percentage, is typically used as a measure to gauge the extent of inflation. Inflation, in turn, is commonly calculated by tracking the price fluctuations of a representative basket of goods, which constitutes the aggregate of goods and services consumed by households and businesses in a given geographical area. The short-term fluctuations of this basket can be measured by comparing the current month with the previous month of the same year, while long-term fluctuations can be estimated by comparing the same months across different years. The former yields are the so-called *conjunctural rates*, whereas the latter generates the so-called *trend rates* or *tendential rates*.

The present work focuses on the HCPI, or Harmonized Consumer Price Index, which is employed by the EU to compare inflation levels across member countries, both for access and residency purposes. To facilitate cross-border comparisons, all EU countries employ identical categories of goods and services, as well as a consistent calculation methodology.

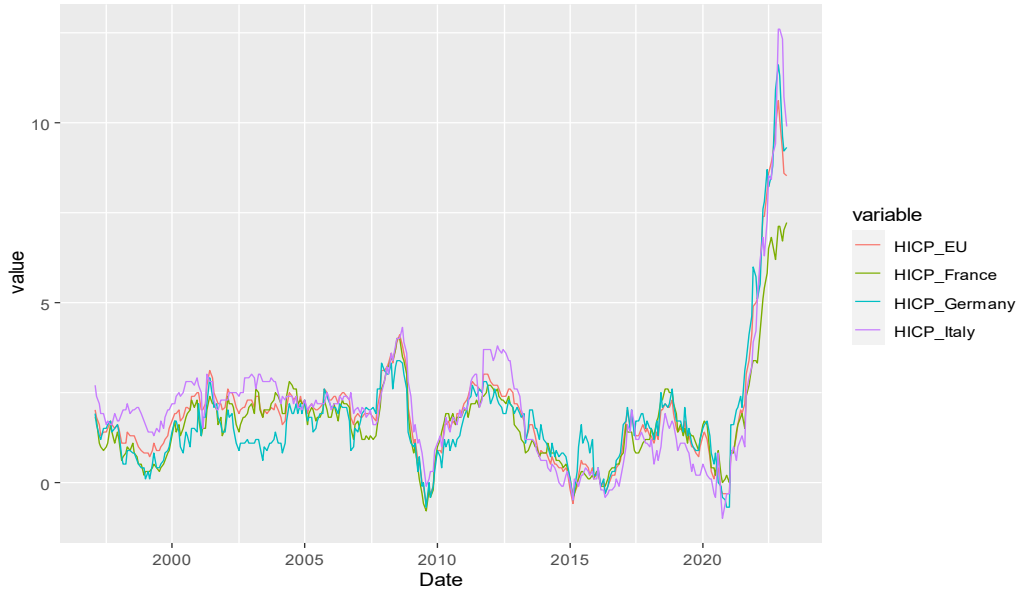


Figure 2 Evolution of inflation in Europe and in some of the main EU countries -Italy, France, Germany- between 1997 and 2022. Data derived from the ECB data warehouse. (Own illustration).

When considering the evolution of HCPIs in Europe over the past 25 years, it becomes evident that the values have remained relatively stable, hovering between 0 and 2%. From January 1997 to December 2020, the distribution of inflation values across European countries yielded an average of 1.61 and a standard deviation of 0.92. However, upon incorporating the values from January 2021 to December 2022 into the analysis, the population displays a mean of 5.48 and a standard deviation of 3.32 (ECB Data warehouse, 2023). Comparing these values and analyzing the corresponding figure, it becomes evident that the last two years have been characterized by anomalous levels of inflation, reaching unprecedented peaks in the entire history of the European Monetary Union (EMU).

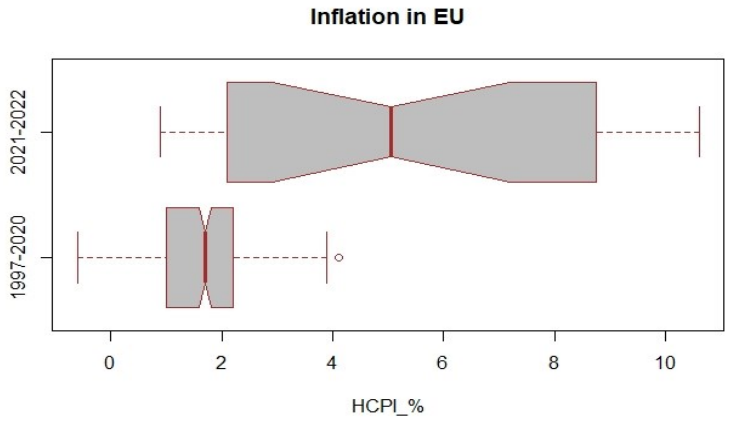


Figure 3 Whisker plot of inflation rates: comparison between the years 1997-2020 and 2021-2022. Data derived from the ECB data warehouse. (Own illustration).

The causes that have led to such a condition are many and according to a meticulous analysis conducted by the ECB can be traced back to intrinsic dynamics of demand and supply.

- The first factor that contributed to the onset of an increase in prices was undoubtedly the pandemic crisis. This contingency has caused an interruption in the production of goods and services due to repeated and stringent lockdowns. With the progressive return to normality, the global supply chain has not been able to keep the pace and to recover the now profound gap it has with the increased aggregate demand. The willingness of companies to satisfy the abundant demand has caused bottlenecks and slowdowns in the supply chains with consequent increases in production and transport prices. A good portion of companies have

not absorbed these price upsurges in the business-to-business sphere but have passed them downstream to the final consumer at a later stage (ECB, 16 November 2021).

- The growth in prices in the energy sector and food industry and that of some critical raw materials is also the trigger of today's inflationary crisis. The rise in energy prices reflected the increases in oil prices quotations and, above all, in the European context, of the increases in natural gas. According to recent data, the average gas prices in the EU witnessed a surge from 7.0 EUR per 100 kWh in the second half of 2020 to 7.8 EUR per 100 kWh during the same period of 2021 (Eurostat, 29 April 2022). The Russian-Ukrainian conflict finally exacerbates an already fragile and partially compromised situation. Since the outbreak of the war in February 2022, the prices of some food, mining, and especially energy goods have continued their rapid climb because the two countries, which have always been strong exporters in these sectors, have limited their regular production activity or, in the case of Russia, have been barred from international trade because of severe embargo impositions (ECB, 16 November 2021).
- The last aspect that affected inflation was the increase in raw material prices driven by a new trend: the so-called "*Greenflation*". The ecological tension is now upon us, and many companies are trying to rejuvenate their production models to make them more sustainable. The massive use of green technologies is increasing the demand for some essential metals and minerals necessary to realize these technologies, such as copper, lithium, nickel, cobalt, and neodymium (Gielen & Papa, 2021). The same resources are employed more generally in the tech sector. Due to the vigorous demand directed towards these categories of goods, there have been significant markups in the supply of those resources (ECB, 16 November 2021).

Therefore, a significant increase in general prices has arisen from the intertwining of dynamics inherent in demand and supply. If we look beyond the causes that can be disparate and linked to the specific historical contingency, the effects and costs that inflation brings with it are relatively predictable and systematic. Although the phenomenon affects all the agents of a given economic ecosystem without distinction, from the state to banks to households, in this section, priority will be given to a more

accurate examination of the inefficiencies or costs that companies must bear in such a condition. Among the classic costs included in the theory, we can mention the shoe-leather costs and menu costs. Both types of costs fall on the shoulders of the enterprises, but it should be emphasized that their impact is only marginal if related to the total operating costs of the companies.

- With shoe-leather costs, it is suggested that inflation causes a rise in nominal interest rates, increasing the opportunity cost of holding paper money. This aspect provides a disincentive to accumulating cash which will progressively lose value over time. For this reason, savers will be induced to go to the bank frequently to withdraw cash, boosting current spending and consumption or trying to reinvest the money in more profitable forms (Pakko, 1998).
- The other costs that arise in the event of marked inflation are the so-called menu costs since the increase in general prices requires frequent updating of the prices referring to the individual products. However, they are effective only in cases of hyperinflation (Gorodnichenko, 2008).
- One of the most distortive effects of inflation concerns the redistribution of wealth from creditors to debtors. In fact, if we consider that under the effect of inflation, money gradually loses value over time, a loan granted today will undoubtedly have a lower value tomorrow if repaid at nominal value. In the event of extreme inflation, many creditors may decide to apply an additional interest rate to cover the erosion of money value and to bind the debtor to repay the loan amount at its real rather than nominal value (Fischer & Modigliani, 1978). From the point of view of companies, this effect could encourage financing with third-party capital even if, very often, inflation is combated by the central banks with an increase in interest rates which, on the contrary, raises the cost of money and make less attractive in general to contract debt. These two effects induce companies to behave in diametrically opposite ways, and it should therefore be assessed which of the two has a more significant impact in magnitude.
- Inflation can also manifest itself in production through what is commonly referred to as an "inflation gain". This occurs when firms purchase raw materials during an earlier period and subsequently sell them in the final market at a higher price due to inflationary pressures (De Alessi, 1964).

As already mentioned, for CBs, it becomes essential to try to contrast and contain the effects associated with inflation. One of the tools they most often use for this purpose is manipulating interest rates. In fact, the latter consists of the cost of money, or the remuneration applied to different types of activities such as loans, purchase and sale of securities, shares, etc., and can decisively influence the choice of economic agents to either hold liquidity or make investments. In general, during periods of expansionary monetary policies, CBs tend to lower interest rates to encourage investments and economic growth, while in contexts characterized by high inflation, on the contrary, restrictive monetary policies are applied, whereby interest rates are raised to slow down spending and encourage savings. In the long run, this leads to a drop in aggregate demand, which could reshape prices downwards, breaking the inflationary spiral (Stawska & Mourao 2021).

The central bank of Europe has already mobilized in this direction. Already on December 15 of last year, a press release announced the rise in deposit interest rates by 50 percentage points to bring it to values of 2%. This policy was also strengthened by President Lagarde's direct and transparent utterances, who announced that the rate hike path would proceed at a "constant" pace for the next 4-6 months. Translated into numbers, this would lead to achieving a deposit rate level of 4% in June 2023.

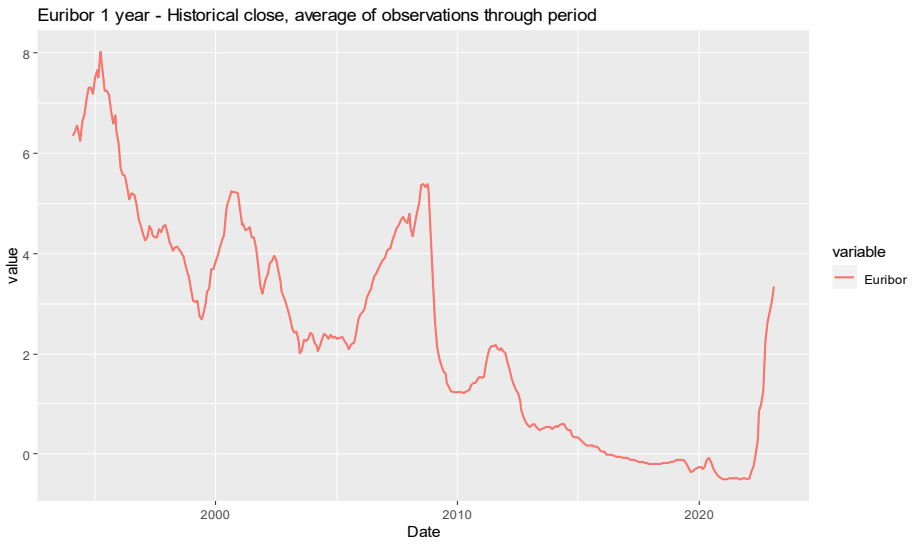


Figure 4 Evolution of the one-year long-term ECB Euribor benchmark reference rate. Years 1994-2022. Data derived from the ECB data warehouse. (Own illustration).

As can therefore be seen from the graph, the Euribor benchmark rate was raised during 2022 to levels above 2% with a maximum peak of 3%, touched in December 2022. The rise in the reference interest rates is transmitted over time to the real economy, influencing the rates applied to bank loans and those relating to the yield curve which regulate the dynamics of the bond markets.

2 Literature Review

2.1 The effects of inflation on the capital structure

2.1.1 Economic Slowdown: How Inflation Discourages Business Investment

By and large, it has been widely acknowledged in both common sense and an extensive corpus of literature that periods marked by pronounced inflation are accompanied by a significant decline in aggregate demand and corporate investments. This presumption stems from a multitude of factors but can primarily be attributed to three key reasons:

1. Primarily, a prolonged period of inflation has the effect of increasing production costs for corporations, including expenses associated with raw materials and the remuneration of employees. To counteract these developments, firms may adjust their pricing strategy in the final consumer market, thus mitigating the impact of inflation and avoiding a reduction in profitability. If such a solution is not feasible, companies may opt to scale back investment to preserve their financial viability.
2. The second reason that leads to a drop in investment is related to the demand. In fact, high levels of general prices often lead to a decline in aggregate consumer demand. This dynamic could discourage companies from making investments. With lower levels of turnover and profitability, disbursements would only be covered over a more extended period, increasing the risk of exposure linked to the initial outlay.
3. The third and last crucial reason is the interest rate increase. As mentioned, central banks counter inflation by adjusting interest rates upwards, which increases the average cost of debt, making it more difficult for companies to bear the cost of debt capital.

Several studies have corroborated this hypothesis and disentangled the effects of inflation on the level of investment made by firms. Fischer, for example, shows that high inflation

rates instill uncertainty about costs and prices in the future and therefore represent a deterrent for firms to invest capital (Fischer, 1993). Bruno and Easterly echo Fischer's propositions and remark on how high inflation rates increase capital costs and reduce project investments' profitability since future cash flows are discounted with a higher Weighted Average Cost of Capital (WAAC). This fact dissuades certainly companies to invest (Bruno & Easterly, 1998). Jalil and Feridun find proof of declining investment in Pakistan amid inflation. They argue that high inflation levels increase the cost of borrowing and decrease credit availability by compressing the investments level (Feridun & Jalil, 2011). Finally, Ozturk and Karagoz apply this assumption to the Turkish reality and, in this context, discover with statistical significance that inflation increases the uncertainty of the economic agents, leading companies to squeeze capital spending (Ozturk & Karagoz, 2012).

Tracing the lowest common denominator of these studies, inflation's effect on the balance sheets of companies could be to reduce their assets and liabilities or at least to freeze their values. In fact, on the active side of the balance sheet, if investments linked to the implementation of new projects are excluded, only the investments made to maintain the assets or replace those no longer performing keep the values stable. On the other side of the balance, capital does not increase mainly due to rising costs. This is true for debt capital subject to price increases due to rising interest rates in the banking and bond markets by central banks and for equity capital.

Although the relationship between inflation and the cost of equity is not as clear-cut as the relationship between inflation and the cost of debt, inflation can impact equity costs through several channels. Inflation could affect equity costs by raising the risk premium investors demand. Indeed, inflation erodes the real value of future cash flows and increases the uncertainty of their correct forecasts. To compensate for the increased risk and the erosion of the cash flows value, shareholders could demand a higher rate of return. However, the relationship between inflation and the increase in the cost of equity is less well-established and transparently documented than between inflation and the cost of debt.

2.1.2 Inflation and the tax advantages of capital

The interpretation key presented in the preceding chapter is undoubtedly the most obvious one, but a more nuanced perspective sheds light on other dimensions, which render it advantageous for firms to increase their debt levels during inflationary periods. As has already been addressed by the specific literature, inflation levels exert a particular impact on the preferences of companies on how to procure capital.

One possible scenario that is painted by many economists concerns unexpected inflation. When this materializes, at least in the first period, there is insufficient time to adjust the loan interest rates. This constellation of aspects: high inflation on the one hand and low interest on the other creates *ceteris paribus*, the perfect basis for a transfer of wealth from lenders to debtors, and therefore constitutes an incentive for companies to increase the leverage level (Cebenoyan, Fischer & Papaioannou, 1995).

However, this position concerning expected inflation or unexpected inflation that has already become evident with constancy and persistence over a certain time, is a weak one to sustain. In this case, the money lenders will dispose of the necessary information to adjust the interests. In doing so, they will neutralize the effect described above, i.e., a flow of economic resources from lenders to debtors.

In addition, there are various factors that may influence a company's preference for debt financing over equity financing. One of the most prominent among these is the tax implications, which have captured the attention of many scholars who have investigated the concept of optimal capital structure.

Modigliani and Miller were the pioneers in this line of inquiry, who, by refining the second proposition, rejected one of the fundamental assumptions of the corporate finance theory formulated in 1958, which was a landmark theory in the field. They emphasized the importance of taxes in the pursuit of an optimal capital structure, arguing that debt capital could be an attractive source of funding for companies due to the tax shield and the deductibility of financial charges (Modigliani & Miller, 1963). However, empirical evidence has revealed that firms tend to maintain lower levels of debt than the optimal level predicted by theory.

This has made it clear that the theories proposed by Modigliani and Miller were still too abstract and detached from reality, particularly regarding the starting assumptions, such as the efficiency of reference markets (Singer, 2000). Miller himself addressed this issue in 1977 by expanding upon the work done on the second proposition and providing a more comprehensive analysis of the tax implications of capital structure decisions. He started from the assumption that if a scenario characterized by corporate taxation is theorized, completeness must consider the existence of taxation on investors' income in parallel. In such an arena, the tax levied on these economic subjects could induce them to request a more conspicuous gross remuneration than when such incomes are not taxed. Hence, from the company's perspective, the advantage deriving from the tax-deductibility of interest on borrowed capital is counterbalanced by the amount of personal income taxes. Miller, therefore, constructs a model where the gross returns of stocks and bonds are compared. If we assume a tax system in which both types of income are taxed, the interest on both instruments paid by companies must be of such a nature as to make the instruments equally interesting for investors. The alternative would be that of an inefficient market in which the gap would be equalized over time through a massive purchase of the most favorable instrument, reducing its price. If all these conditions are met (taxation of both income on bonds and shares and the existence of efficient markets), two possible scenarios emerge:

1. In the first one, taxes on equity income outweigh those on income from the bond market. In this case, it is advantageous for firms to increase the level of leverage because they will equalize the gross income on equity for investors with less economic effort, hence, through the provision of a lower coupon payment on the bonds.
2. In the second one, when the tax rate on income from shares is less than the tax on income from corporate securities, the advantage deriving from the deduction of debt will progressively decrease until it vanishes (Miller, 1977)[1].

1 Miller models these implications in the following formula: $G_L = \left[1 - \frac{(1-\tau_C)-(1-\tau_{PS})}{(1-\tau_{PB})}\right] B_L$ where G_L is the gain from leverage, T_C is the corporate tax rate, T_{PS} is the personal income tax rate

De Angelo and Masulis refer to this publication by Miller and create a comprehensive model that also contemplates substituting tax shields for debt, such as accounting depreciation and investment tax credit. Indeed, in addition to the financial charges, the most interesting categories for tax deductions are undoubtedly the depreciation and depletion allowances or, more generally, all the items falling under the category of non-cash expenses. These accounting entries often outclass the debt interests in importance, making them almost redundant for deductibility (De Angelo & Masulis, 1980). According to these scholars, introducing a more complex model that includes and contemplates all accounting entries relevant for tax purposes leads to the conclusion that there is a "unique interior optimum leverage decision" for every single company. This results from the balancing act between corporate taxation and personal income taxation, hence between taxes relating to equity capital and debt.

This preamble or in-depth analysis relating to fiscal discipline and its influence on capital procurement decisions maintains strong connections with inflation. Cohn and Modigliani are the first to perceive the logical association (Modigliani & Cohn, 1984). From the point of view of the two scholars, the efficiency of the tax shields used by a company changes according to the price level. When a company encounters high inflation, the nominal income realized will advance, and the effectiveness of the tax shields related to depreciation will diminish, as they are commonly derived from the historical values of the asset entered into the balance sheet at the activation time. On the other hand, while the advantage deriving from depreciation and amortization weakens, there is a boost in the effectiveness of the tax shields connected to the debt. The two scholars show how in the presence of deductible interests, the actual unit cost of the debt K can be conveyed through the following equation:

$$K = (1 - \tau)k - i = (1 - \tau)k^* - \tau_i$$

Figure 5 Formula representing the unit cost of debt capital and the benefits deriving from the tax shield and inflation. (Cebenoyan, Fischer & Papaioannou, 1995).

applicable to income from common stock, T_{PB} is the personal income tax rate applicable to income from bonds and B_L is the market value of the levered firm's debt.

Where k* represents the real interest rate; k is the marginal interest rate; i is the inflation rate, and τ the marginal corporate income tax rate. As the formula demonstrates, early repayments of debt capital (in the form of interest to banks or coupons paid to bondholders) that correspond to higher nominal inflation-adjusted rates are tax deductible. For this reason, therefore, as inflation increases, the tax advantage is maximized, and the cost of debt diminishes in parallel. Even if there is no transfer of wealth from creditors to debtors, increasing the level of leverage is still interesting for companies to optimize the tax burden. Furthermore, aggressive inflation in the economic markets could also affect managers' choices regarding the level of maturity and the duration of the debts. Indeed, corporate assets can be financed through long-term debt or a chained sequence of medium- or short-term loans. Modigliani and Cohn rewrite the previously illustrated formula to express the cost of short- and long-term debt in more detail:

$$\tilde{\kappa}_{t,l} = (1-\tau)k_l - \tilde{\imath}_t = (1-\tau)(k_l^* - i_l) - \tilde{\imath}_t$$

$$\tilde{\kappa}_{t,s} = (1-\tau)\tilde{\kappa}_{t,s} - \tilde{\imath}_t = (1-\tau)\tilde{\kappa}_{t,s}^* - \tau\tilde{\imath}_i$$

Figure 6 Short- and long-term unit cost of debt (Modigliani & Cohn, 1984).

In the equations described above, the tilde symbol marks the mathematical terms with a stochastic trend, and the letters l and s suggest the long and short term, respectively. The unit cost of long-term debt is, therefore, a function of the long-term interest rate (non-stochastic) and the long-term inflation rate (also non-stochastic) minus the inflation rate recorded when calculating the debt cost. The formula can be rewritten by synthesizing the real interest rates and the inflation rate into the nominal interest rate, k_l, without changing their meaning. On the other hand, however, in the formula for computing the short-term debt unit cost, real and nominal interest rates become stochastic variables. The formula to calculate the incremental cost of long-term unit debt over the short-term one is the following:

$$\Delta K_t = (1-\tau)\left[\left(\tilde{\kappa}_l - k_{t,s}^*\right) + \left(i_l - \tilde{\imath}_t\right)\right]$$

Figure 7 Incremental cost of long-term unit debt over the short-term. (Cebenoyan, Fischer & Papaioannou, 1995).

The equation assesses that the incremental cost of long-term debt relative to short-term debt is a function of the expected difference between the real interest rate and long-term inflation and the real interest rate and short-term inflation (Cebenoyan, Fischer & Papaioannou, 1995). For this reason, if we dissect the ultimate meaning of this formula, it results that the choice of a company to take out either a short or long-term loan strictly depends on the company's expectations regarding the long-term inflation rate. In particular, companies will be incentivized to take on long-term debt if they expect inflation to ascend. Conversely, they will be interested in taking on short-term debt if they expect a decline in inflation rates (Leuthold, 1981). To gloss over these literary visions, the finding of this strain of research could be summarized in two macro assumptions: companies will make greater use of debt, particularly long-term debt, with rising inflation rates. In general, there are several reasons why companies would find an advantage in increasing debt with longer maturities in a period denoted by aggressive inflation. Among these:

1. *Lower long-term borrowing costs:* During inflationary periods, banks may raise interest rates on loans. However, long-term debts are often subject to fixed interest rates and could therefore represent an exception. Companies may consider taking out long-term loans for lower interest rates rather than short- to medium-term ones.
2. *Inflation protection mechanism*: Inflation can erode the value of money over time. Because of that, some companies may decide to take out long-term loans to protect their purchasing power over time. In this way, if inflation continues to climb, it will drag up the prices of goods and services, but the face value of the debt will remain frozen, thus making it easier for companies to repay their debts.

Among the research papers that highlight this trend, we note that of Ghysels and Klein, whose paper demonstrates that investment-grade issuers tend to increase their long-term debt when inflation rates are on the rise (Ghysels & Klein, 1996). A further study by Hassan and Abidin finds evidence that inflation strongly correlates with corporate debt's maturity, especially in companies with high future growth prospects (Hassan & Abidin, 2001). Generally, the increase of firms' long-term debt during inflation periods depends on their financing and investment strategies. However, increasing debt can also lead to grander financial and default risks. In a recent study published in 2022, Nguyen and Wald

explore the relationship between the duration of the debt contracted and the selection of whether to resort to bank or bond financing. As an index of debt maturity, they use firms' asset maturity and effective tax rates to instrument for debt maturity. The result of the analysis clearly shows that the causal relationship exists in both senses, i.e., long-term debt tends to be financed through recourse to bonds and medium-short-term debt through bank intermediation. In consistency with what is suggested by the information asymmetry and agency cost theories, all the enterprises that increase the duration of the contracted debt by one standard deviation show a 30% less probability of selecting a bank loan. On the other hand, the companies that favor bank debt display, on average, a debt maturity of fewer than 70 months (Nguyen & Wald, 2022). However, if this is the premise, an issue remains to be clarified: which financial instruments do companies prefer in times of prevailing inflation? It will therefore be further investigated whether, in periods characterized by high inflation, it might be more functional and strategic for companies to resort to the more classic bank debt or to draw debt capital directly from the markets through the issue of corporate bonds.

2.2 Corporate financial trends in the Eurozone

If we analyze the financing choices of companies in the European panorama, the first milestone to be considered is undoubtedly the introduction of a single currency. This event primarily eliminated the risk deriving from exchange rates for transactions outside the borders of the various countries and laid the foundations for the advent of a pan-European financial market of comparable size to the American one (Kaya & Wang, 2016). The introduction of the single currency was, therefore, one of the primary triggers that favored the development of an advanced financial market, leading to greater integration and interaction of the economies of the various EU countries and promoting the use on a large scale of more "innovative" financial instruments for the European context such as that of corporate bonds. A pioneering study in this sense was conducted by Rajan and Zingales, who dealt with understanding the impact of a single currency in Europe in terms of modernizing corporate finance (Zingales & Rajan, 2003). In particular, the two scholars concentrated their attention on the impact of the single currency on the level of corporate debt securities issuance, and performed a comparative analysis between European countries that introduced the single currency and those that remained pegged to individual national currencies. The two scholars found evidence that the introduction

of the EUR had a statistically significant impact on the issuance of bonds, almost tripling the volumes in circulation on the market. Before the introduction of the EUR, companies were, in fact, more reluctant to issue large volumes of long-term bonds in foreign currencies due to the impact of the exchange rate on coupon payments and on the nominal value at the maturity time of repayment. These random, uncertain, and volatile aspects exposed them to a significant risk of possible losses deriving from exchange rates. The alternative was to issue bonds in national currency, but the large potential institutional investors were represented by macroscale pension funds which in turn were exposed to exchange rate risks. The introduction of the EUR therefore broke this impasse by opening up the potential of the debt securities market in the private sector (Zingales, & Rajan, 2003). Indeed, the ambition of a European market, in a nutshell, was to evolve in the direction of the more integrated and advanced US market in terms of traits and characteristics. To tell the truth, it is necessary to confirm that this gap does not seem to be fully filled. Even today, American companies rely more heavily on the financial and bond markets than comparable European firms do.

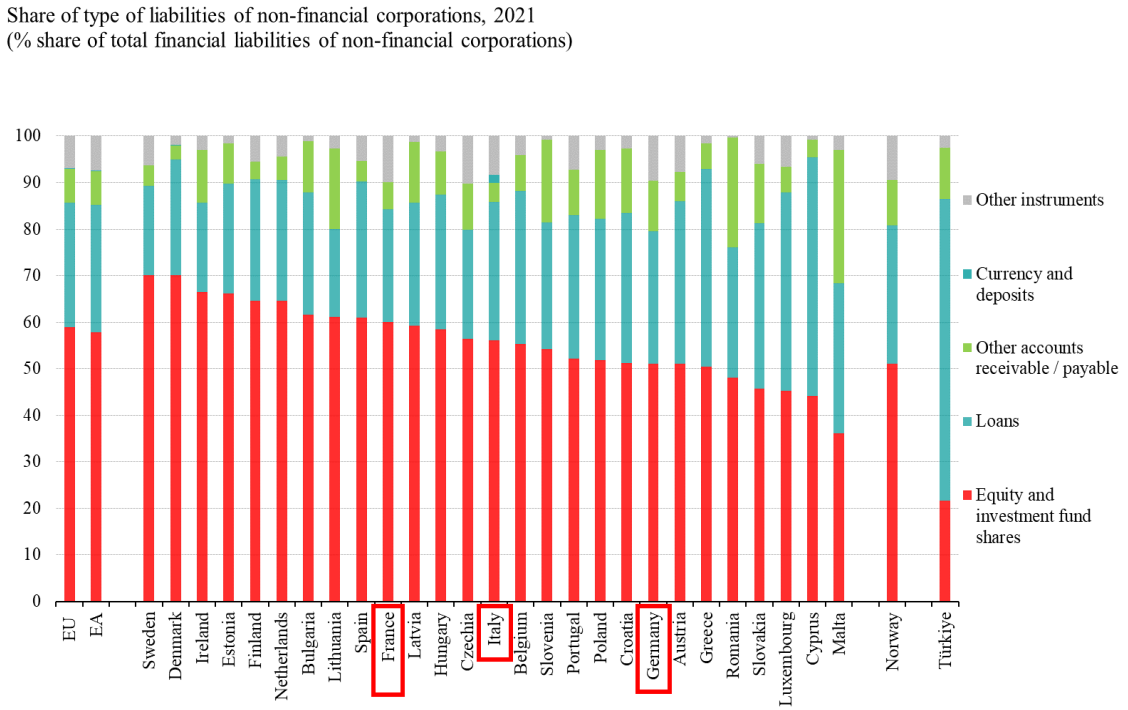


Figure 8 Share of type of liabilities of NFC in Europe, 2021. Share in %. Eurostat. (Own illustration).

Type of Liability	***Q4 2021***
Nonfinancial business; total liabilities	35'345.5
Nonfinancial corporate business; debt securities; liability	7'390.4
Nonfinancial corporate business; commercial paper; liability	138.2
Nonfinancial corporate business; municipal securities; liability	599.9
Nonfinancial corporate business; corporate bonds; liability	6'652.2
Nonfinancial business; loans; liability	11'150.6
Nonfinancial business; depository institution loans n.e.c.; liability	2'635.8
Nonfinancial business; other loans and advances; liability	2'744.1
Nonfinancial business; total mortgages; liability	5'770.7
Nonfinancial business; trade payables; liability	4'273.9
Nonfinancial business; taxes payable; liability	386.3
Nonfinancial business; intercompany debt; liability (market value)	335.2
Nonfinancial business; total miscellaneous liabilities	11'809.1
Nonfinancial corporate business; corporate equities; liability	51'949.0
Nonfinancial noncorporate business; proprietors' equity in noncorporate business	15'022.8
Nonfinancial business; foreign direct investment in U.S.; liability (market value)	11'288.3

Table 1 NFC in the USA. Outstanding amount at the end of the period (Q4 2021), bn USD; not seasonally adjusted. Liability per Type. Federal Reserve. (Own illustration).

Share of type of liabilities of non-financial corporations, 2021
(% share of total financial liabilities of non-financial corporations)

	Equity and investment fund shares	Loans	Other accounts receivable / payable	Currency and deposits	Other instruments
EU	59.0	26.7	7.2	0.2	7.0
EA	57.9	27.3	7.2	0.2	7.4
Sweden	70.2	19.2	4.3	0.0	6.4
Denmark	70.1	25.0	3.0	0.1	2.0
Ireland	66.4	19.3	11.3	0.0	3.0
Estonia	66.2	23.6	8.6	0.0	1.6
Finland	64.6	26.1	3.6	0.0	5.6
Netherlands	64.6	26.0	5.0	0.0	4.4
Bulgaria	61.5	26.3	11.1	0.0	1.1
Lithuania	61.2	18.8	17.3	0.0	2.8
Spain	61.0	29.2	4.4	0.0	5.4
France	60.0	24.2	5.9	0.0	9.9
Latvia	59.3	26.4	13.0	0.0	1.3
Hungary	58.5	28.9	9.3	0.0	3.2
Czechia	56.4	23.5	9.9	0.0	10.2
Italy	56.1	29.7	4.2	1.7	8.3
Belgium	55.3	32.9	7.6	0.0	4.1
Slovenia	54.2	27.3	17.7	0.0	0.8
Portugal	52.1	31.0	9.8	0.0	7.2
Poland	51.9	30.3	14.8	0.0	2.9
Croatia	51.1	32.4	13.9	0.0	2.6
Germany	51.1	28.4	10.8	0.0	9.6
Austria	51.1	34.9	6.4	0.0	7.6
Greece	50.4	42.5	5.4	0.0	1.6
Romania	48.1	27.9	23.6	0.0	0.4
Slovakia	45.8	35.4	12.7	0.0	6.1
Luxembourg	45.2	42.6	5.7	0.0	6.5
Cyprus	44.2	51.3	3.8	0.0	0.8
Malta	36.1	32.2	28.7	0.0	3.0

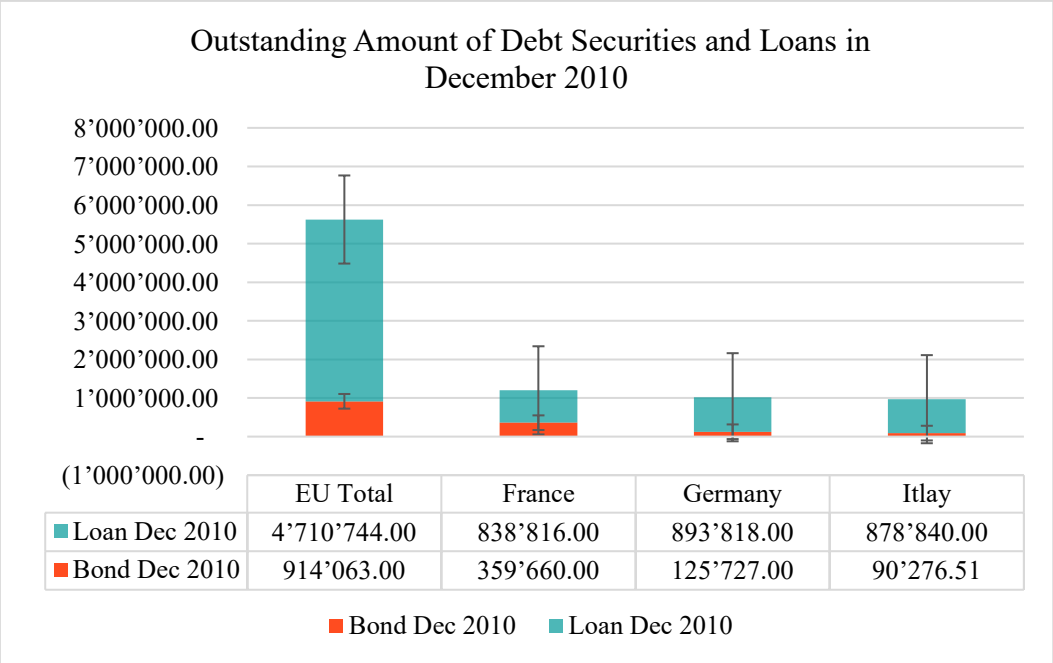
Table 2 Share of type of liabilities of non-financial corporations in Europe, 2021. Share in %. Eurostat (Own illustration).

Year	Total financial liabilities	Currency and deposits	Debt securities	Loans	Equity and investment fund shares	Insurance, pensions and standardised guarantees	Derivatives, employee stock options	Other accounts receivable payable
2011	22'726	26	979	8'445	11'062	355	94	1'765
2012	23'872	29	1'175	8'444	12'053	360	132	1'679
2013	24'984	30	1'240	8'277	13'244	365	113	1'716
2014	26'043	30	1'371	8'241	13'876	372	167	1'985
2015	28'305	33	1'396	8'675	15'527	377	156	2'141
2016	29'280	40	1'457	8'840	16'259	383	149	2'152
2017	30'454	42	1'534	8'887	17'307	393	113	2'178
2018	30'103	45	1'514	9'180	16'535	403	125	2'301
2019	32'992	47	1'666	9'404	18'814	414	127	2'519
2020	34'119	59	1'864	9'674	19'486	422	152	2'463
2021	37'922	64	1'950	10'122	22'366	429	258	2'733

Table 3 Type of liabilities of NFC, EU, 2011 vs. 2021, bn EUR. Eurostat. (Own illustration).

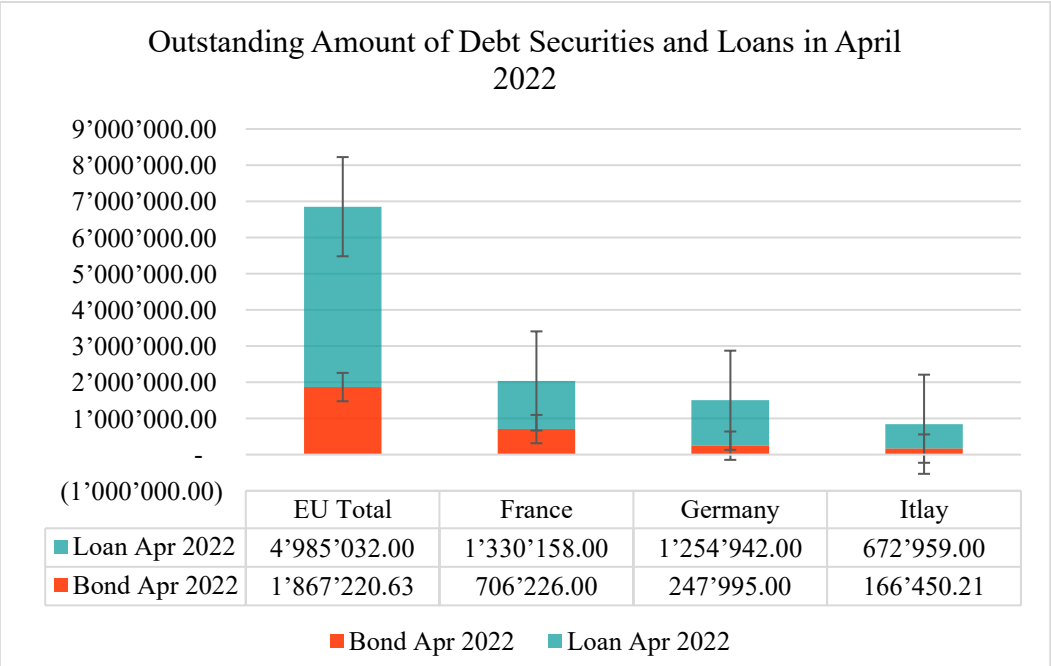
In fact, as it is discernible in *Figure 8*, the equity capital together with capital derived from bank loans still represent the cornerstone in the financial structure of European companies. However, the picture is in motion and, as suggested by *Table 3,* over the last decade we have witnessed the progressive emergence of financing instruments that in the past were relegated to a secondary role, such as that of debt securities. The photograph taken in 2009 suggested instead that the bond market represented 35% of the total US corporate debt market, while in Europe, it stood at a share of 13% (Darmouni & Siani 2021).

This disproportion has led to the term "bank-based" being coined to describe the European financial markets, and "market-based" designating the markets overseas. However, the image is not static but dynamic, and in recent years the European market has undergone profound changes also accelerated by the banking crisis that has hit the economy since 2008. Indeed, if we observe the evolution of the outstanding amounts of loans and debt securities relating to NFCs from December 2010 to April 2022, we can see how the balance between the two financial instruments has substantially redesigned, leading to a progressive weakening of the centralizing role played by bank loans in favor of bonds (ECB, Data warehouse).



	EU Total	France	Germany	Itlay
Loan Dec 2010	4'710'744.00	838'816.00	893'818.00	878'840.00
Bond Dec 2010	914'063.00	359'660.00	125'727.00	90'276.51

Figure 9 Outstanding amount of debt securities and loans in December 2010. Million EUR. ECB data warehouse. (Own illustration).



	EU Total	France	Germany	Itlay
Loan Apr 2022	4'985'032.00	1'330'158.00	1'254'942.00	672'959.00
Bond Apr 2022	1'867'220.63	706'226.00	247'995.00	166'450.21

Figure 10 Outstanding amount of debt securities and loans in April 2022. Million EUR. ECB data warehouse. (Own illustration).

Country	KF	Dec 2010	Apr 22	Growth in %
EU Total	Bond	914'063.00	1'867'220.63	104%
France	Bond	359'660.00	706'226.00	96%
Germany	Bond	125'727.00	247'995.00	97%
Italy	Bond	90'276.51	166'450.21	84%
EU Total	Loan	4'710'744.00	4'985'032.00	6%
France	Loan	838'816.00	1'330'158.00	59%
Germany	Loan	893'818.00	1'254'942.00	40%
Italy	Loan	878'840.00	672'959.00	-23%

Table 4 Growth rate of debt securities and loans (2010 vs. 2022): base year 2010. Million EUR. ECB data warehouse. (Own illustration).

This trend is readily discernible upon analysis of the outstanding amounts and long-term growth rates for two financial instruments throughout the years 2010-2022. Over the course of roughly a decade, the amount of outstanding bank loans has grown rather conservatively, reaching nearly 6%; conversely, the amount of outstanding debt securities has "exploded" with growth rates of 104%. This dynamic is evident at the European level and can also be observed within the context of the EU's core nations. A specific case in point is Italy, where not only is there a discrepancy in the growth rate of the two instruments, but also a marked and decisive contraction of the overall market for traditional bank loans can be discerned (ECB, Data warehouse, 2023).

The gradual but inexorable shift in NFC debt financing can be traced back to the subprime crisis and the financial bubble that burst between 2008 and 2009. This unprecedented event led to the introduction of a new regulatory framework for banks, known as Basel III, which aimed to enhance the resilience of the banking system against systemic shocks (Basel Committee on Banking Supervision, 2009). One of the most impactful measures introduced by Basel III was related to capital requirements, which imposed restrictions on the banks operating in the credit market. This rule mandated banks to hold a certain amount of equity capital commensurate with their exposure to risk, especially for activities related to the trading book or complex securitizations, which have been the source of substantial losses in the past. By adhering to the limits and minimum thresholds of equity capital, the following golden rules can be applied:

- Common Equity Tier 1 must always be at least 4.5% of the risk-weighted assets.
- Tier 1 capital must always be at least 6.0% of the risk-weighted assets.

- The total regulatory capital (Tier 1 capital plus Tier 2 capital) must always be equal to at least 8.0% of risk-weighted assets.

As evinced by the ensuing policies, capital and risk are two sides of the same coin, and each hazardous activity that a bank undertakes must be balanced by a corresponding level of risk coverage in terms of equity capital. With these profound changes, it has become increasingly "expensive" for banks to incorporate high-risk assets into their portfolios, resulting in a rationalization of credit activities or a tightening of credit standards (Basel Committee on Banking Supervision, 2009). Kaya and Wang's analysis delves into the intricate relationship between stringent credit standards and the growth of the corporate bond market, finding that a one percentage point increase in tightening lending conditions corresponds to a 7% increase in corporate bond issuance in the Eurozone (Kaya & Wang, 2016). Consequently, when tight regulation creates bottlenecks in bank credit, companies respond by fulfilling their capital requirements by drawing resources from the markets. Altavilla et al. arrive at similar conclusions, using a VAR model to demonstrate how the banking sector's tightening of credit standards is compelling NFCs to turn to trade debt (Altavilla, Paries & Nicoletti, 2019). Crouzet's research confirms this trend, emphasizing how the decline in the supply of bank credit has eroded the prominence of this instrument and led to the emergence of bond issues in the sphere of corporate finance. Nevertheless, he stresses that this preference shift is not radical enough to prevent an aggregate decline in overall debt and investments levels by NFCs (Crouzet, 2018).

The decreasing relevance of bank loans in the balance sheets of NFCs, and the concomitant increase of debt securities, may also stem from the cost dynamics characterizing these two financial instruments. Yields on debt securities have remained at low levels in recent years, reflective of the monetary policies of the ECB. Specifically, the *Corporate Sector Purchase Program* (CSPP) has kept interest rates on debt securities at bay, reducing private sector yields. Additionally, the *Public Sector Purchase Programs* (PSPP) have compressed spreads on government bonds. Crouzet a et al. provide extensive empirical evidence of the existence of these trends, demonstrating that an asset purchase by the ECB equal to 10% of Eurozone Gross Domestic Product (GDP) generates a significant 65 percentage point contraction in bond yields, a phenomenon known as the "stock effect" (Altavilla, Carboni & Motto, 2021). Although the cost of bank loans has also decreased, this occurred to a lesser extent than it did for debt securities, indicating a

lower responsiveness to ECB policies. A possible explanation is that banks have opted not to charge negative interest rates on customer deposits, resulting in a margin disadvantage that has been partially offset by higher interest rates applied to credit business (Cappiello, Holm-Hadulla, Maddaloni, Arts, Meme, Migiakis & McCarthy, 2021).

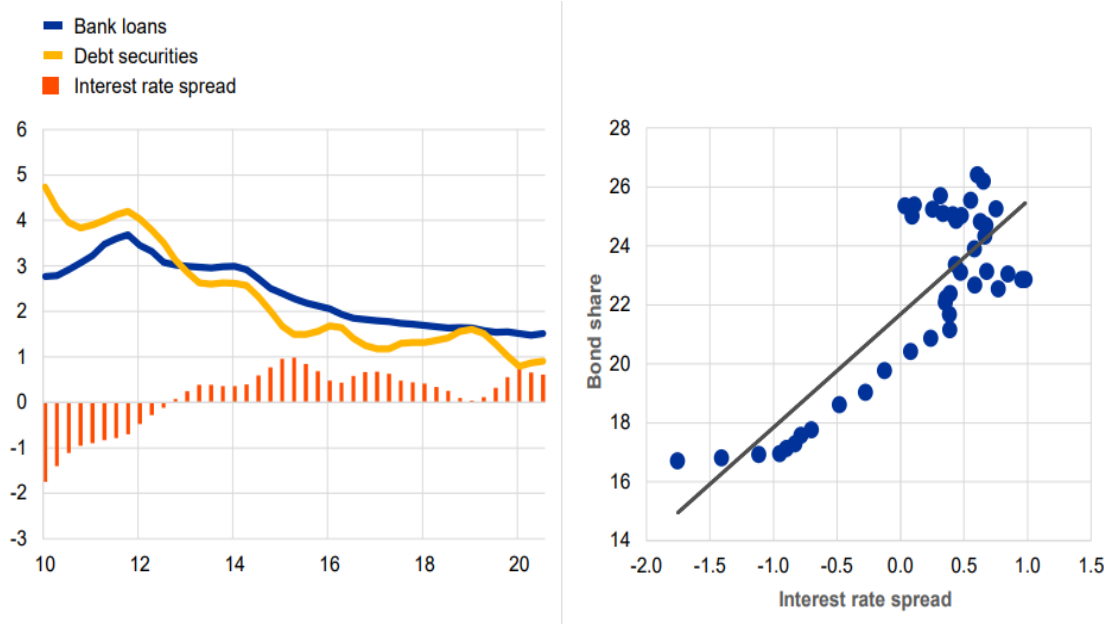


Figure 11 Relative financing cost and importance in the financing structure of debt securities. Interest rates on bank loans and debt securities on the left side. Correlation between interest rate spread and relative importance of debt securities on the right side. (Cappiello at al., 2021).

The spread of the COVID-19 pandemic represents another milestone in the evolution of financing strategies in Europe. This crisis has precisely the features of a real exogenous shock as opposed to the subprime crisis, which flared up in the banking sector and then affected the economy by reflex. Due to the restrictions and the repeated lockdowns, the companies suspended their normal operating activities, causing the resulting cash flows to collapse and the liquidity buffers to become thinner. A direct and clear consequence has been the increase in the need for external sources of financing. Unlike what happened in the aftermath of the banking crisis, the increase in the volume of bank loans functioned as a shock absorber for the COVID-related crisis. After an initial phase of turmoil, debt securities issues have also started to rise again, complementing loans and plugging companies' liquidity needs (Cappiello et al., 2021). A decisive factor in defining the balance between the use of loans and the issuance of bonds following structural crises is not only the type and origin of the crisis but also the response method in terms of monetary

policies and the measures introduced by institutions and governments. In fact, during the subprime crisis, the actions introduced by the institutions were aimed at regulating the banking sector more strictly and came in the form of interest rate cuts, a shift to fixed-rate full allotment tenders, an extended collateral framework and longer-term refinancing operations for banks. These regulatory measures have caused a rapid collapse of the loan market.

Following the COVID-19 crisis, on the other hand, the various European governments and central banks have extended a helping hand to struggling businesses by implementing programs that provide guarantees for bank loans, grants, and initiatives to revive the corporate bond market. Therefore, some action was taken on both fronts: bond purchase programs were introduced to support the trade debt sector alongside bank support programs. The first one, known as the PEPP (Pandemic Emergency Purchase Program), has substantially boosted the recovery of this type of financial market. The second was mainly centered on easing the interest rate on long-term refinancing operations (TLTRO III), and collateral standards (Cappiello et al., 2021). Hence, it can be inferred from these instances that the financing choices of companies are influenced not only by the type of crisis but also by the measures implemented by institutions to combat them, which can alternatively promote one financial instrument over another. Nonetheless, these transformations in corporate finance have not occurred homogeneously, as marked heterogeneities continue to persist across various dimensions, including cross-country disparities, variations across sectors, and differences based on the size and scale of corporations (Cappiello et al., 2021).

In the cross-country context, it can be observed that bank loans' contribution to total financial liabilities declined in 14 of the 19 European countries from 2009 to 2020. The decrease was particularly marked in countries such as Spain, Ireland, and Italy, surpassing the European average. In contrast, Germany witnessed a relatively stable trend, while France witnessed a modest increase of about two percentage points in the share of bank loans. On the other hand, debt securities' weight increased across almost all countries, albeit with considerable variations depending on the case. France and Germany were the front runners driving this trend, followed by Luxembourg, Italy, Slovakia, and Spain (Cappiello et al., 2021). However, a different picture emerges when focusing on the national NFC balance sheets. The heterogeneity across countries somewhat flattens out.

Bank loans still represent the main source of debt and account for around 10% of financial liabilities in almost all situations. In contrast, debt securities are utilized only in countries with more advanced financial centers such as Luxembourg and France, where they weigh about 5%. If equity capital is included in the analysis, listed and unlisted shares in the passive balance sheet cover approximately 40%-60% of the financial liabilities.

Figure 12 Change in capital structure between Q4 2009 and Q3 2020 on the left side. Capital structure as of Q3 2020 on the right side. (Cappiello at al., 2021).

The expansion of the debt securities market in Europe is mainly attributable to issues by large companies. In this sense, small and medium enterprises (SMEs) have not made a substantial contribution. Indeed, several obstacles have acted as a deterrent to the issuance of bonds by smaller companies. Among those are the lower-level information transparency and accounts of the SMEs, the high fixed costs to be incurred for a first entry into the bond market, and the insufficiency or inadequacy of the financial intermediaries responsible for placing the bonds on the market or subscribing corporate. Some countries, such as Italy, are an exception, where attractive tax incentives linked to minibonds have prompted many SMEs to take the plunge by entering the bond market for the first time (Ongena, Pinoli, Rossi & Scopelliti, 2020). Among other things, the study by Ongena et al. brings out interesting implications for these categories of companies. Companies that issue minibonds can negotiate more modest interest rates when they turn to banks

compared to those companies that do not diversify their financing portfolio. This effect is mainly attributable to the changes in the debt seniority structure. Since banks are senior on bonds, introducing a new tranche of bonds into a company's financial structure significantly mitigates the risk associated with bank lending.

In general, the literature has shown that access to market debt is still a difficult path to undertake for those smaller companies. According to data obtained in 2018, more than 63% of non-financial and unlisted companies could not resort to the debt market, although interested (ERICA - European Records of IFRS Consolidated Accounts – database). According to the findings of several linear regression analyses, a company's financial structure appears to directly mirror the specific characteristics of the company itself, including its sector and size. However, it is the latter variable that appears to exert the most significant impact. Research has shown that larger firms tend to rely more heavily on bond financing, with this instrument playing a pivotal role in the liabilities side of their balance sheets. This observation may be attributed to economies of scale, which can significantly reduce issuance costs for corporate bonds as the volume of debt raised in a single transaction increases (Cappiello et al., 2021).

The country of origin of a company also exerts influence on its possibility of financing itself through a specific palette of instruments: in this case, an element that is fundamental is the legal and fiscal architecture defined at the government level in which companies act. The last major push for firms to enter the debt market is given, as already mentioned, by the decline in the cost of bonds relative to that of bank loans, which has been partly caused by monetary policies such as the CSPPs. What is important to underline is that the CSPPs have contributed by curtailing the costs of bond finance and abetting the entry barriers that constituted the deterrent for access to the SME bond markets. Data in hand, since 2016, the launch date of the program for the purchase of corporate bonds by the ECB, there has been a significant increase in the percentage of SMEs with access to market-based finance. By scrutinizing the data provided by the ERICA database, it emerges that 10% of companies with outstanding fixed-income securities had placed their first bonds on the market after 2016. These groups were also smaller than those that had characterized the scene in the past since their average assets were about nine times smaller than those of the players who had previously dominated the debt securities market (Cappiello et al., 2021).

From a survey by SAFE (Survey on the Access to Finance of Enterprises on companies'), it clearly emerges that only a tiny slice of SMEs resort to so-called marked-based finance. Between 2010 and 2020, only 4% of the companies in this cluster had a bond position on the passive side of their balance sheet. On the other hand, 25% of SMEs use massive bank loans, 20% employ internal funds to finance projects, and 20% resort to trade credit (Cappiello et al., 2021). SMEs that achieve greater diversification in funding sources possess several strategic and structural advantages. Several surveys have documented that companies using market finance perform better than the benchmark. By considering the data of the companies that resort to the markets to finance themselves, 26% of these belong to the category of innovative companies, 27% are exporters, and 23% show forecasts with high expected growth. Furthermore, the nature of a firm's sources of capital procurement influences its investing choices. Evidence shows that firms that diversify more strongly can invest more capital without constraints and are less vulnerable to external shocks. Tengulov's research is channeled in this vein. In a 2020 study, the researcher shows how fund diversification helps companies respond appropriately to exogenous shocks. The USA represents the context of his research in the aftermath of the GFC (2007-2009). As a first result, it should be noted that companies that had differentiated their capital procurement before the crisis had *ex-post* higher capital expenditures than other clusters. They also boasted better market valuations, lower cost of debt, greater leverage, and less need to draw on liquid assets to meet cash needs in times of trouble (Tengulov, 2019). De Fiore and Uhlig bring the same narrative into the European context by focusing on NFCs. This study aims to demonstrate the causality between the GFC and the shift from bank finance to bond finance, especially when the costs of debt securities have fallen below the average levels of those proposed by banks. The scholars then later show that the flexibility of the banks, the openness towards refinancing contracts, and the ability of companies to replace the various debt instruments represent pillars for the resilience of an economic system subject to severe stress (De Fiore & Uhlig, 2015).

2.3 Multiple Avenue of Intermediation

A large portion of fringe literature has been investigating the subtle game of balances in corporate financing choices and analyzing the pace at which some instruments are conquering the market and establishing themselves on the NFCs' balance sheets as a

source of capital. This literature has been particularly prolific in Europe and has grown enormously in recent years in conjunction with the evolution of the European market towards a single financial market. Four strands and pillars of this literature can be traced:

- **The emergence of new financing trends and sources of financing**. Scholars have highlighted the increasing importance of non-bank funding sources such as crowdfunding platforms, peer-to-peer lending platforms, and other forms of alternative finance. These alternative channels make it possible to fill the gaps in the traditional banking markets and facilitate entry into the world of finance for medium-small sized companies (Busch & Van Rijn, 2018), (Véron, 2013), (Ziegler, Shneor, Wenzlaff, Odorović, Johanson, Hao & Ryll, 2019), (Patalano & Roulet, 2020), (Siemionek-Ruskań & Fanea-Ivanovici, 2021).
- A prevalent portion of this literature set out to understand how some radical **changes in legislation and regulations** have undermined the traditional role of banks on the capital procurement markets, paving the way for the advent of financial intermediaries and alternative financing instruments.

  Among these new regulations, those most often at the center of attention are the Basel III framework on banks' lending practices, the impact of MiFID II regulations on the provision of investment services, and the implications of the Payment Services Directive 2 (PSD2) on the payments industry (Roulet, 2018), (Boskovic, Cerruti & Noel, 2010), (Ferrarini, 2017), (Cullen, J. 2022), (Naceur, Marton & Roulet. 2018).
- The third research file hinges on understanding **digitization**'s disruptive role. In the brokerage sector, technologies are opening up new scenarios. Particularly attractive among these are the debt, investments, and payments platforms. Some studies deal with framing these platforms' potential risks and benefits (Pakhnenko, Rubanov, Hacar, Yatsenko & Vida, 2021), (Horobet, Mnohoghitnei, Zlatea,& Belascu, 2022), (Burlacu, Ciobanu, Troaca, & Gombos, 2021), (Marszk & Lechman, 2021).
- Another much discussed trend explored the **substitution effect of bank loans through corporate bonds** in the financial landscape. Overall, the substitution of bank loans with bonds in Europe is a complex and multifaceted trend that reflects broader shifts in the financial scene. Berton, Mocetti, and Presbitero question

whether the two financial instruments should be classified as complementary or substitutes. They use a cluster of Italian companies for this scope and find proof of a substitution effect, especially for large and creditworthy companies (Berton, Mocetti, Presbitero & Richiardi, 2018).

Many texts follow the same assumption and find evidence of a substitution effect of the two instruments (Astrauskaite, & Paškevicius, 2014), (Becker & Ivashina, 2018). A fundamental part of this literature highlighted the play of subtle equilibriums, which lead companies to privilege the trade debt over the most traditional bank debt. Already in unsupported years, before the GFC of 2008, Kashyap, Stein, and Willcox underlined how in times of restrictive monetary policies, there was a contraction of bank loans in favor of commercial paper issuance, with a change in the mix of external financing sources' agency (Kashyap, Stein & Wilcox, 1993). According to scholars, this rearrangement of the investment mix can influence investment strategies, determining their output and interests. Holmstrom and Tirole show by applying the observations to the American context that when capital constrictions occur (credit crunch, savings squeeze, or collateral capitalized ones), the debt market finance leaps (Holmstrom & Tirole, 1997). Davis and Ioannidis investigate the relationship between the two instruments from the point of view of taxonomy and interchangeability and question whether the two instruments can be considered substitutes or complementary. From the surveys carried out, the two products are presented as complementary by analyzing their average behavior over an extended stable period and their turnover during periods of crisis and high volatility (Davis & Ioannidis, 2003). The two scholars refute the dualistic view of a mere replacement or a *multiple avenue* by pointing out that in times of decline in the prominence of bank loans, perhaps triggered by adverse events, the issue of new securities does not entirely fill the gaps left open by the former. Moreover, contracting a bank loan by companies is often a prerequisite for entering the debt securities market at a later time. Indeed, the bank's monitoring activity provides a support basis for the rating agencies to evaluate the corporate risk profile, which is incorporated in the bond price. From the examples provided by the two scholars, it can be inferred that the two financial instruments should be used in conjunction by companies,

complementing each other. A large part of the literature has also investigated the reasons that provoke a substantial cyclicality of the business linked to bank loans. This part of the literature diverges in two: some like to examine the credit demand side, like Bernanke and Gerter, and others, like Brunnermeier, assume that the supply factors are more relevant to explain the periodic and recurring collapses in the volume of bank loans (Bernanke & Gertler, 1995), (Brunnermeier, 2009).

2.4 State of the research

This research work mainly aims to be pigeonholed in that line of literature that has dealt with the substitution of bank loans through bonds in the European panorama. In general, a substitution effect was documented both in the post-crisis of 2008, thanks to the role played by the more stringent regulations applied to the banking sector, and in the time frame when the reference rates settled at levels around zero or in the negative range. In the first instance, in tandem with the Global Financial Crisis (GFC), the implementation of more stringent regulations targeting the banking sector has resulted in a constricting of lending criteria. Consequently, this has prompted numerous companies to explore alternative avenues, such as the bond market, to procure capital. During the second period from 2014 to 2021, interest rates reached levels in close proximity to zero, and in some cases even dipped into negative territory. Undoubtedly, this development played a significant role in further incentivizing companies to turn to bonds as a financing option. The exceptionally low or negative interest rates created an environment where borrowing costs were significantly reduced, making bonds an attractive avenue for companies seeking capital. During those years, the EU has additionally put in place *ad hoc* efforts to sustain the growth of the corporate bond market (CSPP). However, there is still a relatively unexplored field regarding the substitution phenomenon in a context characterized by rampant inflation and high-interest rates. This scenario is an entirely new chapter in European economic history, especially in the European market, which has evolved and consolidated since the introduction of the single currency. To this day, an exhaustive treatment of the subject matter in scholarly literature remains conspicuously absent. Astonishingly, despite the extensive body of academic research, no comprehensive analysis or comprehensive study has been undertaken to fully explore and elucidate the intricacies of this topic. Consequently, to undertake the aforementioned analysis, it becomes imperative to draw upon existing models that have been previously

developed and utilized to discern the substitution effect between the two instruments. Building upon this foundation, an additional independent variable pertaining to inflation will be incorporated. This methodological approach aims to shed further light on the presence or absence of a substitution effect between loans and corporate bonds during periods of rising general price levels. By integrating the influence of inflation, a more comprehensive understanding can be achieved, thereby deepening our insights into the dynamics of these financial instruments and their interplay within the broader economic landscape.

3 AIM OF THE RESEARCH AND RESEARCH QUESTION

The research aims to shed light on new trends in corporate financing strategies. Specifically, this study will try to disentangle how the current extreme market conditions, on the one hand, inflation at record levels, on the other, the rapid rise in interest rates by the ECB, are redefining the liabilities side of NFCs' balance sheets and their strategies to pursue a weighted and optimal capital structure.

Research questions:

- *Does inflation cause a change in the level of corporate bonds and bank loans issued by NFCs?*
- *Is there a substitution effect of bank loans through corporate bonds in time of inflation?*
- *Is the substitution effect, if any, found at the level of each individual country?*

A step-by-step analysis will be conducted, considering the specific structural differences in the capital markets of the three countries under analysis: Italy, France, and Germany. It is desired to observe whether each country analyzed displays a marked substitution effect.

To address this initial inquiry, a T-test will be conducted to compare the averages of emission levels between pre- and inflationary periods and to reveal potential anomalies in the emissions the two financial instruments. Although the T-test is a straightforward statistical test, it can yield insightful results if properly applied, offering valuable preliminary insights to guide the development of appropriate models and inform further investigation. In this context, the T-test was also applied to variables derived from the

Bank lending Survey (BLS) conducted by the ECB, providing essential information on the objectives and reasons behind formal bank loan requests made by companies. Through a systematic analysis of these variables, a distinctive pattern that emerged during the inflationary period can be identified, which led to a significant increase in demand for bank loans by companies. The hypotheses for the t-test are structured as follows:

$$H0: Loan\ net\ issue\ \mu_{pre-inflation} = Loan\ net\ issue\ \mu_{during\ inflation}$$

$$H0: Bond\ net\ issue\ \mu_{pre-inflation} = Bond\ net\ issue\ \mu_{during\ inflation}$$

$$H0: Loan\ demand\ due\ to\ financing\ of\ fixed\ investment\ \mu_{pre-inflation} = Loan\ demand\ due\ to\ financing\ of\ fixed\ investment\ \mu_{during\ inflation}$$

$$H0: Loan\ demand\ due\ to\ financing\ of\ inventories\ and\ working\ capital\ \mu_{pre-inflation} = Loan\ demand\ due\ to\ financing\ of\ inventories\ and\ working\ capitalt\ \mu_{during\ inflation}$$

$$H0: Loan\ demand\ due\ to\ financing\ of M\&A\ and\ corporate\ restructuring\ \mu_{pre-inflation} = Loan\ demand\ due\ to\ financing\ of M\&A\ and\ corporate\ restructuring\ \mu_{during\ inflation}$$

$$H0: Loan\ demand\ due\ to\ financing\ of\ debt\ restructuring\ and\ renegotiation\ \mu_{pre-inflation} = Loan\ demand\ due\ to\ financing\ of\ debt\ restructuring\ and\ renegotiation\ \mu_{during\ inflation}$$

To follow, a Granger Causality Test will be performed, to observe in particular what kind of interdependence exists between the three primary sources of external financing that companies use. The Granger Causality Test is a statistical test to determine whether changes in one-time series can be exploited to predict changes in the other time series. It is important to note that the Granger Causality Test does not prove a cause-effect relationship between its variables. Instead, it provides a measure of the strength of the relationship between the two variables considered, mainly assessing if a variable can be used to predict fluctuations in the other (Granger, 1969) (Sims, 1972). Previously in the literature, the test was conducted on historical series extended from 2003 to 2013 and at an aggregate level for Europe. It revealed a strong interconnection between loan and bond (note the direction of the relationship) and no evident persistent causal relationship between equity and bond issue (Kaya & Wang, 2016). In the case of this research work,

the test will rather be conducted on historical series extended from 2003 to 2022 and on the single country under analysis. The research hypotheses are the following:

Hypothesis 0 (H0): One financial instrument does not Granger-cause the other.

Hypothesis 1 (H1): One financial instrument does Granger-cause the other.

Formalizing the null hypothesis, we are looking for Granger causality relationships between the following combinations of financial instruments:

$$Bond \rightarrow Equity$$

$$Equity \rightarrow Bond$$

$$Equity \rightarrow Loan$$

$$Loan \rightarrow Equity$$

$$Bond \rightarrow Loan$$

$$Loan \rightarrow Bond$$

At the core of the Granger causality test lies the Wald test. This is based on the comparison between two models: the unrestricted model and the restricted model. Depending on which of these two models is statistically more plausible, it is determined whether one series Granger causes the other or not.

Unrestricted model: ARDL (Autoregressive Distributed Lag).

$$Bond = \alpha + Equity_t + \sum_{i=1}^{3} Bond_{t-i} + \varepsilon_t$$

Restricted model: AR(p)

$$Bond = \alpha + \sum_{i=1}^{3} Bond_{t-i} + \varepsilon_t$$

Where i is a number between one and three as the test is run from one to three lags. It is expected that in the face of a mature and profiled bond market, there will be a strong interdependence of the former with the bank lending market. By the contrary, an interdependence between Equity and Loan is envisioned for underdeveloped and immature markets.

Once the starting context has been explored, three linear regressions will be performed with the Ordinary Least Squares (OLS) method. For each country, an equation will be structured in the form:

$$(1)\ Log_{Loan} = \alpha + \beta_1 * Log_{Bond} + \beta_2 * Log_{Equity} + \beta_3 * Loan\ demand + \beta_4 * HICP + \beta_5 * Price_{differential} + \beta_6 * VSTOXX_{50} + \beta_7 * EURIBOR + \beta_8 * GBBY + \varepsilon$$

$$(2) Log_{Bond} = \alpha + \beta_1 * Log_{Loan} + \beta_2 * Log_{Equity} + \beta_3 * Loan\ demand + \beta_4 * HICP + \beta_5 * Price_{differential} + \beta_6 * VSTOXX_{50} + \beta_7 * EURIBOR + \beta_8 * GBBY + \varepsilon$$

It is intended to study specifically the impact of inflation on the gross issue of bank loans and corporate bonds in each country using these models. In order to make the model more realistic and dynamic, the effect of other revealing variables, such as market volatility, the price level of bank loans applied to NFCs, the level of the benchmark interest rate and the loan demand perceived by bank managers is captured. The last variable taken into consideration derives from the BLS. The ECB conducts a regular survey called the BLS to gather information about banks' lending behavior in the Eurozone. The survey is conducted for each quarter and aims to provide unique insights into trends and changes in credit standards, loan demand, and lending conditions. In the BLS for the fourth quarter of 2022, 151 banks were surveyed, with a response rate of 99 (European Central Bank, January 2023). These key figures imply that this survey covers over half of the Eurozone bank lending to households and non-financial corporations (Kaya & Wang, 2016). This variable is particularly interesting for the research work because it tracks the flow of gross demand for bank loans. In fact, the loan demand variable derived from the BLS can serve as a good proxy for measuring the pure demand for loans, keeping track of all requests that come to the banks regardless of those that are ultimately accepted or rejected after the bank's scrutiny. On the other hand, a variable such as the gross issue of new bank debts by businesses only detects the portion of loans granted to businesses and, therefore, cannot be said to accurately explain the pure demand for credit by businesses.

Finally In order to estimate the effects of the independent variables (Loan Demand, HIDP, Price Differential, VSTOXX 50, Euribor) at different lags on the Log Loan and Log Bond variables, concurrently in the three different countries, a fixed effects panel model was

employed. The fixed effects model isolates the error component attributed to the i-th subject (in this case, one of the three countries), yielding the primary effect of each variable on the dependent variable. The dataset comprises a balanced Panel Data, with 229 observations for each of the three countries, resulting in a total of 687 observations. The estimated models are as follows:

$$(1) Log_{Loan_{it}} = \alpha + \beta 1 * Log\ Bond_{it-3} + \beta 2 * Log\ Equity_{it-3} + \beta 3 * Loan\ demand_{it-3} + \beta 4 * HICP_{it-3} + \beta 5 * Price\ differential_{it-3} + \beta 6 * VSTOXX\ 50_{it-3} + \beta 7 * EURIBOR_{it-3} + \varepsilon$$

$$(2) Log_{Bond_{it}} = \alpha + \beta 1 * Log\ Loan_{it-3} + \beta 2 * Log\ Equity_{it-3} + \beta 3 * Loan\ demand_{it-3} + \beta 4 * HICP_{it-3} + \beta 5 * Price\ differential_{it-3} + \beta 6 * VSTOXX\ 50_{it-3} + \beta 7 * EURIBOR_{it-3} + \varepsilon$$

In order to assess the effects of the independent variables (Log Loan, Log Bond, Log Equity, Loan Demand, HIDP, Price Differential, VSTOXX 50, Euribor) at various time lags on the Log Loan and Log Bond variables, while considering the specific error (∝_i) associated with each individual subject (referred to as fixed effects in the model) and the model error (ε_it), we have employed a fixed effects model. The coefficients are estimated using Pooled OLS Regression, with each coefficient taking into account the individual effects of each subject by removing them from the model and utilizing the information derived from observed temporal variations for each country. The adoption of a random effects model would result in estimating an excessively large number of coefficients for the subjects identified in the Panel Data (Germany, France, Italy).

4 Statistical Analyses

In the forthcoming chapter, the statistical tests, as delineated in Chapter 3, will be executed to derive quantitative insights regarding the research inquiries posed. Specifically, the analysis aims to ascertain whether there exists a discernible shift in the magnitude of NFC debt instrument issuance during periods of inflation. It also aims to determine the presence of a substitution effect between bank loans and corporate bonds, and to explore the traceability of this substitution effect within the context of each

individual country. The subsequent empirical examination seeks to provide comprehensive and illuminating answers to these pivotal research questions.

4.1 EXPLORATORY DATA ANALYSIS. T TEST

Commencing with the statistical analysis, the T-test for independent samples is executed. It has been chosen to perform a Student's T-test with independent samples as the distribution of the examined variables characterized as normal. Furthermore, a Student's T-test with different variances was chosen as suggested by the output of Levene's test. The T-test is a statistical examination utilized to assess the significance of the difference between the means of two samples. It enables us to determine whether the observed dissimilarities between two data sets are randomly occurring or significantly different. The formula for the T-test for independent samples is as follows:

$$t = \frac{\left((\bar{x}_1 - \bar{x}_1) - (\mu_1 - \mu_2)\right)}{\sqrt{\frac{{S_1}^2}{n_1} + \frac{{S_2}^2}{n_2}}}$$

where:

- $\bar{x}_1$, $\bar{x}_2$: are the sample means of the first and second sample.
- ${S_1}^2, {S_2}^2$: are the sample variance of the first and second sample.
- n_1 , n_2 : are the number of observations of first and second sample.
- $\mu_1 - \mu_2$: is the assumed mean difference (zero).

H0: there is no significant difference between the means of the two data sets.

H1: there is significant difference between the means of the two data sets.

The time series data is partitioned into two distinct panels for the analysis. The first panel encompasses the time period from 2003 to 2020, while the second panel spans from 2020 to 2022 for the variables bond and loan. In contrast, all other variables are divided into two clusters, one spanning from 2003 to 2020 and the other from 2020 to 2023. The pre-inflation values are measured using the first panel, while the values below the impact of inflation are measured using the second panel. The primary objective of this analysis is to detect any anomalous mean values of the variables following the observed rise in inflation rates.

The first series considered are the monthly net issuance values of bonds and loans which are obtained as the change in the level of the monthly outstanding amounts. What we want to observe is whether, as common-sense postulates, there has been a collapse in the turnover of the two instruments following the increase in inflation and interest rates. In fact, it has often been demonstrated that in periods of inflation firms rationalize investments which, together with the increase in the cost of money, could induce firms to slow down the contraction of debt and to readjust their financial position to save capital costs (Macklem, 1995), (Adams, 1983), (Bond & Van Reenen, 1995). To corroborate the results obtained regarding the loan variable, further variables derived from Questions 6 and 7 of the BLS are inserted.

The ECB's 'Annex 1 Results for the standard questions' provides all questions formulated to bank managers within the framework of the BLS.

Question 6 is structured as follows:

"Over the past three months (apart from normal seasonal fluctuations), how has the demand for loans or credit to enterprises changed at your bank? Please refer to the financing need of enterprises independent of whether this need will result in a loan or not".

As mentioned elsewhere, this variable is a good proxy for calculating the pure demand for bank loans regardless of the share of companies to which credit is granted as a last resort. In fact, as the question arises, managers must evaluate the increase and decrease in demand regardless of whether the request from companies will get a positive response from the bank or not.

Question 7 is structured as follows:

"Over the past three months, how have the following factors affected the overall demand for loans or credit lines to enterprises?"

This inquiry is connected to the preceding one, but it delves deeper and explores in greater detail the specific factors that have contributed to the rise or decline in loan demand. In the context of this study, it is particularly crucial to examine the motives or objectives for which firms seek bank loans, as it may shed light on the capital requirements that firms

incur during periods of high inflation. The questionnaire includes several categories that drive the demand for bank loans, including:

- **Fixed investment:**

  Fixed investment spending refers to business spending on long-lived assets such as machinery, equipment, real estate, and infrastructure that are intended to be used to produce long-term goods and services. These assets are considered fixed assets because they are owned by the business for an extended period and are used to generate future cash flows.

- **Inventories and working capital:**

  Inventories and working capital represent the amount of cash and resources a business must keep available to support its daily operations. Inventories consist of the finished and unfinished goods that a business holds for future sale, while working capital comprises the cash and other liquid assets that a business holds to support its day-to-day operations.

  The working capital is commonly computed as the difference between current asset (cash, accounts receivable, inventory, and other assets that are expected to be converted to cash within one year) and current liabilities (accounts payable, taxes owed, and other debts that are due within one year).

- **Mergers/acquisitions and corporate restructuring:**

  Merger/acquisition and corporate restructuring refers to activities that firms undertake to change their organizational structure and/or to acquire other firms to expand or improve their market position. These activities may include the merger of two or more firms to create a new entity, the acquisition of one company by another, or the internal restructuring of a firm to improve its efficiency and productivity.

- **General level of interest rates:**

  The general level of interest rates refers to the prevailing interest rate in the financial market, which is determined by the market forces of supply and demand. The level of interest rates has an impact on the cost of money and on the investment decisions of businesses and consumers.

- **Debt refinancing/restructuring and renegotiation:**

> Debt refinancing/restructuring and renegotiation refers to the activities that firms undertake to adjust the terms of their existing debt, to reduce their financing costs and improve their overall financial position. These activities may include renegotiating loan terms, changing interest rates, converting debt into equity or other forms of alternative financing.

In this study, the general level of interest rates is not examined for two significant reasons. Firstly, the data collection for this variable only commences from 2015, which does not correspond precisely with the data collection period for the other variables. Secondly, more precise variables such as the real value of interest rates, which are not prone to judgment bias, are available. However, all the other variables considered in this study are collected on a quarterly basis, spanning from the first quarter of 2003 to the first quarter of 2023, and transformed into monthly for research purposes.

The data collected for Question 6 and Question 7 of the BLS is divided into five categories based on the degree of perceived increase or decrease by the bank's senior officers: (1) decreased considerably; (2) decreased somewhat; (3) basically unchanged; (4) increased somewhat; (5) increased considerably.

The data is then aggregated using various methods. For this study, the "diffusion index" was chosen, which represents the weighted difference between those who report an increase in demand and those who report a decrease in demand.

The diffusion index is constructed as follows: a score of one is assigned to bank officers who have chosen the extreme categories and answered "considerably", while those who have chosen intermediate categories and expressed a less extreme opinion are assigned a score of 0.5. After assigning the relative weights, the difference between the share of banks reporting an increase in demand and those reporting a decrease in demand is calculated.

Loan

Country	*Mean Diff.*	*Mean Before*	*Mean After*	*statistic*	*p-value*	*sign.*	*df*	*Conf. Low*	*Conf. High*
France	-1’721.44	3’263.06	4’984.50	-0.97	0.34		17.08	-5’453.69	2’010.81
Germany	-5’055.27	1’458.10	6’513.38	-2.87	0.01	***	16.50	-8’782.24	-1’328.31
Italy	946.76	597.51	-349.25	1.01	0.32		31.02	-969.19	2’862.71

Bond

Country	*Mean Diff.*	*Mean Before*	*Mean After*	*statistic*	*p-value*	*sign.*	*df*	*Conf. Low*	*Conf. High*
France	730.73	1'908.54	1'177.81	0.77	0.45		25.69	-1'214.97	2'676.43
Germany	-1'266.65	658.73	1'925.38	-1.31	0.21		18.00	-3'295.44	762.14
Italy	-762.52	505.06	1'267.58	-1.84	0.08	*	18.09	-1'634.91	109.86

Question on the Impact of Fixed Investment

Country	*Mean Diff.*	*Mean Before*	*Mean After*	*statistic*	*p-value*	*sign.*	*df*	*Conf. Low*	*Conf. High*
France	-11.11	-10.67	0.44	-2.91	0.01	***	13.04	-19.35	-2.88
Germany	2.50	-1.06	-3.56	0.69	0.50		14.72	-5.22	10.22
Italy	-1.38	-4.82	-3.44	-0.39	0.70		17.72	-8.80	6.05

Question on the Impact of Inventories and Working Capital

Country	*Mean Diff.*	*Mean Before*	*Mean After*	*statistic*	*p-value*	*sign.*	*df*	*Conf. Low*	*Conf. High*
France	-8.04	-0.60	7.44	-2.60	0.02	**	11.98	-14.78	-1.31
Germany	-5.47	3.64	9.11	-1.79	0.10	*	10.48	-12.24	1.30
Italy	-5.82	7.29	13.11	-1.23	0.25		10.40	-16.30	4.66

Question on the Impact of Mergers and Acquisitions and Corporate Restructuring

Country	*Mean Diff.*	*Mean Before*	*Mean After*	*statistic*	*p-value*	*sign.*	*df*	*Conf. Low*	*Conf. High*
France	-3.24	2.43	5.67	-0.81	0.43		14.29	-11.74	5.27
Germany	0.76	-0.01	-0.78	0.62	0.54		17.34	-1.84	3.37
Italy	-0.03	-1.69	-1.67	-0.02	0.99		60.46	-3.25	3.19

Question on the Impact of Refinancing/Restructuring/Renegotiation

Country	*Mean Diff.*	*Mean Before*	*Mean After*	*statistic*	*p-value*	*sign.*	*df*	*Conf. Low*	*Conf. High*
France	0.90	5.35	4.44	0.63	0.53		53.00	-1.97	3.79
Germany	3.22	6.22	3.00	2.77	0.01	***	16.93	0.77	5.67
Italy	11.74	15.85	4.11	2.32	0.04	**	9.67	0.41	23.07

Table 5 T-test for the three scrutinized countries. Net issue of Bank Loan and Corporate Bond in Million EUR. Question 7 of BLS in %. Data retrieved from the EBC data warehouse. (Own Illustration).

Upon analyzing the data for France, it becomes apparent that there was a modest decline in the average of bonds and a more significant increase in the average of loans. Nonetheless, in both cases, there was no statistically significant variance between the pre-inflation and post-inflation averages. Hence, it cannot be concluded that there was a collapse in the two markets. On the contrary, although not statistically significant, a revival of the loan market has been observed. It appears that fixed investments and the need to support inventories and working capital were the primary drivers of loan demand during the inflationary period. This is particularly evident in the notable disparity between

the pre-inflation and inflationary period averages of the "inventories and working capital parameter", which rose from an average of -0.6 to an average of 7.44. This indicates that post-pandemic demand remains strong in several sectors, likely prompting companies to broaden their operational activities. Indeed, many firms were unable to sell or produce goods and services to their usual standards during the pandemic due to the suspension of operations and strict lockdowns. However, with the gradual return to normalcy, companies are working at full capacity to meet the rising demand.

Numerous sectors are experiencing a renaissance post-pandemic, driven by a substantial demand for goods and services. The automotive industry for instance has performed exceptionally well, with car sales in the EU rising by 24% in the first half of 2021 compared to the same period the previous year (ACEA, 2022). This trend is also evident in France, where car registrations increased by 20.9% in 2021 compared to the same period in the previous year (Comité des Constructeurs Français d'Automobiles, 2021). Other industries that are undergoing robust expansion post-pandemic in Europe include tourism, which recorded a 200% increase in summer bookings in 2021 compared to the previous year, renewable energy, and technology (European Commission, October 2021). In France, flagship exports and tourism have particularly benefited from this recovery, with textile and clothing exports rising by 50% in the first four months of 2021 compared to the same period in the previous year (Fédération Française de la Couture, du Prêt-à-Porter des Couturiers et des Créateurs de Mode, 2021). Moreover, French food exports increased by 4.4% in the first eight months of 2021 compared to the same period in 2020 (Fédération du Commerce et de la Distribution, October 2021).

Similar to France, Germany did not experience a significant decrease in the monthly net volumes of loans and bonds. On the contrary, the average monthly net emissions of loans during the last two years were statistically higher than in the pre-inflation period, indicating that loan issuance actually accelerated. Loan issues rose significantly from 1,458 million EUR in the pre-inflationary period to 6,513 million EUR in the inflationary period, pointing towards a robust loan market in Germany.

Regarding the BLS, the differences in responses to Question 7 were not significant, except for the question on the impact of debt refinancing/restructuring/renegotiation, which lost importance in driving the loan requirement by companies. Moreover, the test on the

average of inventories and working capital as a driver of loan applications is significant at 10%. Among the various triggers or business needs that lead companies to apply for bank loans, this parameter seems to weigh the most, even in terms of absolute value. This pattern is similar to that found in France and suggests that in the last two years, this factor has become more important in estimating the demand for loans, indicating that companies are seeking to expand their activities and keeping their operating activities at high speed.

The surge in demand for loans and expansion of business activities is evidently reflected in Germany's GDP growth of 3.9% in 2021 as compared to 2020, as per the German Federal Statistical Office in 2022 (German Federal Statistical Office, 2022). The latest data from the German General Office of Statistics reveals that the sectors with the most impressive progress in 2021, in contrast to the previous period, were the manufacturing industry, with a surge in turnover of 13.6%, followed by the wholesale and retail trade, where turnovers grew by 6.5%, and business services, whose turnover increased by 5.5%. Additionally, the information and communications sector and the construction sector also played their part in the GDP development, expanding by 3.3% and 2.4% respectively, as reported by Destatis in 2022 (Destatis, 2022).

Italy stands out as the sole country among those examined where a decline in loan issuances has been observed, although not to a significant extent. The average loan issue amount dropped from 597 million EUR to -349 million EUR, while bond issuances continued to surge at an accelerated pace, marked by a statistically significant increase in the average issue amount from 505 million EUR to 1,267 million EUR. These observations are particularly noteworthy, especially given the marked contraction of the Italian bank debt market compared to other countries analyzed. However, it is important to note that the crisis in the Italian bank loan market predates the recent inflationary surge and can be traced back to the years 2011-2012, as shown in Figure 20, which depicts loan market volumes. The subprime crisis of 2008 played a pivotal role in exacerbating the situation, causing a significant reduction in lending activities and financial resources available to banks, leading to greater caution in the loan approval process for businesses (Ginzburg & Masciandaro, 2013).

As for the trade debt market, a series of strategic fiscal and legislative measures implemented by the Italian government have facilitated the participation of numerous

companies in the bond market, creating the fertile ground for the proliferation of minibonds. These measures aim to satisfy the requirements of the Italian economic fabric, which is mainly driven and defined by unlisted SMEs. Minibonds are a novel financing vehicle consisting of medium-to-long-term debt securities issued by both listed and unlisted companies to a group of highly specialized professional investors. They are generally issued by corporations and cooperatives - other than banks and micro-enterprises - that are not listed on markets open to private investors, with a turnover of over 2 million EUR or at least 10 employees. Companies that issue minibonds are usually in a "good standing" situation, meaning they are not subject to bankruptcy proceedings. The minibonds are typically characterized as bond loans with an amount lower than 50 million EUR. As a result, these instruments enable unlisted companies to finance themselves using instruments typically available only to listed companies on regulated markets, with the opportunity to carry out private placements to institutional investors (it is worth noting that, to date, minibonds are not available to retail investors) (Osservatori Entrepreneurship Finance & Innovation, 2021).

The diffusion of minibonds on the market can be attributed, in large part, to a deliberate intervention by the Italian legislator. In 2012, the Monti Government introduced legislative changes aimed at bringing Italian legislation in line with European standards and providing tax benefits to bond issuers and investors. These changes included the deductibility of issuing expenses, such as rating agency fees and commission for arrangers and advisors, as well as the deductibility of interest expenses under certain conditions. Investors, in turn, were granted an exemption from withholding tax for incomes accrued on securities traded on regulated markets of EU states or those belonging to the so-called whitelist.

These provisions were subsequently reinforced by further legislative measures, including the Destination Italy Decree 2013, the Competitiveness Decree 2014, and the 2019 Budget Law (Osservatori Entrepreneurship Finance & Innovation, 2021). The result of these interventions has been an exponential growth of the minibond market in Italy, which has played a key role in the wider expansion of the bond market.

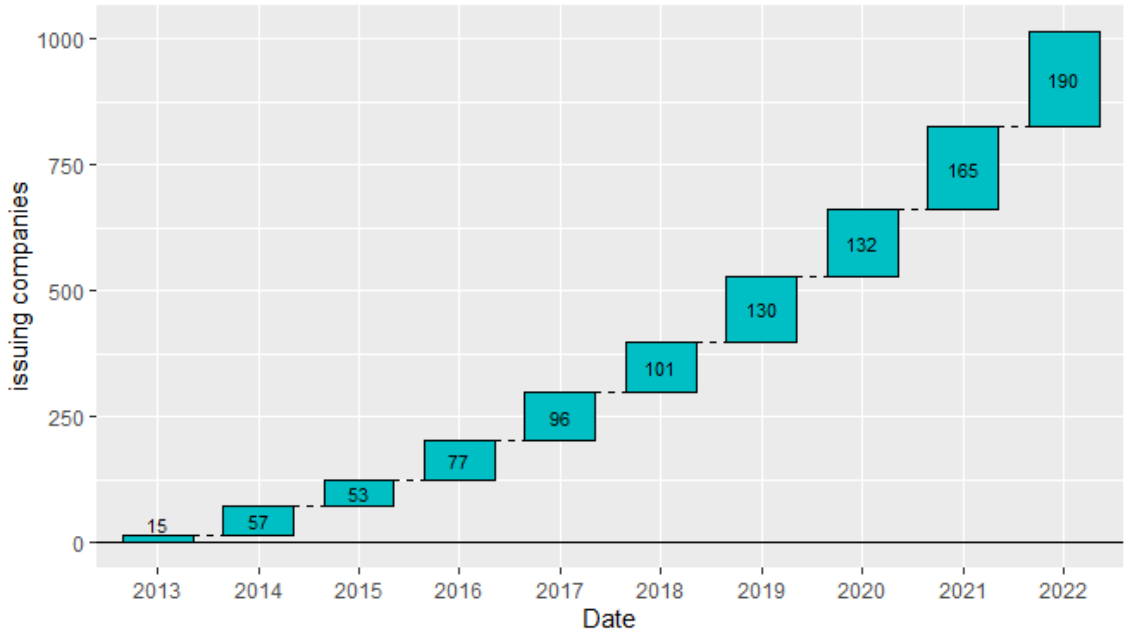


Figure 13 The flow of news issuers that are facing the Italian market of minibonds, year by year. Source: Osservatori Entrepreneurship Finance & Innovation. (2022). 9° Report italiano sui minibond Politecnico. (Own illustration).

Similar to Germany, the demand for loans for company restructuring in Italy has significantly decreased, but there is no significant change for any of the other variables considered.

Summarizing the T-test results, it is apparent that market volumes of the two financial instruments did not experience any significant downturn during the inflationary period. On the contrary, loan issuances in Germany and France accelerated, while bond issuances surged in Italy. Notably, the parameters of Question 7 of the BLS survey suggested that the upsurge in loan and bond issuances was primarily driven by companies' requirements to finance their inventories and working capital or, as in the French case, even to support fixed investments. In contrast, corporate restructuring and refinancing have become less impactful in meeting companies' financing needs.

These intriguing trends reflect the latest developments in the European and global economic landscape. Indeed, as a result of the pandemic crisis, numerous businesses had to resort to external capital to survive and meet their liquidity needs. This was further compounded by the suspension of regular operational activities due to the repeated and stringent lockdowns. In light of this, we observe from Figures 14, 15, and 16 how significant emissions peaks related to the two debt instruments were recorded during the

first quarter of 2020. In France, both loans and bonds served as shock absorbers and supported companies in managing the crisis. In Germany and Italy, loans were the primary safe haven instrument. This was largely due to political choices and regulations that envisaged state intervention in the form of loan guarantees or non-repayable grants, particularly in Italy.

Following the first phase marked by the COVID-19 crisis and the gradual easing of restrictions, companies have resumed their normal operations. However, this was not without challenges, as evidenced by the first inflationary peaks observed in the second quarter of 2021. As highlighted in the introductory chapters, one of the key drivers of current inflation is the surge in prices of raw materials and the robust post-pandemic demand that has resulted in supply chain bottlenecks across numerous sectors.

Similar to the perennial conundrum of whether the chicken or the egg came first, discerning the predominant driver of current inflation remains a complex undertaking. Specifically, it remains unclear whether the inflationary pressures are primarily attributable to the soaring prices of raw materials, such as energy products, or rather a reflection of the post-pandemic demand surge in select sectors, which was previously suppressed by economic uncertainty and prolonged lockdown measures throughout 2020. An intersection of the two aforementioned factors is a plausible explanation for the current state of affairs. Specifically, the post-pandemic surge in consumer demand may have incentivized businesses to increase their operations, thereby drawing on debt financing. Such financing may have played a key role in enabling these businesses to satisfy burgeoning consumer demand, albeit at the potential expense of contributing to inflationary pressures in the economy. Companies have hence inflated their turnover and increased their operating activities in recent years due to this post-COVID demand. This hypothesis is supported by the fact that the European GDP recorded a sharp increase from Q2 of 2021 after the collapse in 2020 coincided with the pandemic. The aforementioned trends are evident in Figures 14, 15, and 16. Following the peaks recorded in 2020 amidst the COVID-19 pandemic, loan and bond issuances normalized, albeit on high levels between 2021 and 2022. During this epoch, loan issuances held dominance in France and Germany, with bond issuances prevailing in Italy. The emission of debt instruments moved concomitantly with the explosive growth of the European GDP in 2021, which despite regularizing in 2022, persisted at elevated levels. Through meticulous interlacing

of the complex plot connecting the graphs, one can unearth compelling evidence that augmented post-pandemic demand has impelled companies to finance their operations by leveraging debt capital for the purposes of expansion and consolidation.

Figure 14 Net issue of bonds and loans in France. Values in Million EUR. (Net issue calculated as the difference in the monthly outstanding amounts). Data retrieved from the ECB data warehouse. (Own illustration).

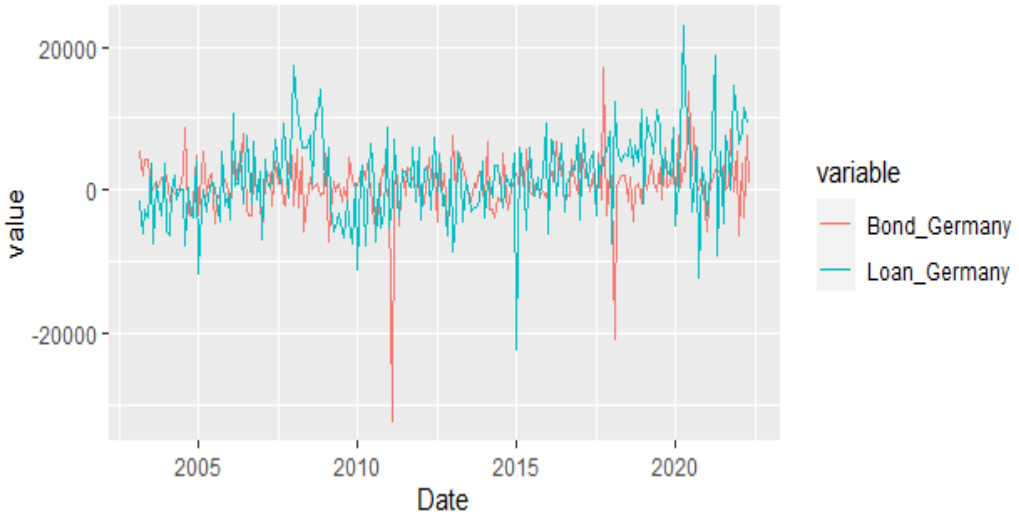


Figure 15 Net issue of bonds and loans in Germany. Values in Million EUR. (Net issue calculated as the difference in the monthly outstanding amounts). Data retrieved from the ECB data warehouse. (Own illustration).

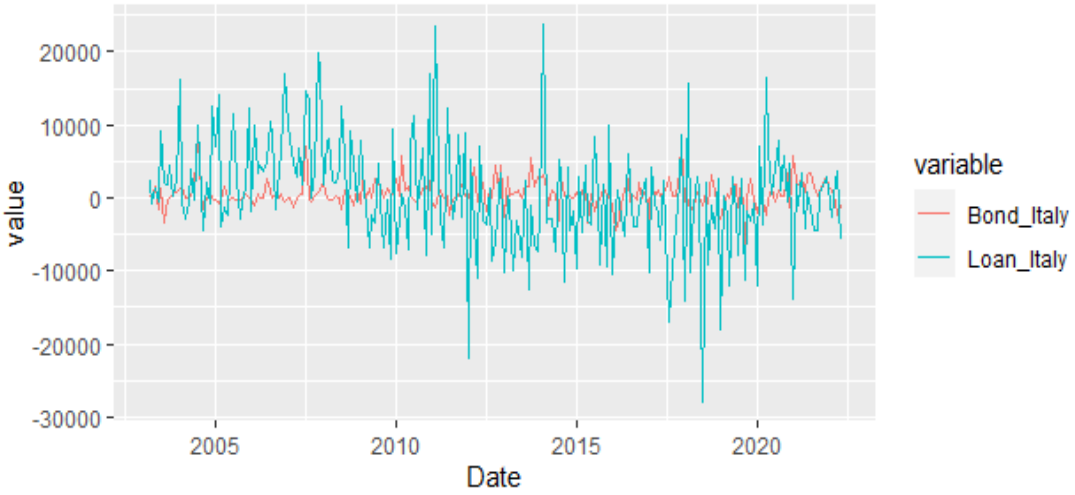


Figure 16 Net issue of bonds and loans in Italy. Values in Million EUR. (Net issue calculated as the difference in the monthly outstanding amounts). Data retrieved from the ECB data warehouse. (Own illustration).

Figure 17 Gross domestic product at market prices - Euro area 19 (fixed composition) - Domestic (home or reference area), Total economy, EUR, Chain linked volume (rebased), Growth rate, over 1 year, Calendar and seasonally adjusted data. Data retrieved from the ECB data warehouse. (Own illustration).

4.2 Exploratory data analysis. Granger Causality Test

The objective of this section is to explore the interdependency of variables through the Granger Causality Test. The main goal is to establish whether one variable can be used as a predictor for the other. The Granger Causality Test is a statistical technique that identifies causal relationships between two time series by analyzing the statistical significance of coefficients in a linear regression model that includes lagged values of both series. When the coefficient of the lagged values of one time series is statistically significant in forecasting the other time series, then it suggests that the first time series is Granger-causal for the second.

The present study focuses on testing three variables related to the primary corporate financing instruments. The first variable pertains to the gross issues of debt securities by NFCs, which is available on a monthly basis but ends abruptly in April 2022. Unfortunately, the data on debt securities after that date are not available even in the databases of the national banks (Bank of Italy, Bank of France, Deutsche Bundesbank). Therefore, the study period covers January 2003 until April 2022. The other two variables considered are the gross issues of shares listed by NFCs and the bank business volume regarding loans granted to NFCs for new businesses and renegotiation. These variables are trimmed to the same time window for congruence purposes. Companies often opt for bank debt instruments due to their flexibility and the ability to redefine conditions during economic stress. Hence, the analysis includes both new bank loan issuances and renegotiations, which represent a significant segment of the banking business. Bonds, on the other hand, are less flexible in terms of revising the straining conditions, and once the coupon has been defined, it is unlikely that the issuing company will be able to redesign the characteristics. The obtained results for each country differ significantly from one another. In France, which boasts the most developed bond market in Europe in terms of liquidity and business volumes, the highest number of significant coefficients is observed. The behavior of the bond variable helps to explain the loan variable's evolution at lags of two and three, and vice versa. This relationship of interdependence implies that these two instruments could be interchangeably used by companies and fully integrated into their financial strategies. Additionally, a relationship of interdependence between the variables of bonds and equity, and equity and bonds, albeit with slightly less significance, is observed. In contrast, little to no integration is recorded between loans and equity.

		Italy		France		Germany	
Description	lags	p_value	sign	p_value	sign	p_value	sign
bond ~ equity	1	0.305		0.819		0.560	
bond ~ equity	2	0.327		0.048	**	0.030	**
bond ~ equity	3	0.455		0.052	*	0.014	**
equity ~ bond	1	0.835		0.012	**	0.192	
equity ~ bond	2	0.299		0.040	**	0.542	
equity ~ bond	3	0.493		0.138		0.020	**
bond ~ loan	1	0.021	**	0.359		0.332	
bond ~ loan	2	0.064	*	0.012	**	0.703	
bond ~ loan	3	0.104		0.000	***	0.520	
loan ~ bond	1	0.067	*	0.685		0.396	
loan ~ bond	2	0.041	**	0.036	**	0.739	
loan ~ bond	3	0.008	***	0.009	***	0.902	
equity ~ loan	1	0.795		0.685		0.795	
equity ~ loan	2	0.772		0.684		0.442	
equity ~ loan	3	0.755		0.040	**	0.000	***
loan ~ equity	1	0.792		0.314		0.254	
loan ~ equity	2	0.036	**	0.741		0.269	
loan ~ equity	3	0.024	**	0.462		0.022	**

Table 6 Granger Causality Test.

In both Italy and France, the relationship between bonds and loans demonstrates a strong interdependence. Historical series data reveal that one variable helps to explain the other and vice versa, with significant coefficients appearing for one, two, and three lags. In contrast, the situation in Germany differs from that of Italy and France, with no significant bond and loan/loan and bond coefficients observed at any considered delay. However, a Granger-causal relationship is evident between the two debt instruments and equity in both directions, particularly when considering three delays.

The findings for France and Italy support the output presented in Kaya and Wang's aggregate-level study, indicating that the substitution process has since advanced further, as highlighted in the literature review section, thanks to the ECB's CSPPs and the widening gap between corporate bond and bank loan costs, with the former settling at lower average levels (Kaya & Wang, 2016). In contrast, the German data reflects a distinct output, indicating no significant interaction between bonds and loans. Given the positive interrelationships among the three financing instruments analyzed across the three countries, it was considered pertinent to formulate an OLS model utilizing two of the financial instruments as predictors to estimate the value of the third financial instrument.

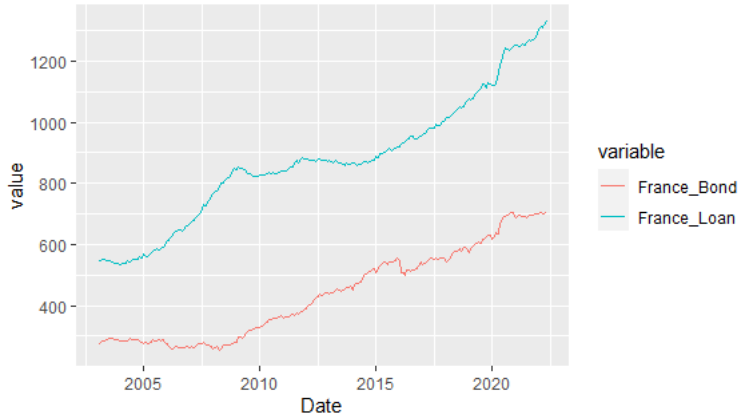


Figure 18 Outstanding amount of loans and debt securities issued by NFCs in France (stocks at the end of the period). Bn of EUR. Data retrieved from the ECB data warehouse. (Own illustration).

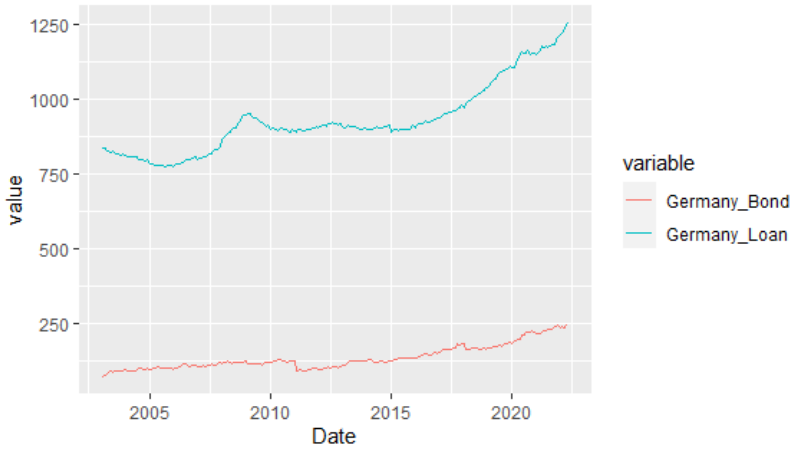


Figure 19 Outstanding amount of loans and debt securities issued by NFCs in Germany (stocks at the end of the period). Bn of EUR. Data retrieved from the ECB data warehouse. (Own illustration).

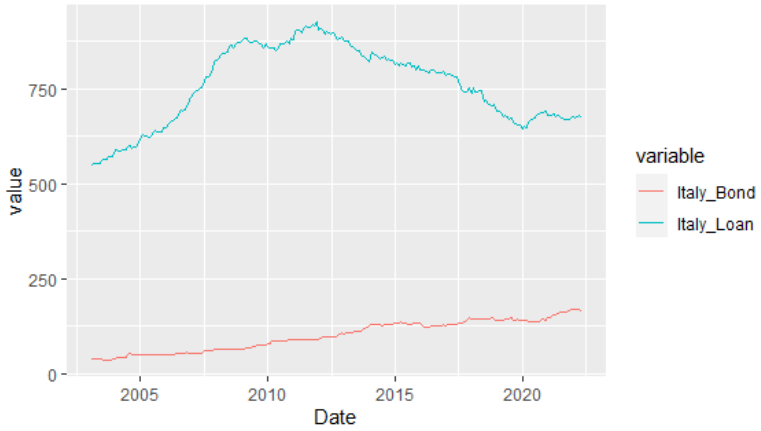


Figure 20 Outstanding amount of loans and debt securities issued by NFCs in Italy (stocks at the end of the period). Bn of EUR. Data retrieved from the ECB data warehouse. (Own illustration).

Upon analyzing the dynamics and evolution of business volumes of two debt instruments across multiple countries, notable disparities emerge. In France, the bond market experienced a sharp increase after the abrupt halt of loan business volumes, which occurred in the aftermath of the 2008 financial crisis. The growth rate of the bond market has since remained sustained and steady, although a new surge in loan business volumes has been observed following the 2020 pandemic crisis, acting as a shock absorber for companies affected by economic upheavals. Conversely, the growth of the bond market has gradually flattened, and stagnation has taken hold.

The German market has witnessed stagnant loan business volumes since the 2002 crisis, with no noteworthy substitution by a rapid expansion in the bond sector. Instead, the growth of this financial instrument has remained relatively constant and modest throughout the last decade. After the 2020 pandemic crisis, there was a significant resurgence in loan volumes, while the growth of bonds has been comparatively more restrained.

In contrast, the Italian market presents a distinct case. After experiencing unbridled growth until 2008, loan business volumes plummeted following the subprime financial crisis. Conversely, the debt securities market has grown substantially and consistently. Following the COVID-19 crisis, loan volumes experienced a massive resurgence, with new bond issues promptly following suit, resulting in a notable surge in the sector's business volumes.

At a general level, it is evident that the loan market is considerably more cyclical and susceptible to rapid changes following the overall trend of the economy, whereas the bond market has exhibited growth since the introduction of the single currency and is not subject to the repercussions of macroeconomic trends. Consequently, it has demonstrated a greater degree of resilience and anti-cyclicality in the three countries under scrutiny. This evidence of a more robust and counter-cyclical bond market is not new and has been previously documented in academic research. Duarte and Venkataraman, for instance, compared the economic cycles and economic flows of the bond market and bank loans in Europe from 1998 to 2011, discovering that the bond market is marked by greater stability than bank loans and is capable of responding more quickly to changes in market conditions (Duarte & Venkataraman, 2014). Similarly, a study by Holm-Hadulla, Mathur,

Mohanty and Rautanen explored the dynamics of the bank credit transmission channel and demonstrated that this channel is much more cyclical in markets where the bank loan market is predominant, compared to those with a more developed bond market (Holm-Hadulla, Mathur, Mohanty & Rautanen, 2017). Furthermore, a study by Porzio and Sampagnaro found that companies with access to the bond markets tend to prefer this option, as the bond market is more resistant to economic fluctuations (Porzio & Sampagnaro, 2018). Overall, the bond market offers greater resilience and anti-cyclicality compared to the loan market, which is more susceptible to the overall trend of the economy. These findings have been previously documented in academic research and provide valuable insights into the financial instruments available to companies and the potential risks and benefits associated with each option.

4.3 Exploratory data analysis. OLS Method

In order to gain insights into the impact of inflation on the financial instruments of interest, a linear regression model will be employed to analyze the data. The variables selected for this analysis are as follows:

- Log_Bond: the natural logarithmic transformation of the gross issues of debt securities by NFCs.
- Log_Equity: the natural logarithmic transformation of gross issues of listed shares by NFCs.
- Log_Loan: the natural logarithmic transformation of bank business volumes - loans to corporations (new business and renegotiation).
- Loan demand: the variable collected in the context of the BLS conducted by the ECB to measure loan demand, specifically the bank senior officers' indication of whether the demand for loans by companies has increased or decreased in the previous three months.
- HICP: the independent variable of greatest interest that measures the level of inflation using the Harmonized Index of Consumer Prices.
- Price Differential: the variable that measures the spread between the cost of bank loans for companies and the cost linked to bonds yields.
- VSTOXX_50: a volatility index based on the European options market. It is calculated based on European options on the stocks in the Euro Stoxx 50 index,

which comprises the 50 largest companies in the Eurozone. It measures the implied volatility of short-term options on Euro Stoxx 50 stocks. In essence, the index provides a gauge of fear or uncertainty in European financial markets, as option prices tend to rise when markets are unstable or uncertain. Traders and investors use the VSTOXX 50 as a tool to assess the level of risk in European markets and to evaluate the efficacy of their investment strategies. A high VSTOXX 50 suggests a high level of uncertainty in the market and may indicate an increase in market volatility, while a low VSTOXX 50 indicates greater stability.

- EURIBOR: the Euribor 1 year-level.
- GBBY: the Euro Area - 10-year Government Benchmark Bond Yield.

4.3.1 OLS Method France

Through analysis of the correlations between the variables outlined within the French context, a significant correlation between GBBY and Euribor (0.85) and between GBBY and the price differential (-0.69) is revealed. To mitigate any potential issues with multicollinearity, it was decided to exclude this variable from our model.

	Log_Bond	Log_Equity	Log_Loan	Loan_demand	HICP	Price_differential	VSTOXX_50	Euribor
Log_Bond								
Log_Equity	0.04							
Log_Loan	0.09	0.24**						
Loan_demand	0.09	0.19**	0.39***					
HICP	0.13*	-0.23**	0.12	-0.14*				
Price_differential	-0.14*	0.18**	0.11	0.37***	-0.23**			
VSTOXX_50	-0.13	-0.24**	-0.05	-0.31***	0.04	-0.52***		
Euribor	0.43***	-0.13*	-0.21**	-0.29***	0.41***	-0.52***	0.20**	
GBBY	0.29***	-0.18**	-0.46***	-0.41***	0.34***	-0.69***	0.24**	0.85***

Table 9 Correlation plot for the OLS model referred to France.

The OLS analysis conducted for France yields thought-provoking results that shed further light on the relationships between the two financial instruments under examination and other macroeconomic variables included as independent variables in the model. Notably, upon examination of the Log Equity coefficients in both models, it is observed that only the coefficient in Model 1 (y = Log Loan) is significant and demonstrates a positive sign.

This significant finding suggests that the issuance of new public shares by a company increases the likelihood of securing a bank loan. This effect can be attributed to the fact that, by issuing new shares, a company reduces its leverage and bolsters its solvency in the eyes of lenders. Consequently, banks are more inclined to extend loans to such companies. Moreover, the issuance of new shares on the stock exchange enhances a company's reputation and visibility, which positively impacts the confidence of investors and creditors. Conversely, this effect is not observable for bonds. Indeed, it should be noted that the coefficient estimated for Model 2 (y=Log Bond) is not significant and therefore it is not possible to infer evidence from the estimate itself.

OLS France

	Dependent variable:					
	Log Loan Model (1)			Log Bond Model (2)		
	Estimate	Std. Error	Sign.	Estimate	Std. Error	Sign.
Log Bond	0.134	(0.051)	***	-	-	-
Log Loan	-	-	-	0.025	(0.085)	***
Log Equity	0.074	(0.018)	***	-0.006	(0.024)	
Loan Demand	0.006	(0.001)	***	0.003	(0.002)	*
HICP	**0.010**	**(0.019)**	***	**-0.043**	**(0.026)**	*
Price Differential	-0.028	(0.035)		-0.028	(0.045)	
VSTOXX 50	0.006	(0.002)	**	-0.010	(0.003)	***
Euribor	-0.068	(0.015)	***	0.141	(0.018)	***
Constant	8.035	(0.542)	***	8.117	(0.828)	***

	Model (1)	Model (2)
Observations	232	232
R^2	0.308	0.289
Adjusted R^2	0.286	0.267
Residual Std. Error (df = 224)	0.262	0.340
F Statistic (df = 7; 224)	14.230***	13.035***
Note: * p<0.1; ** p<0.5; *** p<0.01		

Table 10 OLS Model for France. (1) Shows the results for the equation with Log Loan as a dependent variable and (2) shows the results for the equation with Log Bond as a dependent variable. The estimations are provided for each dependent variable together with the standard errors, the latter reported in parenthesis.

The analysis reveals that Loan Demand has a substantial positive impact on loan issuance, as evidenced by the positive coefficient, indicating that a 1% increase in Loan Demand corresponds to a 0.6% increase in bank loans granted by financial institutions. However,

an increase in demand for loans does not result in a reduction in the volume of bonds issued. Moreover, the significant and positive coefficients for both Log Loan and Log Bond suggest that firms utilize both instruments in tandem without hindering the growth of either.

Indeed, the differentiation of debt instruments on the liability side of the balance sheet confers numerous advantages to companies, enabling them to manage their capital costs, optimize their risk management strategies, and ensures flexibility in their debt repayment schedules more effectively. By leveraging a diverse range of financial instruments, firms can navigate the complexities of modern finance with greater precision and ease.

Furthermore, the Price Differential coefficient for bank loans exhibits a negative sign, indicating that a 1% increase in the spread between the cost of the bank loan and that of the bond debt leads to a 2.8% decrease in loan issuance. However, this effect is not evident in reverse for bonds. This finding suggests that the price elasticity of bank loans is higher than that of bonds.

The Euribor coefficient appears to lend support to this hypothesis, as it is significant in both models and indicates that a 1% increase in the general level of reference interest rates leads to a 6.8% decrease in loan issuance but a 14.1% increase in bond issuance. In summary, it can be concluded that bank loans seem to be highly susceptible to market price trends, while bonds are characterized by more inelastic demand.

The Volatility has a diametrically opposed effect on the two financial instruments. As market volatility surges, the more speculative fringes of investors tend to concentrate their investments in high-risk, high-reward stock markets. Such investors, lured by the potential for capital gains, readily direct their funds towards the stock market, thereby draining capital away from the bond market.

This has led to a decline in the volume of bond issues, particularly as volatility increases. Conversely, during times of market uncertainty and volatility, companies often seek financial stability and security through bank loans, which provide a reliable means of funding.

The impact of inflation is not consistent across the two independent variables in the two models. Specifically, an increase of 1% in the general level of consumer prices leads to a

4.3% reduction in the level of bond issues while causing a 10% increase in loan issuance. The OLS results are consistent with those obtained through T-tests, which indicate an increase in the average net loan issuance from 3.2 bn (pre-inflation) to 4.9 bn (during inflation times) and a decrease in average net bond issuance from 1.9 bn (pre-inflation) to 1.2 bn (during inflation times). These findings are noteworthy and should be complemented by an analysis of the impact of price on the emissions of the two instruments.

It is worth noting the correlation between the HICP and the bond issuance in terms of direction and strength. In contexts marked by high inflation, there is often an implementation of restrictive monetary policies that push the market interest rates upwards. This causes an increase in the cost of debt tied to interest to be paid or, with the same interest rate, a decrease in the amount of capital raised by companies. It is also well-known that interest rates and debt securities prices are intertwined, with the bond price or value falling as interest rates rise.

The case of the Silicon Valley Bank (SVB), which unfortunately made headlines in financial news, serves as a cautionary tale. The bank faced a severe liquidity crisis, primarily due to its investment strategies that nearly led it to bankruptcy. SVB invested heavily in long-term assets, including bonds and mortgage-backed securities, which are fixed-income financial instruments. With the increase in current market interest rates, they were quickly and dramatically devalued according to the laws of supply and demand, given the presence of similar instruments in the market that pay much higher returns.

The recent upsurge in interest rates has generated a disincentive for corporations to finance their operations through bonds, due in part to the higher cost of the coupons associated with such debt issuances. Conversely, investors have been drawn to the bond market during periods of high interest rates, as this generally results in higher yields, *ceteris paribus*.

As a consequence, it is evident that during times of rampant inflation, the bond market experiences a decline in supply from corporations due to the elevated cost structure involved. The propensity of companies to issue bonds has been curtailed by the unexciting prospect of paying exorbitant coupon rates within today's high interest rate environment. This confluence of factors, which emanates from inflationary pressures, has deleteriously

cooled down the bond market. The central banks' adoption of restrictive monetary policies, accompanied by their consequent elevation of interest rates at large, has played a role in precipitating this state of affairs.

Although inflation typically results in higher interest rates due to monetary policies designed to combat it, and despite the fact that loan demand appears to be more responsive to changes in interest rates than bond demand, the issuance of loans appears to rise in tandem with inflation.

To disentangle this conceptual puzzle, a contextualization is necessary. Specifically, the current inflationary environment is a direct consequence of the pandemic crisis that erupted in the first half of 2020.

During this period, economic conditions compelled firms to make significant sacrifices in order to cope with repeated lockdowns and the suspension of normal business operations. To address liquidity challenges, many companies turned to bank loans as a means of quickly navigating a state of impasse and pervasive uncertainty.

However, with the gradual return to normalcy, companies have been unable to bridge the deepening gap between supply and demand. In fact, following the costs and constraints imposed by the pandemic period, demand has surged and is now widely considered to be one of the primary drivers of the current runaway inflation (ECB, 16 November 2021). As previously noted in our T-test analysis, companies have drawn upon debt capital to support their renewed activities and reinforce their operations to meet this growing demand. Amidst this complex interplay of capital, resources, supply, and demand, bank lending has experienced a resurgence.

However, the same cannot be said for bonds. This trend is also confirmed by the analysis of the Bank of France which embrace the financial year 2022. During this year, it appears that companies have shifted their preference towards bank credit for borrowing, resulting in a net flow of 90.3 bn EUR over the past 12 months. This amount is more than twice the figure observed in the previous year of 2021 (43.7 billion EUR). On the other hand, debt securities issuance has decreased by 6.5 bn EUR over the course of the year (Banque de France, 2023).

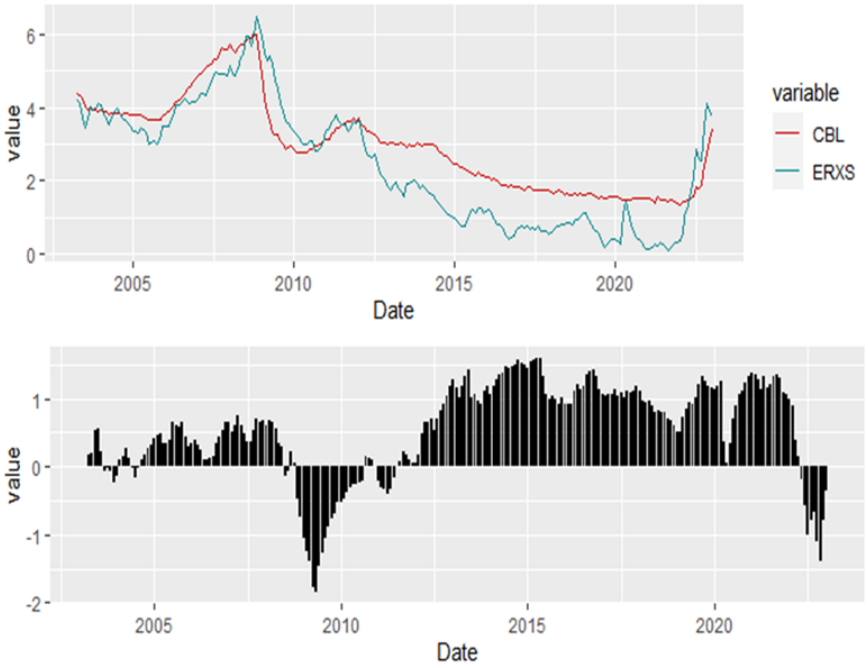


Figure 21 Cost of Borrowing Loan compared to ERXS (total return of a portfolio of "conventional" bonds). Variables in %. The spread illustrated in black is obtained as the difference between Cost of Borrowing Loan and the ERXS. Data derived from the ECB data warehouse. (Own illustration).

Based on the analysis by the Bank of France, the recent trend of companies preferring bank loans over corporate bonds can largely be attributed to the costs associated with these debt instruments. Notably, during the last quarter of 2022, the costs of bank loans were observed to have fallen below the average bond yields, thus making bank loans a more attractive financing option for companies (Banque de France, 2023).

The OLS model performed here includes a variable, namely the price differential, which reflects the costs of debt for bonds and loans in the European landscape. By plotting the constituent elements of this variable, we can arrive at the same evidentiary conclusion. Specifically, the cost of borrowing loans (CBL) and the average index of bond yields (ERXS) are two such elements. Since April 2022, the CBL has fallen below the average levels of the ERXS. As a result, the spread between CBL and ERXS has shifted into negative territory.

However, in addition to cost-related factors, there may be other reasons that have led companies to favor bank loans over bonds in this period of significant inflation.

Revisiting the findings of the T-test analysis, it can be inferred that companies have had to finance their working capital and inventories to meet the heightened demand for goods following the pandemic and the elevated operations costs.

Certain characteristics of bank loans have made them particularly suitable for financing these corporate needs, as compared to bonds. Firstly, loans are typically more flexible than bonds and often incorporate early repayment clauses that enable companies to pay off the loan without incurring any penalties. Bonds, on the other hand, are less flexible and do not offer the same option. In this regard, companies may have found it more advantageous to finance their inventories and working capital through loans, since the expansion of their operating activities to satisfy the increased demand is perceived as a temporary phenomenon.

Consequently, companies desire to remain agile and, in the event of a reduction or normalization of demand or a normalization of costs, must be able to pay off the debt they have incurred in order to fulfill it.

Another factor that may have played a pivotal role is time. In order to meet the surging demand expeditiously, companies may have preferred financial instruments with shorter issuance times and streamlined issuance procedures. While it is important to note that the issuance times of bonds and loans can vary depending on the specific requirements of the issuer and the prevailing financial climate, it is generally understood that bank loans can be issued more quickly than bonds.

This is due to the fact that most corporate bond issuances entail a more rigorous credit assessment process, which consequently leads to extended issuance times. Such assessments include evaluating the issuer's ability to repay the loan, assessing the creditworthiness of the issuer, and examining the issuer's ability to guarantee interest payments.

Moreover, the issuance of bonds necessitates the preparation of detailed documentation, which is then subjected to regulatory scrutiny. Conversely, bank loans can be issued more rapidly since the credit evaluation process is typically less meticulous, and the loans are often secured by some form of collateral. Additionally, the long-standing relationship

between banks and companies means that the bank has a wealth of information about the customer, which can expedite the issuance process.

The observed debt collection patterns among French companies can be situated within a larger context. Unlike other countries in the Eurozone, such as Spain and Italy, NFCs in France have seen their indebtedness levels increase since 2011, despite having undergone a double-dip recession during the GFC and the European sovereign debt crisis of 2011. This discrepancy could be partially ascribed to the degree of fiscal support extended to these corporations.

The French government has introduced mechanisms for corporate financing that have successfully prevented widespread bankruptcies but have also fostered an environment conducive to NFC borrowing. Notably, the implementation of the "fonds de solidarité" to avert large-scale business closures, along with state-guaranteed loans amounting to more than 140 bn EUR, constituted some of the most significant fiscal measures implemented to support corporate financing in France during the pandemic period.

Consequently, these measures may have contributed to the comparatively higher levels of corporate indebtedness observed in France vis-à-vis other European economies (Dees, Gebauer, Goncalves & Thubin, 2022).

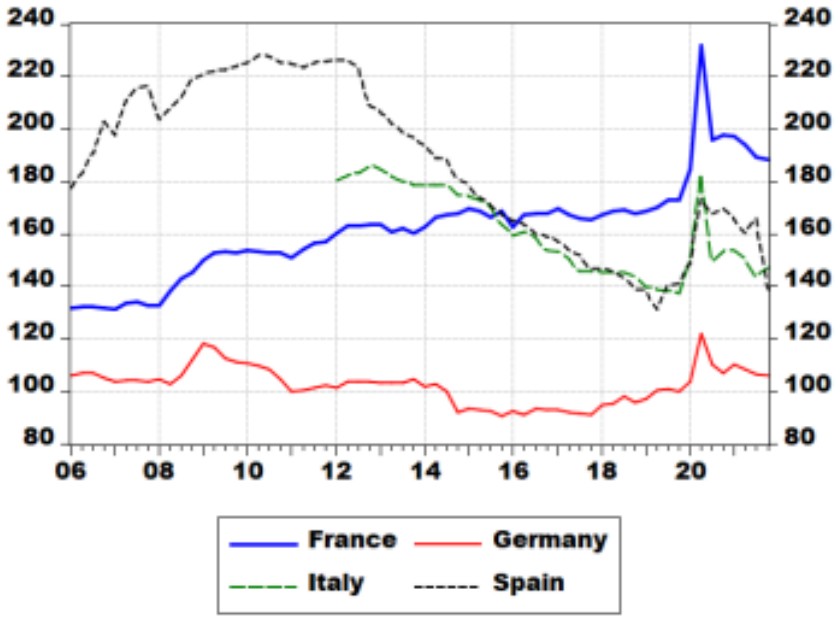


Figure 22 NFC indebtedness (bank loans and debt securities, % of corporate value-added) (Dees, Gebauer, Goncalves & Thubin, 2022).

4.3.2 OLS METHOD GERMANY

From the observation of the variables for Germany strong correlations do not emerge between the dependent variables and therefore problems of multicollinearity are thus averted. The only variable to be omitted is once again GBBY which demonstrates marked interactivity especially with Euribor (0.85) and price difference (-0.69). Once the independent variables have been selected, the two regressions of interest are rerun.

	Log_Bond	Log_Equity	Log_Loan	Loan_demand	HICP	Price_differential	VSTOXX_50	Euribor
Log_Bond								
Log_Equity	0.02							
Log_Loan	-0.13*	0.23**						
Loan_demand	-0.22**	0.10	0.43***					
HICP	0.18**	0.11	0.12	0.01				
Price_differential	-0.48***	0.04	0.09	-0.02	-0.04			
VSTOXX_50	0.14*	-0.15*	0.08	0.07	-0.05	-0.52***		
Euribor	0.71***	-0.05	-0.25**	-0.15*	0.19**	-0.52***	0.20**	
GBBY	0.60***	-0.15*	-0.53***	-0.27***	0.09	-0.69***	0.24**	0.85***

Table 11 Correlation plot for the OLS model referred to Germany.

In a manner similar to France, the variables of Log Bond and Log Loan are deemed significant with a positive coefficient. This indicates that during favorable conditions for debt issuance, companies are likely to avail both bank loans and bonds in the market. Furthermore, this analysis suggests that the use of one financial instrument does not preclude the usage of the other. The study reveals that the Equity variable is only significant in Model 1, with a positive coefficient. This indicates that as Equity increases by 1%, the gross issuance of loans also increases by 0.031%, which aligns with previous research.

Equity issuance leads to a decrease in leverage and an improvement in debt ratios, which acts as a primary driver for bank loan issuance. However, since bond loans rank lower in the capital structure hierarchy than bank loans, this effect is less pronounced. Bank debt, especially revolver and term loans, are typically given higher seniority in the event of bankruptcy or liquidation, resulting in a higher chance of receiving full recovery. These findings are supported by previous literature (Bhattacharya & Ravikumar, 2019). Loan demand is significant in both models, but the sign is positive in the Model 1 and negative in Model 2. This indicates that a 1% increase in loan demand results in a contraction of

1.1% in bond issuance. However, the coefficients of Loan Demand and Log Loan variables in the Bond model measure slightly different forces, and caution must be exercised when interpreting the discrepancy between them. Pure demand tracks the substitution effect and shows that as demand for loans decreases due to the health of the banking sector, the demand for bonds increases. The price differential is positive only in Model 2, and its significance suggests that as the price spread between the CBL and the cost related to bond yield increases by one percentage point, bond issuance volumes contract by 22%. This discovery presents a notable contrast to the findings in France.

OLS Germany

	Dependent variable:					
	Log Loan Model (1)			Log Bond Model (2)		
	Estimate	Std. Error	Sign.	Estimate	Std. Error	Sign.
Log Bond	0.069	(0.032)	**	-	-	-
Log Loan	-	-	-	0.298	(0.137)	**
Log Equity	0.031	(0.010)	***	0.015	(0.021)	
Loan Demand	0.009	(0.001)	***	-0.011	(0.003)	***
HICP	**0.030**	**(0.012)**	**	**0.020**	**(0.036)**	
Price Differential	0.041	(0.029)		-0.220	(0.059)	***
VSTOXX 50	0.005	(0.002)	***	-0.006	(0.004)	
Euribor	-0.051	(0.013)	***	0.250	(0.023)	***
Constant	10.211	(0.299)	***	5.750	(1.501)	***

	Model (1)	Model (2)
Observations	232	232
R^2	0.307	0.554
Adjusted R^2	0.286	0.540
Residual Std. Error (df = 224)	0.216	0.449
F Statistic (df = 7; 224)	14.198***	39.714***
Note: * p<0.1; ** p<0.5; *** p<0.01		

Table 12 OLS Model for Germany. (1) Shows the results for the equation with Log Loan as a dependent variable and (2) shows the results for the equation with Log Bond as a dependent variable. The estimations are provided for each dependent variable together with the standard errors, the latter reported in parenthesis.

When examining the absolute price while considering the trends in the Euribor reference rate, the results are consistent with those found in France. Specifically, when the Euribor reference rate increases by 1%, bond issuance experiences a 25% increase, and loans experience a 5.1% contraction. This is due to the fact that bank loan prices are generally

fixed at a floating rate that is closely linked to the performance of a reference interest rate, such as the Euribor, with an agreed-upon spread. Conversely, bonds are typically priced at a fixed rate. Market volatility is found to be significant only in the Model 1, indicating that as market volatility increases by 1%, loan issuance increases by 0.5%. This finding is consistent with the assumption that as the uncertainty, risk, and volatility of markets increase, many companies rely on bank debt as a safer financial instrument that is protected from market fluctuations and unpredictability.

Finally, it can be noted how a 1% rise in the level of general prices entails a notable 3% increase in loans, whereas no conclusive inference can be drawn from the bond coefficient, since it is designated as not significant. The findings of the model indicate that inflation has created an environment conducive to the flourishing of bank loans on corporate bonds, a notion corroborated by research conducted by Deutsche Bank. According to this research, in the second quarter of this year in Germany, there was a remarkable surge in loans taken out by businesses and self-employed individuals, totaling 35 bn EUR (+2.3%) in response to heightened costs and economic uncertainties. Notably, the volume of loans increased by 7.6% from the previous year, driven predominantly by the surging demand for short-term loans within the industry sector (Schildbach, Schattenberg & Schneider, 2022).

As per the findings of the survey, the banking lending domain, which has witnessed a tumultuous history, has undergone a remarkable surge in Q2 2022. The percentage growth rates on a quarter-on-quarter basis reached an unprecedented level not seen since 1999, with an influx of 35.4 bn EUR into the market. According to the authors, the achievement was made possible primarily due to the interplay of a series of contributing factors, namely, the Ukrainian war outbreak, the energy crisis, and inflation. These events have served as exogenous shocks for companies, prompting a pressing need for liquidity, which is largely driven by escalating costs across all inputs, ranging from raw materials to energy (Schildbach et al., 2022).

Among the industries that have recognized the pressing need for liquidity, several have emerged as prominent players, including the chemical sector, a cornerstone of German exports. This sector has experienced a significant surge in bank lending, with a remarkable increase of 42% compared to the previous year. Additionally, the rubber and

artificial materials sector has also exhibited strong growth in the contraction of bank loans, with a notable rise of 19%, followed closely by the electronics sector, which has recorded an increase of 15%. Furthermore, the automotive sector has also demonstrated a noteworthy double-digit growth in bank lending (Schildbach et al., 2022). The real estate sector also experienced a leap: in this case, the increase in bank loans granted to companies in this sector was close to 9%. The bank lending impulse for commercial properties has undergone a marginal decline of 4%, whilst the tourism and restaurant sector has recorded a modest increase of 1%, which stands as the lowest value since 2015 after experiencing a remarkable boost during the COVID-19 crisis. In contrast, telecommunications, consulting, and advertising - services that are closely related to businesses - have demonstrated resilient growth in bank lending, with a steady increase of 6%. Notably, other sectors have exhibited a robust expansion in loan volume, particularly in the realm of trade, which witnessed a surge of 13% compared to the preceding year, and in construction, which experienced an increase of 12%.

According to the statistics, the mining/extraction sector has recorded a significant increase of 9%, while the transportation sector has experienced a decline of 3% and ranks last among all economic sectors.

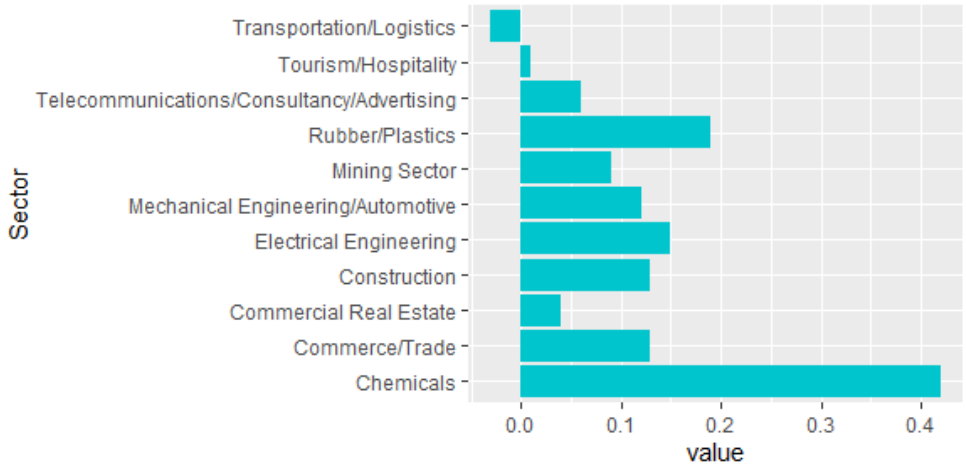


Figure 23 Percentage growth of bank lending contraction based on comparison between Q2 2022 and Q1 2021. Breakdown by economic sector. (Schildbach, Schattenberg & Schneider, 2022). (Own illustration).

The analysis reveals a remarkable trend in the type of loans requested by businesses, as short-term loans have emerged as the most popular option. Notably, demand for loans with a duration of less than a year has experienced a significant surge, indicative of the

challenges faced by businesses in meeting their immediate funding requirements. The latest data indicates a staggering 24% increase in demand for short-term loans during Q2 of 2022, further corroborating the notion that such loans are frequently sought to fund current operating activities, rather than long-term investments in fixed assets.

4.3.3 OLS Method Italy

	Log_Bond	Log_Equity	Log_Loan	Loan_demand	HICP	Price_differential	VSTOXX_50	Euribor
Log_Bond								
Log_Equity	0.05							
Log_Loan	0.12	0.16*						
Loan_demand	-0.03	0.14*	0.20**					
HICP	-0.26***	0.03	0.03	-0.24**				
Price_differential	0.29***	-0.19**	-0.27***	0.11	-0.37***			
VSTOXX_50	-0.18**	0.09	0.24**	-0.09	0.19**	-0.52***		
Euribor	-0.45***	0.18*	0.34***	0.07	0.50***	-0.52***	0.20**	
GBBY	-0.43***	0.16*	0.14*	-0.17**	0.49***	-0.69***	0.24**	0.85***

Table 13 Correlation plot for the OLS model referred to Italy.

Upon analysis of the variables in the Italian market, it is evident that there is no significant correlation between the independent variables, with the exception of GBBY with Euribor (0.85) and Price differential (-0.69).

Similar to the approach taken in the analysis of the other two countries, GBBY has been omitted. Examination of the models reveals that both loans and bonds as independent variables hold significant value in both models, with a positive estimate in both cases. This result aligns with what was observed in the models of the other two countries. However, equity issues are only significant in Model 2, unlike the findings of the French and German models.

Regarding the impact of inflation, Italy presents an opposite trend when compared to other countries. In fact, a 1% increase in the general price level results in a 2% decrease in the issuance of bank loans. Although the HICP coefficient in Model 2 displays a positive sign, it lacks significance, making it impossible to draw any conclusive inferences.

This countertrend observed in Italy must be understood within the broader context of the general crisis affecting the loan market. According to the literature, the Italian credit market has experienced an irreversible decline following the GFC, particularly due to

banks' reluctance to provide loans to all types of firms, except for large ones (Russo, Nigro & Pastorelli, 2022).

OLS Italy

	Dependent variable:					
	Log Loan Model (1)			Log Bond Model (2)		
	Estimate	Std. Error	Sign.	Estimate	Std. Error	Sign.
Log Bond	0.057	(0.010)	***	-	-	-
Log Loan	-	-	-	2.424	(0.433)	***
Log Equity	-0.002	(0.006)		0.090	(0.039)	**
Loan Demand	0.002	(0.001)	***	-0.008	(0.005)	
HICP	**-0.020**	**(0.011)**	*	**0.035**	**(0.073)**	
Price Differential	-0.042	(0.025)		0.240	(0.166)	
VSTOXX 50	0.004	(0.002)	**	-0.016	(0.012)	
Euribor	0.068	(0.011)	***	-0.496	(0.067)	***
Constant	10.087	(0.093)	***	-18.579	(4.560)	***

	Model (1)	Model (2)
Observations	204	204
R^2	0.340	0.361
Adjusted R^2	0.317	0.338
Residual Std. Error (df = 224)	0.176	1.154
F Statistic (df = 7; 224)	14.442***	15.791***
Note: * p<0.1; ** p<0.5; *** p<0.01		

Table 14 OLS Model for Italy. (1) Shows the results for the equation with Log Loan as a dependent variable and (2) shows the results for the equation with Log Bond as a dependent variable. The estimations are provided for each dependent variable together with the standard errors, the latter reported in parenthesis.

Between 2014 and 2017, the supply of credit to micro-enterprises and SMEs decreased significantly, leading to a tangible credit gap. Banks' tendency to select companies primarily based on their size rather than on their intrinsic risk based on balance sheet analysis may be due to various technical factors, including the high fixed costs associated with evaluating accounting documents. These costs are often high when compared to the low volumes to be placed in the case of SMEs, resulting in low margins. This trend has had a significant impact on the overall corporate credit sector, given that the majority of Italian businesses are SMEs. According to Istat's analysis, in 2020, 95.2% of businesses

were small businesses (maximum of 9 employees), employing 43.2% of the total employees (Istat, 2021). The banking sector's structural crisis, particularly in the area of business loans, has opened up new possibilities for business financing in Italy, such as the emergence of minibonds. These developments suggest a shift away from traditional bank-centric models towards alternative and innovative financing options.

Nevertheless, recent research suggests that amidst the tumultuous landscape of the COVID-19 pandemic, a modest yet noteworthy countertrend emerged in regard to the diminishing significance of bank credit. This was largely attributed to the introduction of loan guarantee schemes backed by the government, which acted as a pivotal force in boosting lending activity. Specifically, during the initial phase of the pandemic (Q2-2020), it was observed that each euro of full government guarantee coverage was associated with the issuance of approximately 84 cents of new loans. However, the credit multiplier for loans extended under alternative programs (with a 90% or 80% guarantee) was comparatively lower, at around 50-60 cents per euro of guarantee (Cascarino, Gallo, Palazzo & Sette, April 2022). This temporary surge in bank credit issuance backed by state guarantees has gradually subsided as the GDP started to recover and firms' liquidity needs softened. In general, government-backed loan guarantees have been instrumental in promoting lending activities. However, these measures have not produced emission peaks comparable to those observed in other countries. A recent report released by Confindustria reveals an upward trend in loan requests during the second quarter of 2022. Specifically, the report highlights a surge in demand for short-term loans to address liquidity needs. Additionally, there has been a noticeable increase in requests for funding to support inventories and working capital. Conversely, the report notes a decline in requests for financing new investments, while demand for debt restructuring or renegotiation has remained steady over the past year.

This pattern is consistent with developments observed in other countries, where companies are showing greater interest in credit due to liquidity concerns arising from rising energy costs (Confindustria, 2022). The impact of credit tightening and rising utility bills is reflected in the trend of the qualitative indicator of available liquidity in companies, which has experienced a sharp decline in 2022 compared to pre-crisis levels reached in 2021. While the situation is not as dire as in 2020, it is still a cause for concern. There also remains a sectoral gap, with consumer goods sectors facing more difficult

liquidity conditions compared to intermediate and, especially, instrumental sectors that have been able to limit the damage so far. Therefore, downstream companies appear to have a greater need for new credit to obtain liquid resources. Although there is a fundamental need to match demand, it is not certain that this will result in an increase in the bank loan market, as has been observed in other countries analyzed. In fact, the aid provided to companies in 2020 has heavily impacted the solidity of their balance sheets, causing the share of debt on total liabilities to rise significantly, reversing the trend of significant decline achieved in the previous decade. This aspect may act as a deterrent for banks to grant loans. Moreover, according to the Bank of Italy, there was a moderate tightening in credit standards during the first and second quarters of 2022. The offer has become less accommodating due to expectations of economic trends and the difficulties faced by some funding institutions on the markets and capital endowment, which have been exacerbated by the adoption of restrictive monetary policies by the ECB. This indication is corroborated by the ISTAT survey, which shows that the share of manufacturing companies that are unable to obtain requested loans increased in the first half of 2022, surpassing the 2021 lows (7.3% in June, up from 3.9%). The ISTAT data also signals that access to credit has become much less favorable: -20.6 the balance in June 2022, from -0.3. of June of the previous year. Therefore, a significant portion of industrial enterprises are not obtaining the requested loans, which are mainly for the liquidity necessary for their operations (Confindustria, 2022). To summarize, despite a significant demand for bank debt, the inability of the supply to keep up due to the failure of state aid has hindered the proliferation of the loan market in Italy in time of inflation.

4.4 EXPLORATORY DATA ANALYSIS. FIXED EFFECT PANEL MODEL

Fixed Effect Panel Model

	Dependent variable:					
	Log Loan Model (1)			Log Bond Model (2)		
	Estimate	Std. Error	Sign.	Estimate	Std. Error	Sign.
Log Bond, lag 3	-0.013	(0.010)		-	-	-
Log Loan, lag 3	-	-	-	0.016	(0.158)	
Log Equity, lag 3	0.009	(0.006)	*	-0.011	(0.011)	
Loan Demand, lag 3	0.005	(0.001)	***	-0.008	(0.003)	***
HICP, lag 3	**0.040**	**(0.010)**	***	**-0.097**	**(0.041)**	**
Price Differential, lag 3	0.022	(0.019)		0.081	(0.076)	
VSTOXX 50, lag 3	0.001	(0.001)		-0.001	(0.005)	
Euribor, lag 3	-0.015	(0.008)	*	0.032	(0.031)	

	Model (1)	Model (2)
Observations	687	687
R^2	0.096	0.020
Adjusted R^2	0.084	0.007
F Statistic (df = 7; 677)	10.236***	2.006*

Note: * p<0.1; ** p<0.5; *** p<0.01

Table 15 Fixed effects panel model. The indices are country (France, Italy, and Germany) and time (2003-2022). All the variables employed are the same as in the OLS models. For further details, please refer to Table 14.

By employing fixed effects in the panel model, the findings presented in the OLS outputs are bolstered, revealing a more robust analysis. This involved cross-referencing the data pertaining to variables across all countries and lagging the independent variables by up to three periods, effectively mitigating any simultaneity effects. Notably, this approach allows for the observation of the impact of inflation in the previous quarter on the two financial instruments under examination, as is often the case in economic surveys.

From a technical standpoint, the model's R^2 values are rather limited, given that the cross-country analysis combines nations whose trends differ significantly from one another. As an example, a closer inspection of the OLS models reveals that France and Germany exhibit rather similar patterns and relationships between variables, whereas Italy is a story unto itself. The panel model, on the other hand, seeks to capture elements of similarity,

and hence, this contrast between the input data and the model's objectives leads to relatively modest R^2 values.

The results clearly demonstrate a sharp contrast and the diametrically opposite effect that inflation has on the bond and loan markets. Specifically, a 1% increase in the level of inflation causes a 4% surge in loan issues and a 9.7% contraction in bond issues. Additionally, the loan demand coefficients exhibit high levels of significance, indicating that an increase of one unit in loan demand results in a 0.5% increase in issued volumes but also a 0.8% decrease in bond issues. This suggests that when loan demand is high, the bond market cools, potentially indicating that many companies prefer to take out bank loans at the expense of other forms of debt financing.

These findings are in line with previous observations regarding the substitution effect of the two instruments. Indeed, in periods where the bank lending market is hindered by regulatory restrictions and requirements, the bond market prospers by necessity, while the opposite holds true in times when the banking market injects liquidity into companies, leading to a stalemate in debt financing on the public markets.

Moreover, the loan market proves to be highly responsive to Euribor levels, with a 1% increase in the reference interest rate resulting in a 1.5% contraction in loan issues. As previously discussed, bank loans are more closely tied to interest rates than bonds. While bonds are typically fixed-rate debt instruments that remain constant throughout the contractual period, bank loans are generally constructed with a markup of a series of points starting from the reference interest rates. Therefore, the monetary policy strategies adopted by central banks, particularly restrictive monetary policies, could have adverse effects on the bank debt market, leading to a downturn.

Ultimately, the trajectory of loan issuances appears to be intricately linked to the level of equity held on a company's balance sheet. Companies with high proportions of equity and consequently low leverage are more likely to seek financing through bank-issued loans. This phenomenon highlights the crucial role that equity plays in determining a company's funding preferences and underscores the significance of sound financial management. By prioritizing equity maintenance and judiciously managing leverage, firms can position themselves to access capital on favorable terms, ensuring long-term financial stability and success.

4.5 Exploratory data analysis. Impact of inflation on financial statements and business profitability: analysis of financial ratios and P&L items

In this chapter, we delve into the analysis of the balance sheet and income statement metrics of a cluster of companies hailing from the three countries under scrutiny. The dataset, which was sourced from Refinitiv, encompasses 1'646 firms spanning a diverse range of industries and sectors. The primary objective of this analysis is to juxtapose and scrutinize the evolution of these balance sheet and income statement figures before the onset of inflation and during a period of marked inflation.

To commence our analysis, we will first review three widely-used liquidity ratios that companies utilize, namely the current ratio, the quick ratio, and the cash ratio. The current ratio measures a company's current assets relative to its current liabilities, indicating its capacity to meet its short-term obligations. The quick ratio provides a more cautious assessment of a firm's liquidity. This ratio excludes inventory from the calculation of current assets because inventory can be arduous to convert into cash rapidly. Omitting inventory provides a more conservative estimate of a company's ability to fulfill its short-term financial obligations. Finally, the cash ratio is considered the most conservative of the three liquidity ratios, as it only considers cash and cash equivalents in current assets. By focusing exclusively on the most liquid assets, the cash ratio provides an accurate picture of a company's ability to settle its immediate liabilities with its accessible cash resources.

$$Current\ Ratio\ = \frac{Current\ Assets}{Current\ Liabilities}$$

$$Quick\ Ratio = \frac{Current\ Assets\ -\ Inventory}{Current\ Liabilities}$$

$$Cash\ Ratio = \frac{Cash\ and\ Cash\ Equivalents}{Current\ Liabilities}$$

Figure 24 Current Ratio, Quick Ratio and Cash Ratio Formula.

In recent years, the current ratio has shown an increase in the ability of most companies to meet short-term liabilities. However, it should be noted that this growth has been primarily driven by an expansion of inventory positions included in the current asset

portion. In contrast, the quick ratio and cash ratio indicate a decline in companies' ability to meet short-term obligations during the period of inflation. Specifically, the quick ratio has decreased by 10%, and the cash ratio has worsened by 6%. These results suggest that the challenging COVID-19 period and inflationary pressures have drained many companies' liquid resources, putting additional pressure on their ability to meet short-term financial obligations.

In terms of liquidity drainage, the operating expenses appear to have had minimal impact, as there were no notable spikes observed in comparison to previous periods. Specifically, these expenses are recognized as the disparity between the current period's operating expenses and those of the preceding period, as a percentage alteration on the previous period. The latest data indicates a positive variation for the 2021-2022 period, indicating an increase in fixed and variable expenses related to business operations, albeit not to the same extent as previously recorded peaks. The variation for the aforementioned period is 2%, whereas the average value for the years spanning 2003 to 2020 is 12.51%.

On the contrary, the value of inventories on the balance sheet has undergone a remarkable surge, increasing from an average of 5.8 million EUR during the pre-inflationary period to 29 million EUR during the inflationary period. This phenomenon is highly intriguing and could provide valuable insights into the procurement strategies of companies concerning raw materials and semi-finished products. It is likely that companies are stockpiling essential products for the production of goods to be sold on the final market due to the sluggish functioning of the business-to-business market and supply chains in the aftermath of the COVID-19 crisis, as well as the bottlenecks that have already surfaced.

In addition, the average turnover of these companies has also increased from 1.7 bn EUR during the pre-inflationary period to 2.7 bn EUR during the inflationary period. This rise in turnover suggests that demand has remained strong post-pandemic, particularly in sectors such as health care and social assistance, manufacturing, and those involved in the trade of utilities, logistics, and wholesale trade. An analysis of the cluster of companies indicates that these sectors have experienced a significant surge in turnover compared to others. Most companies have experienced an average turnover increase of

around 1 million EUR, with the exception of the utilities sector, which saw an extraordinary and record jump of around 7 million EUR.

Therefore, while demand remains high, the supply of input resources for companies remains slow and cumbersome. As a result, many companies have invested a substantial amount of capital in purchasing stocks. This strategic choice offers several advantages. First, it enables companies to meet demand promptly. Additionally, the presence of inventories allows companies to exercise greater internal control over the production and sale chain, ultimately benefiting the final market. However, in this new macroeconomic context, the Just in Time (JIT) model, which was widely applied in many supply chains, allowing companies to make warehouse costs and waste more efficient, has been partially questioned.

The JIT model was initially developed and implemented by Toyota in Japan in the 1950s and 1960s as part of its production system known as the Toyota Production System (TPS). The JIT model is a production strategy that aims to optimize inventory management and streamline production processes by producing and delivering goods and services only when they are required. This approach helps to reduce inventory costs, increase efficiency, and minimize waste. Nevertheless, implementing the JIT model can be challenging, as it requires a high level of coordination and communication among different stakeholders, and any disruptions to the supply chain can have significant impacts on production. Moreover, the JIT model may not be suitable for all industries or product types, as it relies heavily on accurate demand forecasting and may be less effective for products with long lead times or complex manufacturing processes. In this new context of inflationary pressures and supply chain slowdowns, the traditional model may be disrupted. In fact, firms may benefit from increasing their stock levels to optimize their margin gap, as prices are expected to continue to rise. By purchasing goods in the current period to be resold in the future at a higher price, companies can achieve a capital gain.

As demonstrated by other quantitative analyses conducted, companies appear to be absorbing more debt by increasing their leverage. Over the past two years, the average value of debt on EBITDA has increased significantly from 3.19 to 5.85, and the working capital has also seen a marked increase from an average of 122 million to 238 million.

These findings further support the results of the T-test, indicating that companies are taking on more debt, particularly to finance working capital and inventories.

The working capital represents a critical metric for companies, calculated as the difference between current assets and current liabilities. It is a measure of a company's ability to meet its short-term obligations, with current assets including cash, accounts receivable, inventory, and other assets expected to be converted into cash within a year, and current liabilities including accounts payable, accrued expenses, and other liabilities due within a year. A company with a strong working capital position has enough current assets to cover its current liabilities, indicating financial stability and their ability to meet obligations.

Therefore, the analysis of balance sheet ratios and income statement figures of these companies reveals a trend of increasing debt, a marked growth in turnover and inventory positions, a contraction in operating expenses, and lower liquidity rates.

Sector	Current ratio	Quick ratio	Cash ratio	Operating expenses	Revenue	Total Debt to EBITDA	Working Capital
Accommodation and Food Services	0.23	-0.01	-0.14	2.19	1'884'986'766.76	6.91	5'170'893.09
Administrative and Support and Waste Management Services	0.01	0.02	-0.17	0.44	720'586'421.14	50.42	-71'504'600.12
Agriculture, Forestry, Fishing and Hunting	0.18	0.06	0.10	0.41	353'121'487.22	2.98	137'141'900.77
Arts, Entertainment, and Recreation	1.38	1.30		0.47	213'508'646.54	5.01	-15'376'827.12
Construction	0.49	-0.14	0.25	0.44	3'010'223'047.95	2.95	71'822'117.25
Educational Services	0.79	0.07	-	0.22	2'367'300.00	3.48	1'721'905.17
Finance and Insurance	6.28	-4.96	-0.14	9.59	428'557'142.86	2.26	75'012'722.16
Health Care and Social Assistance	0.12	0.03		0.44	3'417'841'553.87	4.96	164'893'892.16
Information	-1.77	-1.47	0.04	2.13	1'466'156'186.00	4.04	20'703'425.62
Management of Companies and Enterprises	0.02	0.01		0.08	107'298'000.00	0.57	-13'207'244.18
Manufacturing	1.87	0.01	-0.03	0.94	3'336'271'127.24	3.46	428'618'780.32
Mining, Quarrying, and Oil and Gas Extraction	-0.23	0.43	-0.03	0.63	1'067'120'232.37	1.54	180'266'312.69
Other Services (except Public Administration)	0.18	0.30		0.26	929'348'250.00	1.52	-53'978'066.13
Professional, Scientific, and Technical Services	1.22	1.06	-0.33	0.31	982'426'053.88	3.07	185'437'832.06
Real Estate and Rental and Leasing	-0.09	0.06	0.21	10.00	269'593'368.06	22.50	6'826'863.75
Retail Trade	0.03	0.01	0.29	7.06	3'714'007'961.04	5.37	-86'060'876.65
Transportation and Warehousing	-0.24	0.04	-0.13	0.13	6'056'079'295.97	7.02	126'456'699.37
Utilities	10.32	-0.02	-0.03	0.41	17'209'454'673.47	4.58	673'530'590.98
Wholesale Trade	0.04	0.01	-	0.18	3'183'334'294.76	2.08	442'882'227.26
Total	1.214	-0.151	-0.077	2.032	2'767'401'361	5.848	238'420'874

Table 16 Summary table of financial ratios and income statement figures for a panel of companies obtained from Refinitiv. Years 2021-2022.

Sector	Current ratio	Quick ratio	Cash ratio	Operating expenses	Revenue	Total Debt to EBITDA	Working Capital
Accommodation and Food Services	-0.03	-0.01	0.04	-0.02	1'795'661'078.86	6.07	-41'999'619.06
Administrative and Support and Waste Management Services	0.01	0.01	-0.01	0.12	524'181'516.00	3.18	-59'509'860.47
Agriculture, Forestry, Fishing and Hunting	-0.02	-0.01	-0.01	0.13	260'490'195.95	2.42	88'136'545.62
Arts, Entertainment, and Recreation	0.01	0.02		0.14	112'114'331.02	2.60	-12'404'370.81
Construction	0.05	0.04	0.01	60.37	2'175'182'373.21	2.88	25'918'568.22
Educational Services	0.04	-0.00		0.30	753'335.29	0.25	15'259'338.26
Finance and Insurance	15.07	-0.13	0.04	0.57	193'490'239.69	4.65	-64'868'369.77
Health Care and Social Assistance	0.02	0.02		3.08	1'745'293'127.01	3.09	87'935'531.91
Information	0.12	0.01	-0.01	0.58	1'124'743'495.36	1.54	-81'765'267.55
Management of Companies and Enterprises	0.01	0.02		0.01	283'800'574.29	0.62	8'398'512.27
Manufacturing	-0.20	-0.01	0.02	18.76	2'049'139'771.83	2.81	241'091'007.00
Mining, Quarrying, and Oil and Gas Extraction	0.52	-0.09	-0.72	0.39	570'393'504.39	1.94	165'552'237.78
Other Services (except Public Administration)	0.02	-0.01		0.03	249'178'038.68	0.62	-37'386'202.88
Professional, Scientific, and Technical Services	-0.02	-0.01	0.04	0.56	649'863'933.96	2.02	73'505'779.95
Real Estate and Rental and Leasing	-2.97	0.03	-0.27	5.77	127'617'668.08	10.11	-16'064'854.14
Retail Trade	-0.00	0.00	-	0.14	2'709'491'070.15	5.00	-129'809'966.89
Transportation and Warehousing	-0.06	-0.11	0.02	0.08	3'694'996'989.47	2.77	524'946'790.27
Utilities	0.33	0.02	0.03	0.44	9'622'880'921.55	2.69	579'024'675.89
Wholesale Trade	-1.04	-1.14		66.63	2'072'352'215.81	3.06	196'455'121.54
Total	0.167	-0.049	-0.024	12.509	1'738'076'811	3.194	122'368'256

Table 17 Summary table of financial ratios and income statement figures for a panel of companies obtained from Refinitiv. Years 2003-2020.

5 CONCLUSION

To trace the compelling narrative of this work, it is evident that the results uncovered in this study challenge prevailing theories that suggest companies become risk-averse during periods of high inflation, opting to ration investment and expenses related to capital financing and debt. Instead, this study reveals a gripping plot of companies expanding their production activities and leveraging debt capital to a much greater extent than in pre-inflationary periods. In Germany and France, this scenario was particularly advantageous for loans, which experienced a remarkable resurgence. Meanwhile, in Italy, with the banking market already in sharp decline since 2011-2012, companies are forging alternative paths that have led to a boost in the corporate bond market. Here, the hand of the state played a crucial role, intervening by developing *ad hoc* regulations to open the bond market to SMEs, which form the bedrock of the Italian economic system. Among these regulations, a particularly successful and impactful one was the D.L. 22 June 2012, no. 83 ("Development Decree") relating to minibonds, which broke down entry barriers to the bond market for SMEs and, in parallel, stimulated investor interest with important tax incentives.

To truly comprehend the reasons behind companies' increased debt-taking amidst inflationary pressures, we must delve into the depths of the matter. It is undeniable that the pandemic has played a crucial role in fueling the current inflationary trend. With operating activities suspended across various sectors, a significant production delay relative to demand has accrued. Although this demand remained dormant in 2020 due to economic uncertainty and lockdowns, it exploded after restrictions were lifted, resulting in supply chain bottlenecks and a fierce determination on the part of companies to make up for lost time and respond to renewed demand. This is exemplified by the European GDP records relating to 2021-2022, which display peaks compared to past fluctuations, indicating a resurgence in consumption after years of pandemic-induced repression.

Furthermore, the BLS T-tests reveal that many companies are requesting loans from banks primarily to finance working capital and inventories, and in some cases, fixed investments. This indicates that many companies are expanding their production activities to keep pace with the resurging demand. The need to finance working capital could also be attributed to the aftermath of the liquidity crisis caused by the pandemic and the

increased cost of raw materials that has elevated operating costs. These factors exert a negative impact on the accounts payable balance sheet positions and contribute to eroding the working capital.

Furthermore, the need to finance inventories implies other crucial implications of the current context. Firms anticipating a continuous rise in prices would have a heightened interest in stockpiling, as the savings on raw material costs would outweigh the incremental costs of inventory and warehouse logistics. Moreover, stockpiling today and selling the goods tomorrow in an inflationary context with prices on the rise can help to increase the spread of margins and as mentioned in the introductory chapter, achieve a so-called inflation gain. These aspects increase the interest by companies, especially in the manufacturing sector, to increase inventories and semi-finished products on the balance sheet. Additionally, supply chain disruptions would make it extremely challenging, if not impossible, for companies to manage a JIT production model that requires substantial synchronization with upstream suppliers and downstream logistics.

Thus, the long-famed Japanese export model of JIT production may be relegated to the backburner in some cases, as companies pursue strategies that are more equipped to tackle the challenges posed by inflationary pressures. For companies, it would be a catastrophic blunder to fail to meet consumer demands due to inadequacies in their supply chains. Consequently, it is imperative that firms explore alternative models that prioritize stockpiling and inventory management to better navigate the ongoing inflationary climate.

This is particularly critical given the heightened cost of raw materials, which is likely to persist and exacerbate the already precarious working capital positions of firms. Therefore, the adoption of prudent inventory management strategies will not only ensure a reliable supply of inputs but also provide firms with a hedge against price fluctuations, allowing them to generate significant cost savings. In this regard, companies that can swiftly adapt and embrace these new models are better positioned to weather the current inflationary storm.

Compounded by the pandemic-induced depletion of internal cash reserves and earnings that have taken a relentless beating, the concomitant surge in working capital needs and inventory expenditures can no longer be funded through internal sources of financing or

retained earnings, but must instead rely on external funding sources, in particular debt finance.

Hence, despite the inflationary pressures that have prevailed over the past two years, the debt market has not undergone a meltdown as some experts had predicted. Rather, it has expanded, albeit with varying trends across different financial instruments such as bank loans and corporate bonds. The fixed effects panel model executed on France, Germany, and Italy demonstrates a strong correlation between inflation and loan-bond issuance volumes. Specifically, a one percentage point increase in inflation corresponds to a substantial 4% increase in bank loan issuance volume, but also a notable 9.7% contraction in bond issuance. These findings are indicative of the complex dynamics at play in the debt market, which require nuanced understanding and careful analysis.

In the current inflationary climate, there appears to be no indication of the trend that emerged in the aftermath of the subprime crisis, whereby corporate bonds were increasingly favored over bank loans, particularly in light of the stringent regulatory measures imposed on bank credit policies under the Basel III standard. On the contrary, there appears to be a subtle yet significant shift in the opposite direction, with the traditional loans issued through the banking channel regaining prominence. In fact, the inflationary pressures have spurred a revitalization of the bank lending market, resulting in a proliferation of new loan issuances.

Undoubtedly, a myriad of factors contributed to the notable rise in loan-taking, with one of the foremost being the cost disparity between bonds and bank loans. The continuous settling of bank prices below bond yields, as reported by the Bank of France provided an opportune moment for the loan market to proliferate, with the spreads on price differentials between loans and bonds slipping into negative territory. However, beyond the mere pricing aspect, other technical factors may have fueled the growth of loans. Firstly, their flexibility in debt repayment provided companies with the option to remain adaptable in times of inflation and rapidly changing demand, allowing them to repay the loan as soon as macroeconomic scenarios shift. Additionally, the speed of loan issuance, compared to bonds, could have played a significant role. The long-standing relationship between banks and companies made bank loans a more suitable instrument for firms dealing with sudden market evolutions and exogenous shocks triggered by the pandemic

and inflation. In contrast, corporate bonds typically necessitate a more protracted and convoluted issuance procedure due to the copious bureaucracy involved, the requisite approval required from pertinent institutions, and the lack of collateral or security which renders the transaction more precarious for the investor; thereby requiring a more exhaustive and meticulous scrutiny of overall risk.

These three intersecting factors, namely, affordability, repayment flexibility, and expedited issuance times may have played a critical role in reigniting the European bank lending market. The evidence suggests that the inflationary period did not result in a substitution trend of bonds over loans, as documented on multiple occasions since the monetary union and the subprime crisis. Instead, there has been a growth in the loan market at the expense of the bond market, particularly in France and Germany. Italy, on the other hand, is an exception due to the ongoing structural crisis in the banking sector since 2011. The previously observed substitution effect continues in Italy, with bonds being issued instead of loans. The veracity of this stance is affirmed by the OLS model analysis conducted. Specifically, in France and Germany, a 1% escalation in inflation is linked to a 9.9% and 3% surge in loan issues while simultaneously causing a 4.4% and 2% downturn in bond issues, respectively. In contrast, Italy experiences a reversal of fortunes, with a 1% rise in inflation corresponding to a 2% decline in loan issues, and a 3.5% uptick in bond issues. The evidence presented by this research demonstrates conclusively how inflation has engendered unforeseeable opportunities for companies, compelling them to redefine their operational and financial strategies accordingly.

6 CRITICAL APPRAISAL

The methodology adopted in this study is grounded in a rigorous and comprehensive analytical framework, which incorporates both quantitative and qualitative analytical techniques. In light of the fact that the study focuses on recent economic phenomena that have occurred over the past two years, there are significant challenges in terms of data availability and quality.

One critical challenge is that analyzing historical data can be problematic, as it may lead to insufficient sample sizes that render the statistical analysis less robust. To mitigate this risk and ensure that the analysis is based on a sufficient number of observations, the data analyzed in this study is predominantly sourced from macroeconomic variables, which are derived from a wide range of cross-sectional data sources, and mainly from monthly historical time-series data. By using this approach, the analyzed data encompasses a broad spectrum of observations and provides a comprehensive overview of macroeconomic trends across the countries under investigation.

In order to build on the present analysis and provide a more comprehensive understanding of the phenomena under investigation, it would be advantageous to delve further into the specific behaviors of companies operating across diverse sectors and industries. This would require a more detailed examination of the evidence found at a general and macroeconomic level, which could be achieved by studying the evolution of balance sheet ratios or profit and loss account quantities.

To gain a more nuanced understanding of the trends and dynamics at play in the European business landscape, it would be necessary to broaden the scope of investigation beyond France, Germany, and Italy and examine a wider range of European states. This would enable us to determine whether the phenomena observed can be extrapolated to a more general level across Europe and to identify any regional variations or anomalies.

Moreover, to conduct a thorough analysis, it would be worthwhile to focus on additional variables or aspects that were not given the same level of emphasis in this study. Specifically, a closer examination of tax and regulatory aspects, as well as the impact of raw material costs on the balance sheet and income statement ratios of businesses, could yield valuable insights.

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8 ANNEX

		lags	p-value (Italy)		p-value (France)		p-value (Germany)	
1	bond ~ equity	1	0.305		0.819		0.56	
2	bond ~ equity	2	0.327		0.048	**	0.03	**
3	bond ~ equity	3	0.455		0.052	*	0.014	**
4	equity ~ bond	1	0.835		0.012	**	0.192	
5	equity ~ bond	2	0.299		0.04	**	0.542	
6	equity ~ bond	3	0.493		0.138		0.02	**
7	bond ~ loan	1	0.021	**	0.359		0.332	
8	bond ~ loan	2	0.064	*	0.012	**	0.703	
9	bond ~ loan	3	0.104		0	***	0.52	
10	loan ~ bond	1	0.067	*	0.685		0.396	
11	loan ~ bond	2	0.041	**	0.036	**	0.739	
12	loan ~ bond	3	0.008	***	0.009	***	0.902	
13	equity ~ loan	1	0.795		0.685		0.795	
14	equity ~ loan	2	0.772		0.684		0.442	
15	equity ~ loan	3	0.755		0.04	**	0	***
16	loan ~ equity	1	0.792		0.314		0.254	
17	loan ~ equity	2	0.036	**	0.741		0.269	
18	loan ~ equity	3	0.024	**	0.462		0.022	**

Table 7 R Output. Granger causality test, cross-country output.

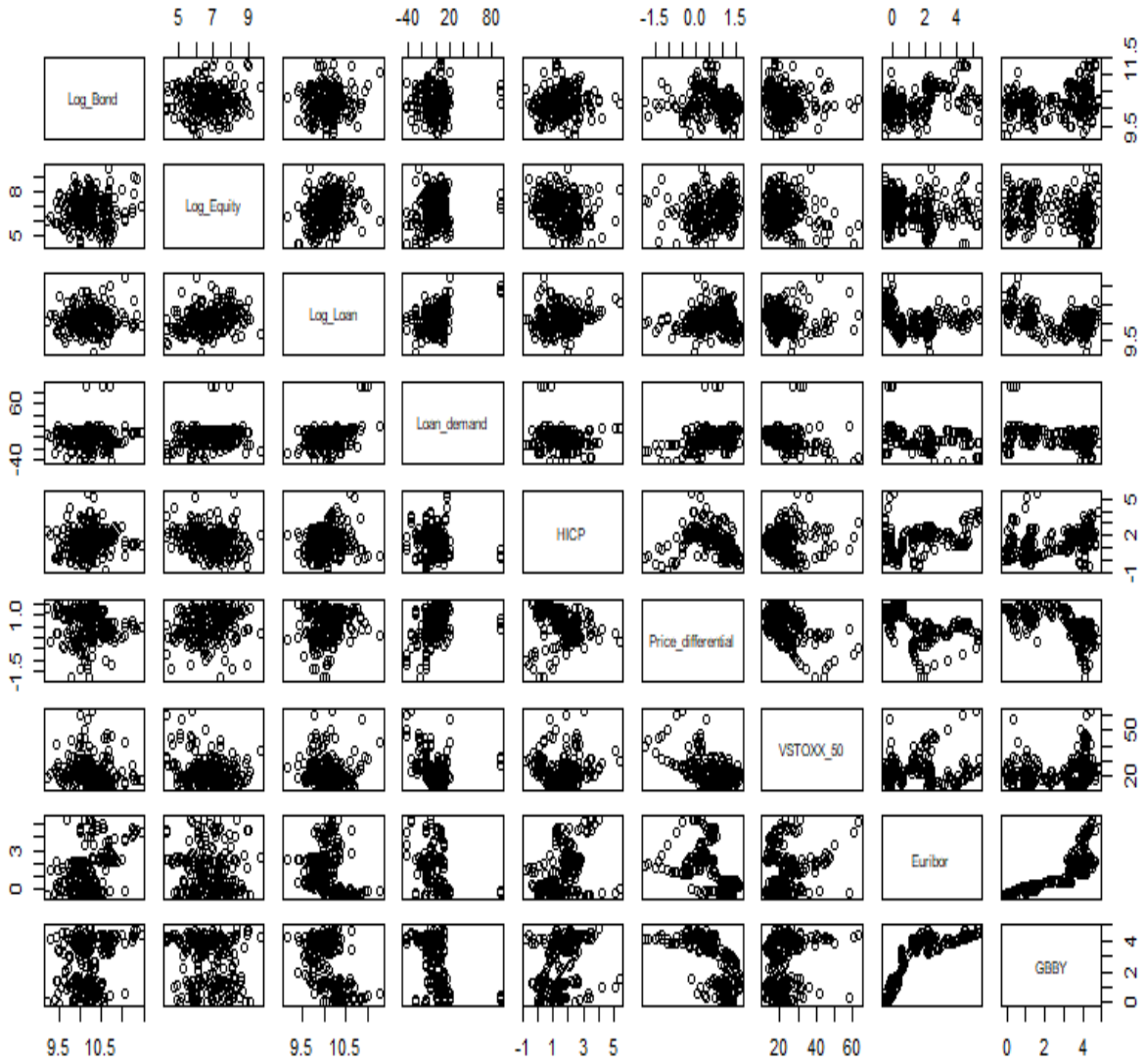

Figure 25 R Output. Correlation plot for the OLS model referred to France.

OLS France

	Dependent variable:	
	Log Loan	Log Bond
	(1)	(2)
Log Bond	0.134***	
	(0.051)	
Log Loan		0.225***
		(0.085)
Log Equity	0.074***	-0.006
	(0.018)	(0.024)
Loan_demand	0.006***	0.003*
	(0.001)	(0.002)
HICP	0.099***	-0.043*
	(0.019)	(0.026)
Price_differential	-0.028	-0.028
	(0.035)	(0.045)
VSTOXX_50	0.006**	-0.010***
	(0.002)	(0.003)
Euribor	-0.068***	0.141***
	(0.015)	(0.018)
Constant	8.035***	8.117***
	(0.542)	(0.828)
Observations	232	232
R^2	0.308	0.289
Adjusted R^2	0.286	0.267
Residual Std. Error (df = 224)	0.262	0.340
F Statistic (df = 7; 224)	14.230***	13.035***
Note:	*p<0.1; **p<0.05; ***p<0.01	

Table 8 R Output. OLS Model for France. (1) Shows the results for the equation with Log Loan as dependent variable and (2) shows the results for the equation with Log Bond as dependent variable. The estimations are provided for each dependent variable together with the standard errors, the latter reported in parenthesis.

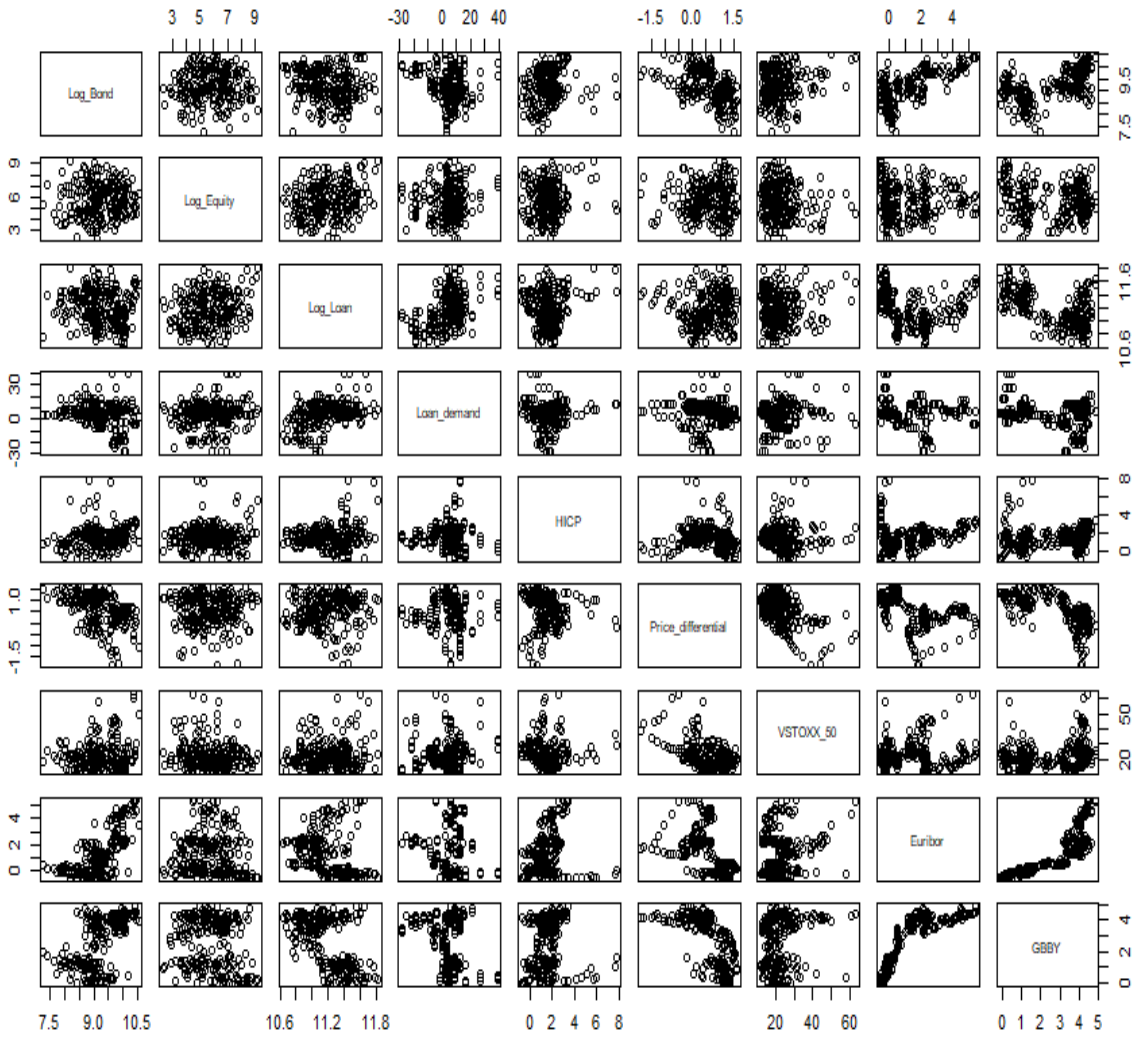

Figure 26 R Output. Correlation plot for the OLS model referred to Germany.

OLS Germany

	Dependent variable:	
	Log_Loan Estimate (1)	Log_Bond Std. Error (2)
Log_Bond	0.069**	
	(0.032)	
Log_Loan		0.298**
		(0.137)
Log_Equity	0.031***	0.015
	(0.010)	(0.021)
Loan_demand	0.009***	-0.011***
	(0.001)	(0.003)
HICP	0.030**	0.020
	(0.012)	(0.026)
Price_differential	0.041	-0.220***
	(0.029)	(0.059)
VSTOXX_50	0.005***	-0.006
	(0.002)	(0.004)
Euribor	-0.051***	0.250***
	(0.013)	(0.023)
Constant	10.211***	5.750***
	(0.299)	(1.501)
Observations	232	232
R^2	0.307	0.554
Adjusted R^2	0.286	0.540
Residual Std. Error (df = 224)	0.216	0.449
F Statistic (df = 7; 224)	14.198***	39.714***
Note:	*p<0.1; **p<0.05; ***p<0.01	

Table 9 R Output. OLS Model for Germany. (1) Shows the results for the equation with Log Loan as dependent variable and (2) shows the results for the equation with Log Bond as dependent variable. The estimations are provided for each dependent variable together with the standard errors, the latter reported in parenthesis.

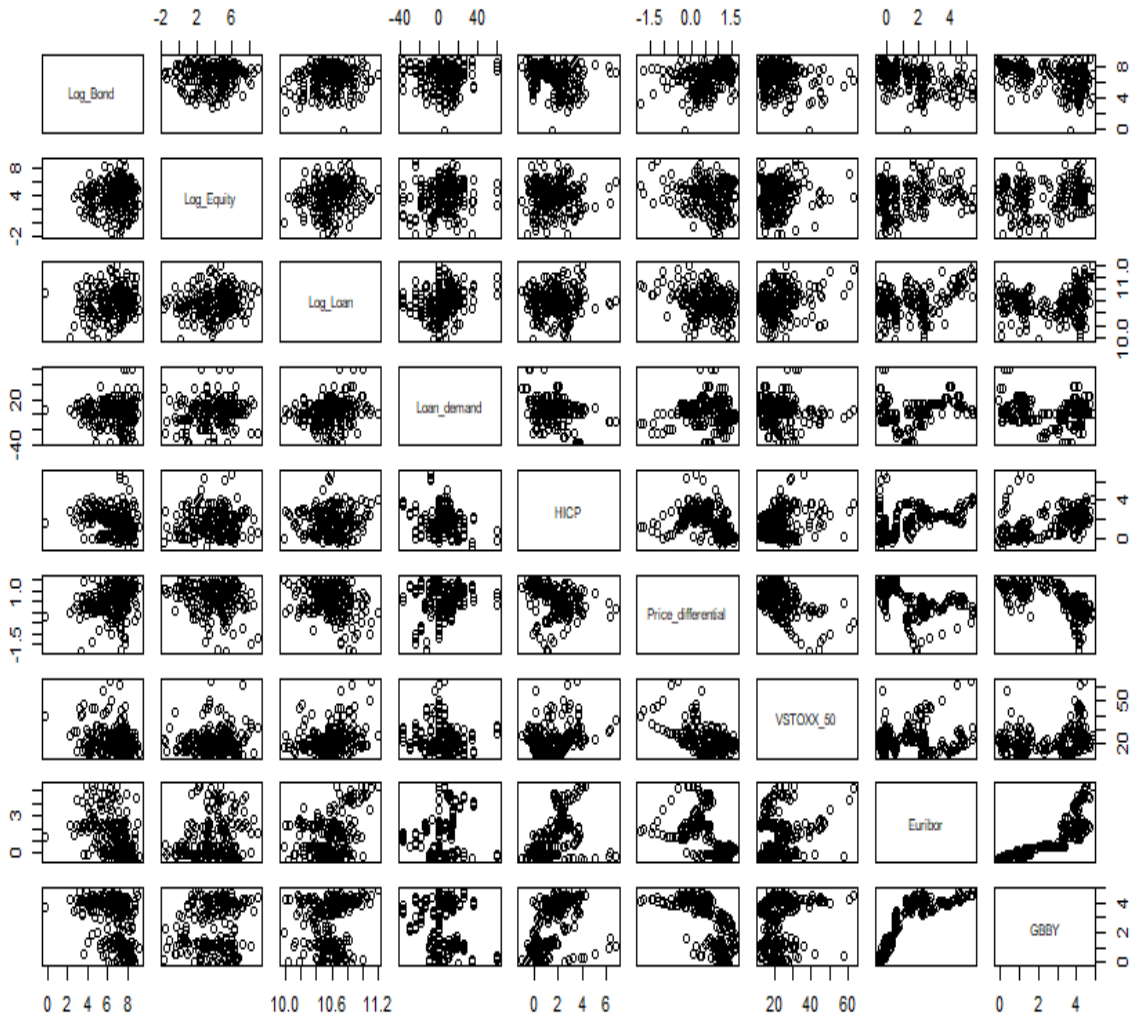

Figure 27 R Output. Correlation plot for the OLS model referred to Italy.

OLS Italy

	Dependent variable:	
	Log_Loan Estimate (1)	Log_Bond Std. Error (2)
Log_Bond	0.057***	
	(0.010)	
Log_Loan		2.434***
		(0.433)
Log_Equity	-0.002	0.090**
	(0.006)	(0.039)
Loan_demand	0.002***	-0.008
	(0.001)	(0.005)
HICP	-0.020*	0.035
	(0.011)	(0.073)
Price_differential	-0.042	0.240
	(0.025)	(0.166)
VSTOXX_50	0.004**	-0.016
	(0.002)	(0.012)
Euribor	0.068***	-0.496***
	(0.011)	(0.067)
Constant	10.087***	-18.579***
	(0.093)	(4.560)
Observations	204	204
R^2	0.340	0.361
Adjusted R^2	0.317	0.338
Residual Std. Error (df = 196)	0.176	1.154
F Statistic (df = 7; 196)	14.442***	15.791***
Note:	*p<0.1; **p<0.05; ***p<0.01	

Table 10 R Output. OLS Model for Italy. (1) Shows the results for the equation with Log Loan as dependent variable and (2) shows the results for the equation with Log Bond as dependent variable. The estimations are provided for each dependent variable together with the standard errors, the latter reported in parenthesis.

Panel Data Model Results

	Dependent Variable
	log_loan
lag(log_equity, 3)	0.009*
	(0.006)
lag(log_bond, 3)	-0.013
	(0.010)
lag(loan_demand, 3)	0.005***
	(0.001)
lag(hicp, 3)	0.040***
	(0.010)
lag(price_differential, 3)	0.022
	(0.019)
lag(vstoxx_50, 3)	0.001
	(0.001)
lag(euribor, 3)	-0.015*
	(0.008)
Observations	687
R^2	0.096
Adjusted R^2	0.084
F Statistic	10.236*** (df = 7; 677)
Note:	*p<0.1; **p<0.05; ***p<0.01

Table 11 R Output. Fixed effect panel model, Loan as dependent variable.

Panel Data Model Results

	Dependent Variable
	log_bond
lag(log_equity, 3)	-0.011
	(0.023)
lag(log_loan, 3)	0.016
	(0.158)
lag(loan_demand, 3)	-0.008***
	(0.003)
lag(hicp, 3)	-0.097**
	(0.041)
lag(price_differential, 3)	0.081
	(0.076)
lag(vstoxx_50, 3)	-0.001
	(0.005)
lag(euribor, 3)	0.032
	(0.031)
Observations	687
R^2	0.020
Adjusted R^2	0.007
F Statistic	2.006* (df = 7; 677)
Note:	*p<0.1; **p<0.05; ***p<0.01

Table 12 R Output. Fixed effect panel model, Bond as dependent variable.

```
> # * Monthly ----------------------------------------------------------------
> data_panel_ym <- pdata.frame(data_ym, index = c("country", "date"))
> fe_mod_ym <- plm(f_mod,       data = data_panel_ym, model = "within")
> summary(fe_mod_ym)
Oneway (individual) effect Within Model

Call:
plm(formula = f_mod, data = data_panel_ym, model = "within")

Balanced Panel: n = 3, T = 229, N = 687

Residuals:
     Min.   1st Qu.    Median   3rd Qu.      Max.
-6.700801 -0.378444  0.038652  0.587876  2.581126

Coefficients:
                           Estimate Std. Error t-value Pr(>|t|)
lag(log_equity, 3)        -0.0108112  0.0226909 -0.4765 0.633904
lag(log_loan, 3)           0.0156106  0.1584858  0.0985 0.921566
lag(loan_demand, 3)       -0.0080842  0.0028368 -2.8497 0.004509 **
lag(hicp, 3)              -0.0971981  0.0413843 -2.3487 0.019127 *
lag(price_differential, 3) 0.0811058  0.0763490  1.0623 0.288477
lag(vstoxx_50, 3)         -0.0014700  0.0051661 -0.2845 0.776078
lag(euribor, 3)            0.0318000  0.0313938  1.0129 0.311452
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Total Sum of Squares:    684.63
Residual Sum of Squares: 670.72
R-Squared:      0.020322
Adj. R-Squared: 0.0072983
F-statistic: 2.00621 on 7 and 677 DF, p-value: 0.05206
```

Figure 28 R Output. Panel model with fixed effect, Bond.

```
> # * Monthly ----------------------------------------------------------------
> data_panel_ym <- pdata.frame(data_ym, index = c("country", "date"))
> fe_mod_ym <- plm(f_mod,       data = data_panel_ym, model = "within")
> summary(fe_mod_ym)
Oneway (individual) effect Within Model

Call:
plm(formula = f_mod, data = data_panel_ym, model = "within")

Balanced Panel: n = 3, T = 229, N = 687

Residuals:
     Min.   1st Qu.    Median   3rd Qu.      Max.
-0.809996 -0.161993 -0.012756  0.165150  1.146945

Coefficients:
                            Estimate  Std. Error t-value  Pr(>|t|)
lag(log_equity, 3)          0.00949427  0.00570361  1.6646 0.0964536 .
lag(log_bond, 3)           -0.01321235  0.00975671 -1.3542 0.1761306
lag(loan_demand, 3)         0.00462636  0.00067651  6.8386 1.789e-11 ***
lag(hicp, 3)                0.03967710  0.01041227  3.8106 0.0001512 ***
lag(price_differential, 3)  0.02165824  0.01928021  1.1233 0.2616910
lag(vstoxx_50, 3)           0.00132730  0.00130090  1.0203 0.3079548
lag(euribor, 3)            -0.01459546  0.00788362 -1.8514 0.0645522 .
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Total Sum of Squares:    47.338
Residual Sum of Squares: 42.807
R-Squared:      0.095709
Adj. R-Squared: 0.083687
F-statistic: 10.2361 on 7 and 677 DF, p-value: 3.1697e-12
```

Figure 29 R Output. Panel model with fixed effect, Loan.

```
> t.test(Q71_before_inflation, Q71_after_inflation)

        Welch Two Sample t-test

data:  Q71_before_inflation and Q71_after_inflation
t = 0.62991, df = 53.003, p-value = 0.5315
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 -1.971817  3.777373
sample estimates:
mean of x mean of y
 5.347222  4.444444
```

Figure 30 R Output. T test France, question on the impact of debt refinancing, restructuring, renegotiation.

```
> t.test(Q72_before_inflation, Q72_after_inflation)

        Welch Two Sample t-test

data:  Q72_before_inflation and Q72_after_inflation
t = -2.9141, df = 13.04, p-value = 0.01204
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 -19.345836  -2.876386
sample estimates:
  mean of x   mean of y
-10.6666667   0.4444444
```

Figure 31 R Output. T test France, question on the impact of fixed investment.

```
> t.test(Q73_before_inflation, Q73_after_inflation)

        Welch Two Sample t-test

data:  Q73_before_inflation and Q73_after_inflation
t = -2.6021, df = 11.984, p-value = 0.02316
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 -14.776225  -1.307109
sample estimates:
 mean of x  mean of y
-0.5972222  7.4444444
```

Figure 32 R Output. T test France, question on the impact of inventories and working capital.

```
> t.test(Q74_before_inflation, Q74_after_inflation)

        Welch Two Sample t-test

data:  Q74_before_inflation and Q74_after_inflation
t = -0.81485, df = 14.291, p-value = 0.4285
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 -11.737747   5.265525
sample estimates:
mean of x mean of y
 2.430556  5.666667
```

Figure 33 R Output. T test France, question on the impact of mergers and acquisitions and corporate restructuring.

```
> t.test(Q75_before_inflation, Q75_after_inflation)

        Welch Two Sample t-test

data:  Q75_before_inflation and Q75_after_inflation
t = -1.536, df = 11.093, p-value = 0.1526
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 -19.41835   3.44613
sample estimates:
mean of x mean of y
-1.986111  6.000000
```

Figure 34 R Output. T test France, question on demand for loans.

```
> t.test(Q71_before_inflation, Q71_after_inflation)

        Welch Two Sample t-test

data:  Q71_before_inflation and Q71_after_inflation
t = 2.773, df = 16.931, p-value = 0.01306
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 0.7698543 5.6745902
sample estimates:
mean of x mean of y
 6.222222  3.000000
```

Figure 35 R Output. T test Germany, question on the impact of debt refinancing, restructuring, renegotiation.

```
> t.test(Q72_before_inflation, Q72_after_inflation)

        Welch Two Sample t-test

data:  Q72_before_inflation and Q72_after_inflation
t = 0.69163, df = 14.724, p-value = 0.4999
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 -5.217033 10.217033
sample estimates:
mean of x mean of y
-1.055556 -3.555556
```

Figure 36 R Output. T test Germany, question on the impact of fixed investment.

```
> t.test(Q73_before_inflation, Q73_after_inflation)

        Welch Two Sample t-test

data:  Q73_before_inflation and Q73_after_inflation
t = -1.7903, df = 10.485, p-value = 0.1023
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 -12.240366   1.295922
sample estimates:
mean of x mean of y
 3.638889  9.111111
```

Figure 37 R Output. T test Germany, question on the impact of inventories and working capital.

```
> t.test(Q74_before_inflation, Q74_after_inflation)

        Welch Two Sample t-test

data:  Q74_before_inflation and Q74_after_inflation
t = 0.61867, df = 17.342, p-value = 0.5442
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 -1.837237  3.365015
sample estimates:
  mean of x   mean of y
-0.01388889 -0.77777778
```

Figure 38 R Output. T test Germany, question on the impact of mergers and acquisitions and corporate restructuring.

```
> t.test(Q75_before_inflation, Q75_after_inflation)

        Welch Two Sample t-test

data:  Q75_before_inflation and Q75_after_inflation
t = 0.067358, df = 11.033, p-value = 0.9475
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 -7.476170  7.948392
sample estimates:
mean of x mean of y
 3.569444  3.333333
```

Figure 39 R Output. T test Germany, Question on demand for loans.

```
> t.test(Q71_before_inflation, Q71_after_inflation)

        Welch Two Sample t-test

data:  Q71_before_inflation and Q71_after_inflation
t = 2.3187, df = 9.6693, p-value = 0.0437
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
  0.4057473 23.0664749
sample estimates:
mean of x mean of y
15.847222  4.111111
```

Figure 40 R Output. T test Italy, question on the impact of debt refinancing, restructuring, renegotiation.

```
> t.test(Q72_before_inflation, Q72_after_inflation)

        Welch Two Sample t-test

data:  Q72_before_inflation and Q72_after_inflation
t = -0.3895, df = 17.721, p-value = 0.7015
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 -8.79999  6.04999
sample estimates:
mean of x mean of y
-4.819444 -3.444444
```

Figure 41 R Output. T test Italy, question on the impact of fixed investment.

```
> t.test(Q73_before_inflation, Q73_after_inflation)

        Welch Two Sample t-test

data:  Q73_before_inflation and Q73_after_inflation
t = -1.2304, df = 10.402, p-value = 0.2456
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 -16.302911   4.664022
sample estimates:
mean of x mean of y
 7.291667 13.111111
```

Figure 42 T test Italy, question on the impact of inventories and working capital.

```
> t.test(Q74_before_inflation, Q74_after_inflation)

        Welch Two Sample t-test

data:  Q74_before_inflation and Q74_after_inflation
t = -0.017267, df = 60.457, p-value = 0.9863
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 -3.245139  3.189584
sample estimates:
mean of x mean of y
-1.694444 -1.666667
```

Figure 43 R Output. T test Italy, question on the impact of mergers and acquisitions and corporate restructuring.

```
> t.test(Q75_before_inflation, Q75_after_inflation)

        Welch Two Sample t-test

data:  Q75_before_inflation and Q75_after_inflation
t = -0.15336, df = 17.47, p-value = 0.8799
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 -7.568980  6.541202
sample estimates:
mean of x mean of y
 3.263889  3.777778
```

Figure 44 R Output. T test Italy, question on demand for loans.

```
> Fit_France_1 <- lm(Log_Loan ~ Log_Bond + Log_Equity + Loan_demand + HICP + Price_differential + VSTOXX_50 + Euribor,
+                    data = OLS_France)
> summary(Fit_France_1)

Call:
lm(formula = Log_Loan ~ Log_Bond + Log_Equity + Loan_demand +
    HICP + Price_differential + VSTOXX_50 + Euribor, data = OLS_France)

Residuals:
     Min       1Q   Median       3Q      Max
-0.73029 -0.15476  0.00139  0.15055  0.88790

Coefficients:
                   Estimate Std. Error t value Pr(>|t|)
(Intercept)        8.034756   0.541611  14.835  < 2e-16 ***
Log_Bond           0.133873   0.050713   2.640  0.00888 **
Log_Equity         0.074388   0.017528   4.244 3.22e-05 ***
Loan_demand        0.006249   0.001148   5.444 1.36e-07 ***
HICP               0.099041   0.018878   5.246 3.59e-07 ***
Price_differential -0.028094   0.034867  -0.806  0.42124
VSTOXX_50          0.005702   0.002421   2.355  0.01937 *
Euribor           -0.068267   0.015071  -4.530 9.60e-06 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.2617 on 224 degrees of freedom
Multiple R-squared:  0.3078,    Adjusted R-squared:  0.2862
F-statistic: 14.23 on 7 and 224 DF,  p-value: 2.924e-15
```

Figure 45 R Output. OLS France, Loan as dependent variable.

```
> Fit_France_2 <- lm(Log_Bond ~ Log_Loan + Log_Equity + Loan_demand + HICP + Price_differential + VSTOXX_50 + Euribor,
+                    data = OLS_France)
> summary(Fit_France_2)

Call:
lm(formula = Log_Bond ~ Log_Loan + Log_Equity + Loan_demand +
    HICP + Price_differential + VSTOXX_50 + Euribor, data = OLS_France)

Residuals:
     Min       1Q   Median       3Q      Max
-1.00036 -0.19424  0.02513  0.21679  0.81930

Coefficients:
                   Estimate Std. Error t value Pr(>|t|)
(Intercept)        8.116879   0.827576   9.808  < 2e-16 ***
Log_Loan           0.225370   0.085374   2.640  0.00888 **
Log_Equity        -0.006026   0.023636  -0.255  0.79898
Loan_demand        0.002846   0.001573   1.809  0.07176 .
HICP              -0.042874   0.025797  -1.662  0.09791 .
Price_differential -0.028423   0.045264  -0.628  0.53069
VSTOXX_50         -0.009715   0.003113  -3.121  0.00204 **
Euribor            0.140587   0.018142   7.749 3.19e-13 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.3396 on 224 degrees of freedom
Multiple R-squared:  0.2894,    Adjusted R-squared:  0.2672
F-statistic: 13.04 on 7 and 224 DF,  p-value: 4.732e-14
```

Figure 46 R Output. OLS France, Bond as dependent variable.

```
> cor_france <- cor(ols_France)
> cor_france
                    Log_Bond  Log_Equity    Log_Loan Loan_demand       HICP Price_differential   VSTOXX_50    Euribor       GBBY
Log_Bond          1.00000000  0.04366426  0.09043521  0.08519096  0.1298453        -0.1420044 -0.12597459  0.4318497  0.2863298
Log_Equity        0.04366426  1.00000000  0.24290734  0.18573011 -0.2274505         0.1833211 -0.23788930 -0.1294635 -0.1816902
Log_Loan          0.09043521  0.24290734  1.00000000  0.38599539  0.1206626         0.1113916 -0.05232771 -0.2140233 -0.4623246
Loan_demand       0.08519096  0.18573011  0.38599539  1.00000000 -0.1432674         0.3717709 -0.31359413 -0.2944178 -0.4103998
HICP              0.12984532 -0.22745053  0.12066263 -0.14326738  1.0000000        -0.2256307  0.03742410  0.4071240  0.3366657
Price_differential -0.14200440  0.18332111  0.11139156  0.37177092 -0.2256307         1.0000000 -0.51764206 -0.5157228 -0.6892244
VSTOXX_50         -0.12597459 -0.23788930 -0.05232771 -0.31359413  0.0374241        -0.5176421  1.00000000  0.1971408  0.2406614
Euribor           0.43184969 -0.12946346 -0.21402333 -0.29441782  0.4071240        -0.5157228  0.19714084  1.0000000  0.8454023
GBBY              0.28632984 -0.18169019 -0.46232456 -0.41039977  0.3366657        -0.6892244  0.24066139  0.8454023  1.0000000
```

Figure 47 R Output. Correlation matrix OLS France Model 1 and 2.

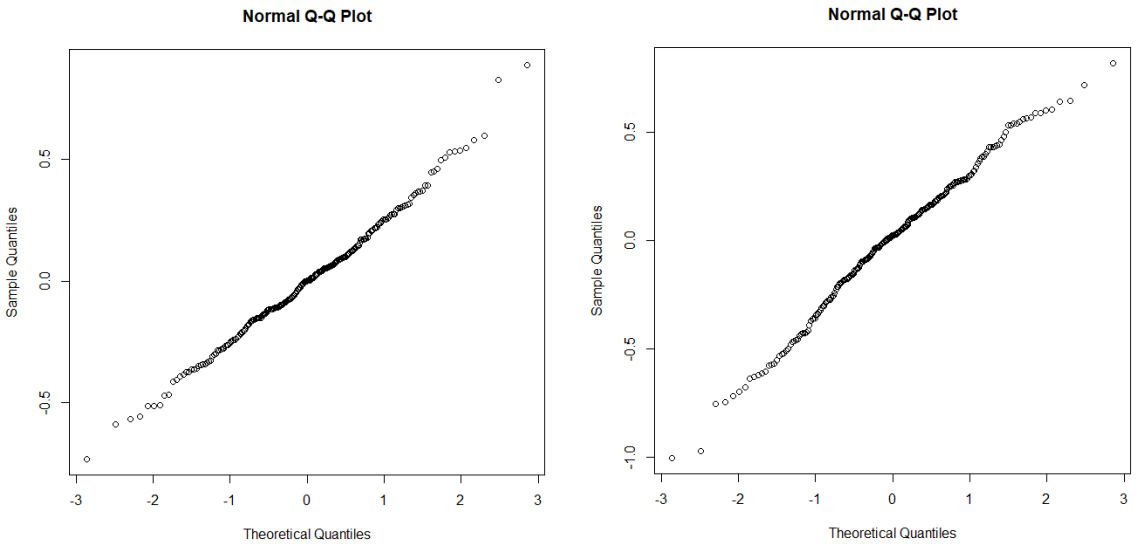

Figure 48 R Output. QQ-plot chart to visualize the normality of the residuals for OLS France (Model 1 on the left side and Model 2 on the right side).

```
        Shapiro-Wilk normality test

data:  Fit_France_1$residuals
W = 0.99308, p-value = 0.3544
```

Figure 49 R Output. Shapiro-Wilk normality test for OLS France Model 1.

```
        Shapiro-Wilk normality test

data:  Fit_France_2$residuals
W = 0.99108, p-value = 0.1681
```

Figure 50 R Output. Shapiro-Wilk normality test for OLS France Model 2.

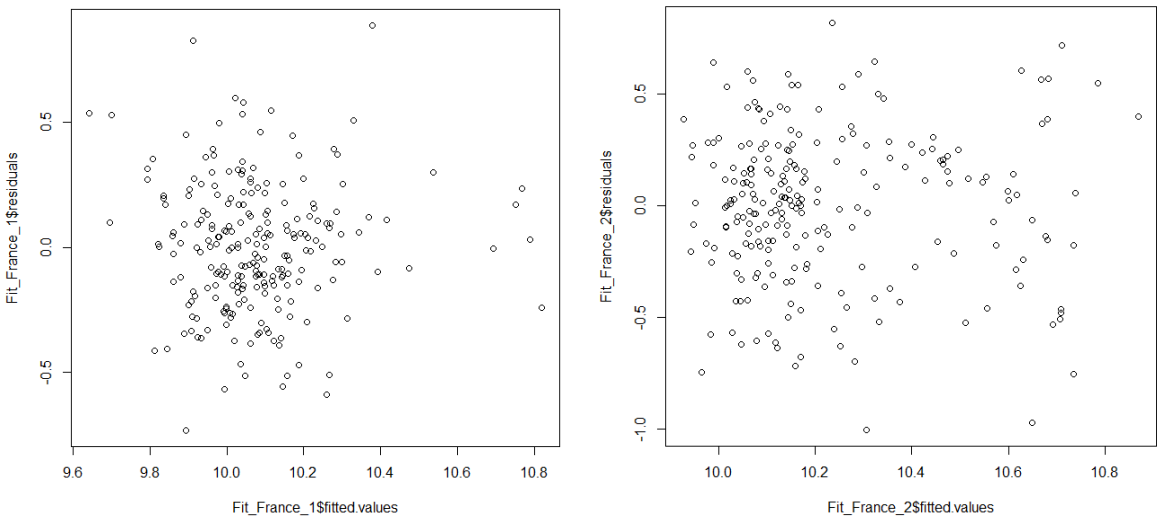

Figure 51 Residuals vs fitted values plot to visualize the homoscedasticity of the residuals for OLS France. (Model 1 on the left side and Model 2 on the right side).

```
> bptest(Fit_France_1)

        studentized Breusch-Pagan test

data:  Fit_France_1
BP = 9.7808, df = 7, p-value = 0.2013
```

Figure 52 R Output. Breusch-Pagan test for heteroscedasticity for OLS France, Model 1.

```
> bptest(Fit_France_2)

        studentized Breusch-Pagan test

data:  Fit_France_2
BP = 15.621, df = 7, p-value = 0.02881
```

Figure 53 Output. Breusch-Pagan test for heteroscedasticity for OLS France, Model 2.

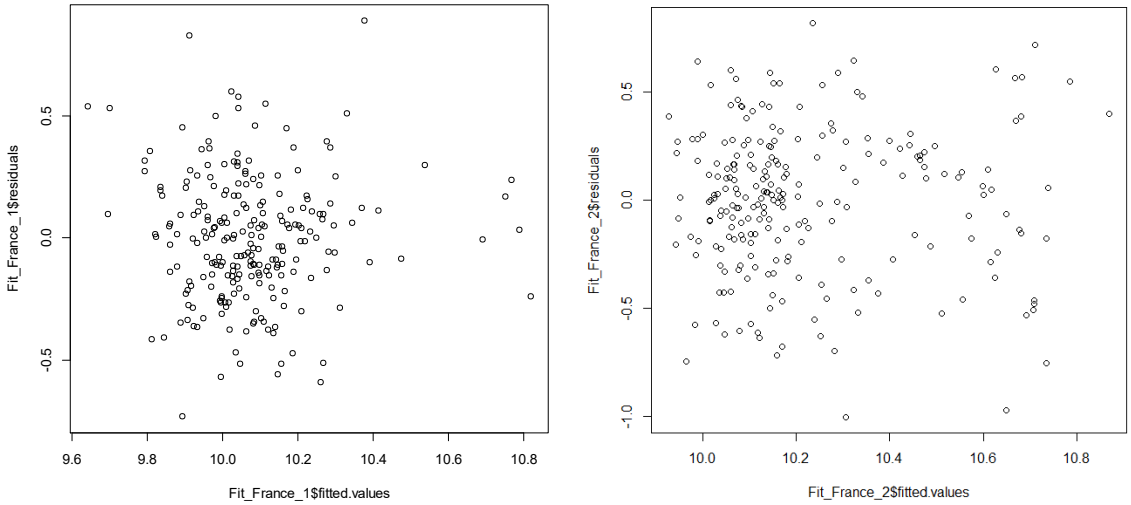

Figure 54 R Output. Residuals vs fitted values plot to visualize linearity for OLS France. (Model 1 on the left side and Model 2 on the right side).

```
> anova(Fit_France_1)
Analysis of Variance Table

Response: Log_Loan
                    Df  Sum Sq Mean Sq F value    Pr(>F)
Log_Bond             1  0.1813 0.18127  2.6467 0.1051741
Log_Equity           1  1.2680 1.26799 18.5138 2.520e-05 ***
Loan_demand          1  2.5878 2.58777 37.7837 3.582e-09 ***
HICP                 1  1.0047 1.00473 14.6699 0.0001663 ***
Price_differential   1  0.0069 0.00691  0.1008 0.7511115
VSTOXX_50            1  0.3682 0.36818  5.3758 0.0213196 *
Euribor              1  1.4053 1.40534 20.5191 9.599e-06 ***
Residuals          224 15.3415 0.06849
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

Figure 55 R Output. Analysis of variance (ANOVA) for OLS France, Model 1.

```
> anova(Fit_France_2)
Analysis of Variance Table

Response: Log_Bond
                    Df  Sum Sq Mean Sq F value    Pr(>F)
Log_Loan             1  0.2973  0.2973  2.5782 0.1097509
Log_Equity           1  0.0182  0.0182  0.1577 0.6916531
Loan_demand          1  0.1001  0.1001  0.8685 0.3523850
HICP                 1  0.7421  0.7421  6.4360 0.0118633 *
Price_differential   1  1.0333  1.0333  8.9616 0.0030666 **
VSTOXX_50            1  1.4058  1.4058 12.1926 0.0005779 ***
Euribor              1  6.9237  6.9237 60.0504 3.194e-13 ***
Residuals          224 25.8268  0.1153
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

Figure 56 R Output. Analysis of variance (ANOVA) for OLS France, Model 2.

```
> Fit_Germany_1 <- lm(Log_Loan ~ Log_Bond + Log_Equity + Loan_demand + HICP + Price_differential + VSTOXX_50 + Euribor,
+                    data = ols_Germany)
> summary(Fit_Germany_1)

Call:
lm(formula = Log_Loan ~ Log_Bond + Log_Equity + Loan_demand +
    HICP + Price_differential + VSTOXX_50 + Euribor, data = ols_Germany)

Residuals:
     Min       1Q   Median       3Q      Max
-0.47362 -0.16408 -0.01966  0.16440  0.57653

Coefficients:
                   Estimate Std. Error t value Pr(>|t|)
(Intercept)       10.211260   0.299144  34.135  < 2e-16 ***
Log_Bond           0.069032   0.031802   2.171 0.031008 *
Log_Equity         0.030787   0.009895   3.111 0.002104 **
Loan_demand        0.009290   0.001374   6.760 1.18e-10 ***
HICP               0.030372   0.012339   2.461 0.014598 *
Price_differential 0.041141   0.029262   1.406 0.161133
VSTOXX_50          0.005207   0.001940   2.685 0.007806 **
Euribor           -0.050762   0.013245  -3.833 0.000165 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.2159 on 224 degrees of freedom
Multiple R-squared:  0.3073,    Adjusted R-squared:  0.2857
F-statistic:  14.2 on 7 and 224 DF,  p-value: 3.149e-15
```

Figure 57 R Output. OLS Germany, Loan as dependent variable.

```
> Fit_Germany_2 <- lm(Log_Bond ~ Log_Loan + Log_Equity + Loan_demand + HICP + Price_differential + VSTOXX_50 + Euribor,
+                    data = ols_Germany)
> summary(Fit_Germany_2)

Call:
lm(formula = Log_Bond ~ Log_Loan + Log_Equity + Loan_demand +
    HICP + Price_differential + VSTOXX_50 + Euribor, data = ols_Germany)

Residuals:
     Min       1Q   Median       3Q      Max
-1.49093 -0.25227  0.04416  0.27591  1.61174

Coefficients:
                   Estimate Std. Error t value Pr(>|t|)
(Intercept)        5.749970   1.500537   3.832 0.000165 ***
Log_Loan           0.298432   0.137484   2.171 0.031008 *
Log_Equity         0.014673   0.020991   0.699 0.485263
Loan_demand       -0.011304   0.003043  -3.715 0.000257 ***
HICP               0.020305   0.025965   0.782 0.435040
Price_differential -0.219869   0.059318  -3.707 0.000265 ***
VSTOXX_50         -0.006164   0.004077  -1.512 0.131962
Euribor            0.249718   0.023015  10.850  < 2e-16 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.4489 on 224 degrees of freedom
Multiple R-squared:  0.5538,    Adjusted R-squared:  0.5398
F-statistic: 39.71 on 7 and 224 DF,  p-value: < 2.2e-16
```

Figure 58 R Output. OLS Germany, Bond as dependent variable.

```
> cor_Germany <- cor(ols_Germany)
> cor_Germany
                    Log_Bond  Log_Equity    Log_Loan  Loan_demand        HICP Price_differential    VSTOXX_50     Euribor        GBBY
Log_Bond          1.00000000  0.02010805 -0.12952272 -0.221709994  0.18100128       -0.47867940  0.14186133  0.70534059  0.59584108
Log_Equity        0.02010805  1.00000000  0.22908282  0.099921459  0.11332009        0.03667576 -0.15254121 -0.04811216 -0.14623108
Log_Loan         -0.12952272  0.22908282  1.00000000  0.429774815  0.12240784        0.08759895  0.07874727 -0.25103933 -0.52976057
Loan_demand      -0.22170999  0.09992146  0.42977482  1.000000000  0.00636205        -0.01943688  0.07129153 -0.14676771 -0.27444427
HICP              0.18100128  0.11332009  0.12240784  0.006362055  1.00000000       -0.03690219 -0.05366603  0.19119628  0.08871943
Price_differential -0.47867940  0.03667576  0.08759895 -0.019436883 -0.03690219        1.00000000 -0.51764206 -0.51572279 -0.68922441
VSTOXX_50         0.14186133 -0.15254121  0.07874727  0.071291529 -0.05366603       -0.51764206  1.00000000  0.19714084  0.24066139
Euribor           0.70534059 -0.04811216 -0.25103933 -0.146767705  0.19119628       -0.51572279  0.19714084  1.00000000  0.84540226
GBBY              0.59584108 -0.14623108 -0.52976057 -0.274444273  0.08871943       -0.68922441  0.24066139  0.84540226  1.00000000
```

Figure 59 R Output. Correlation matrix OLS Germany Model 1 and 2.

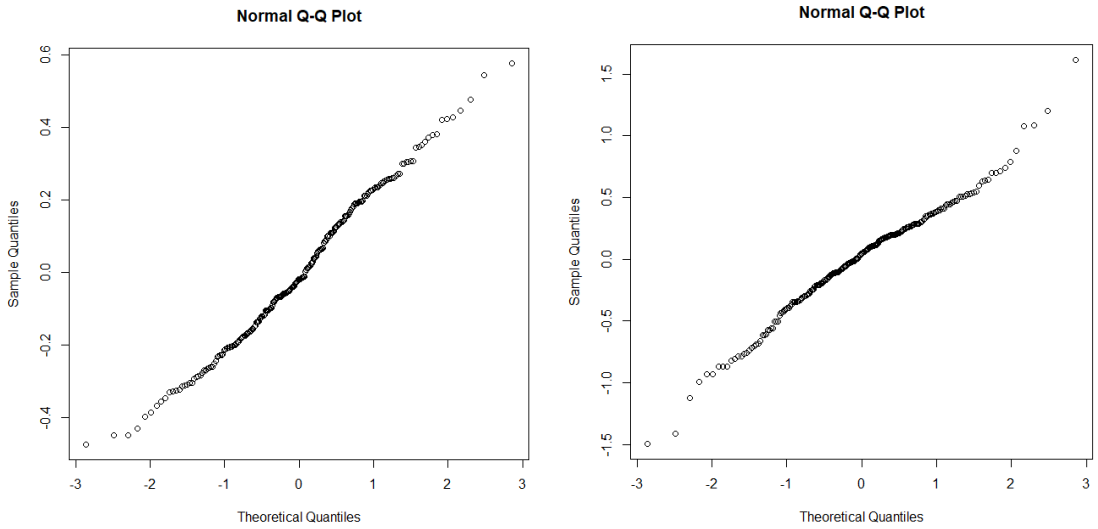

Figure 60 R Output. QQ-plot chart to visualize the normality of the residuals for OLS Germany (Model 1 on the left side and Model 2 on the right side).

```
> shapiro.test(Fit_Germany_1$residuals)

        Shapiro-Wilk normality test

data:  Fit_Germany_1$residuals
W = 0.9901, p-value = 0.1143
```

Figure 61 R Output. Shapiro-Wilk normality test for OLS Germany, Model 1.

```
> shapiro.test(Fit_Germany_2$residuals)

        Shapiro-Wilk normality test

data:  Fit_Germany_2$residuals
W = 0.98212, p-value = 0.005019
```

Figure 62 R Output. Shapiro-Wilk normality test for OLS Germany, Model 2.

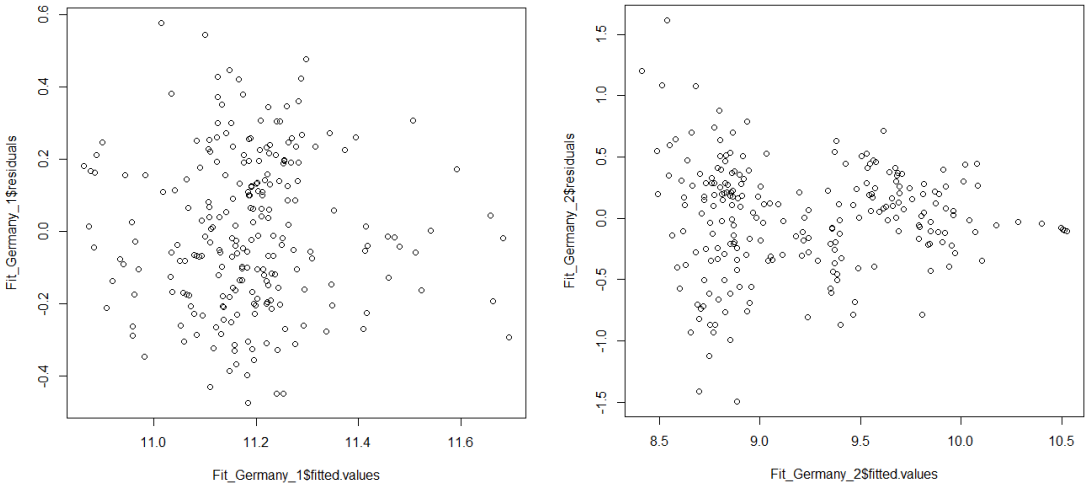

Figure 63 Residuals vs fitted values plot to visualize the homoscedasticity of the residuals for OLS Germany. (Model 1 on the left side and Model 2 on the right side).

```
> bptest(Fit_Germany_1)

        studentized Breusch-Pagan test

data:  Fit_Germany_1
BP = 5.2918, df = 7, p-value = 0.6244
```

Figure 64 R Output. Breusch-Pagan test for heteroscedasticity for OLS Germany, Model 1.

```
> bptest(Fit_Germany_2)

        studentized Breusch-Pagan test

data:  Fit_Germany_2
BP = 46.551, df = 7, p-value = 6.829e-08
```

Figure 65 R Output. Breusch-Pagan test for heteroscedasticity for OLS Germany, Model 2.

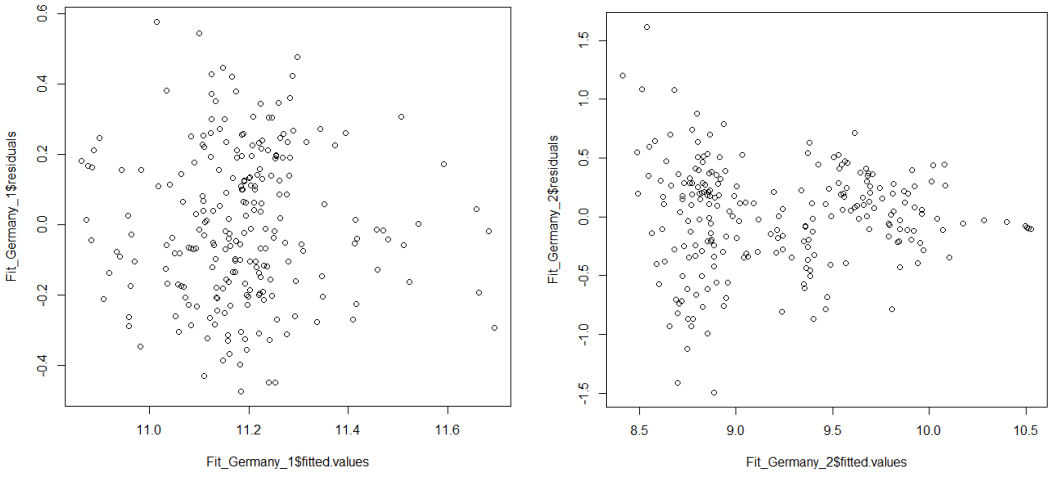

Figure 66 R Output. Residuals vs fitted values plot to visualize linearity for OLS Germany. (Model 1 on the left side and Model 2 on the right side).

```
> dwtest(Fit_Germany_2)

        Durbin-Watson test

data:  Fit_Germany_2
DW = 0.95637, p-value < 2.2e-16
alternative hypothesis: true autocorrelation is greater than 0
```

Figure 67 R Output. Test of Durbin-Watson for autocorrelation for OLS Germany, Model 2.

```
> anova(Fit_Germany_1)
Analysis of Variance Table

Response: Log_Loan
                    Df  Sum Sq Mean Sq F value    Pr(>F)
Log_Bond             1  0.2529 0.25290  5.4251 0.0207394 *
Log_Equity           1  0.8096 0.80955 17.3660 4.404e-05 ***
Loan_demand          1  2.2779 2.27790 48.8640 3.113e-11 ***
HICP                 1  0.1789 0.17885  3.8366 0.0513859 .
Price_differential   1  0.0765 0.07654  1.6419 0.2013957
VSTOXX_50            1  0.3525 0.35252  7.5621 0.0064478 **
Euribor              1  0.6848 0.68476 14.6891 0.0001647 ***
Residuals          224 10.4422 0.04662
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

Figure 68 R Output. Analysis of variance (ANOVA) for OLS Germany, Model 1.

```
> anova(Fit_Germany_2)
Analysis of Variance Table

Response: Log_Bond
                    Df Sum Sq Mean Sq  F value    Pr(>F)
Log_Loan             1  1.697  1.6972   8.4215  0.004078 **
Log_Equity           1  0.265  0.2646   1.3128  0.253104
Loan_demand          1  3.424  3.4243  16.9918 5.288e-05 ***
HICP                 1  3.473  3.4731  17.2337 4.698e-05 ***
Price_differential   1 22.684 22.6844 112.5611 < 2.2e-16 ***
VSTOXX_50            1  0.755  0.7553   3.7478  0.054135 .
Euribor              1 23.725 23.7254 117.7268 < 2.2e-16 ***
Residuals          224 45.143  0.2015
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

Figure 69 R Output. Analysis of variance (ANOVA) for OLS Germany, Model 2.

```
> Fit_Italy_1 <- lm(Log_Loan ~ Log_Bond + Log_Equity + Loan_demand + HICP + Price_differential + VSTOXX_50 + Euribor,
+                   data = ols_Italy)
> summary(Fit_Italy_1)

Call:
lm(formula = Log_Loan ~ Log_Bond + Log_Equity + Loan_demand +
    HICP + Price_differential + VSTOXX_50 + Euribor, data = ols_Italy)

Residuals:
     Min       1Q   Median       3Q      Max
-0.53996 -0.08684  0.01241  0.13213  0.33984

Coefficients:
                   Estimate Std. Error t value Pr(>|t|)
(Intercept)       10.086688   0.093124 108.315  < 2e-16 ***
Log_Bond           0.056944   0.010140   5.616 6.63e-08 ***
Log_Equity        -0.001588   0.006108  -0.260  0.79515
Loan_demand        0.002385   0.000811   2.940  0.00367 **
HICP              -0.020499   0.011015  -1.861  0.06423 .
Price_differential -0.041819   0.025335  -1.651  0.10042
VSTOXX_50          0.003806   0.001781   2.137  0.03383 *
Euribor            0.067659   0.010578   6.396 1.15e-09 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.1765 on 196 degrees of freedom
  (28 Beobachtungen als fehlend gelöscht)
Multiple R-squared:  0.3403,    Adjusted R-squared:  0.3167
F-statistic: 14.44 on 7 and 196 DF,  p-value: 4.207e-15
```

Figure 70 R Output. OLS Germany, Loan as dependent variable.

```
> Fit_Italy_2 <- lm(Log_Bond ~ Log_Loan + Log_Equity + Loan_demand + HICP + Price_differential + VSTOXX_50 + Euribor,
+                   data = ols_Italy)
> summary(Fit_Italy_2)

Call:
lm(formula = Log_Bond ~ Log_Loan + Log_Equity + Loan_demand +
    HICP + Price_differential + VSTOXX_50 + Euribor, data = ols_Italy)

Residuals:
    Min      1Q  Median      3Q     Max
-3.2724 -0.6983  0.0978  0.7597  2.8053

Coefficients:
                   Estimate Std. Error t value Pr(>|t|)
(Intercept)       -18.579341   4.560449  -4.074 6.71e-05 ***
Log_Loan            2.434051   0.433425   5.616 6.63e-08 ***
Log_Equity          0.089677   0.039422   2.275    0.024 *
Loan_demand        -0.007719   0.005390  -1.432    0.154
HICP                0.035439   0.072603   0.488    0.626
Price_differential  0.240073   0.165904   1.447    0.149
VSTOXX_50          -0.016435   0.011719  -1.402    0.162
Euribor            -0.496335   0.067266  -7.379 4.43e-12 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.154 on 196 degrees of freedom
  (28 Beobachtungen als fehlend gelöscht)
Multiple R-squared:  0.3606,    Adjusted R-squared:  0.3378
F-statistic: 15.79 on 7 and 196 DF,  p-value: 2.259e-16
```

Figure 71 R Output. OLS Germany, Bond as dependent variable.

```
> cor_Italy <- cor(ols_Italy)
> plot(ols_Italy)
> cor_Italy
```

	Log_Bond	Log_Equity	Log_Loan	Loan_demand	HICP	Price_differential	VSTOXX_50	Euribor	GBBY
Log_Bond	1.0000000	NA	0.12195169	-0.03381220	-0.25788043	0.2941799	-0.18335450	-0.44987730	-0.4286597
Log_Equity	NA	1	NA	NA	NA	NA	NA	NA	NA
Log_Loan	0.1219517	NA	1.00000000	0.20366158	0.02804751	-0.2669417	0.23528606	0.34249527	0.1399729
Loan_demand	-0.0338122	NA	0.20366158	1.00000000	-0.24365347	0.1050791	-0.08889297	0.07249449	-0.1741719
HICP	-0.2578804	NA	0.02804751	-0.24365347	1.00000000	-0.3658614	0.18662061	0.49921027	0.4917532
Price_differential	0.2941799	NA	-0.26694172	0.10507913	-0.36586142	1.0000000	-0.51764206	-0.51572279	-0.6892244
VSTOXX_50	-0.1833545	NA	0.23528606	-0.08889297	0.18662061	-0.5176421	1.00000000	0.19714084	0.2406614
Euribor	-0.4498773	NA	0.34249527	0.07249449	0.49921027	-0.5157228	0.19714084	1.00000000	0.8454023
GBBY	-0.4286597	NA	0.13997288	-0.17417192	0.49175316	-0.6892244	0.24066139	0.84540226	1.0000000

Figure 72 R Output. Correlation matrix OLS Italy Model 1 and 2.

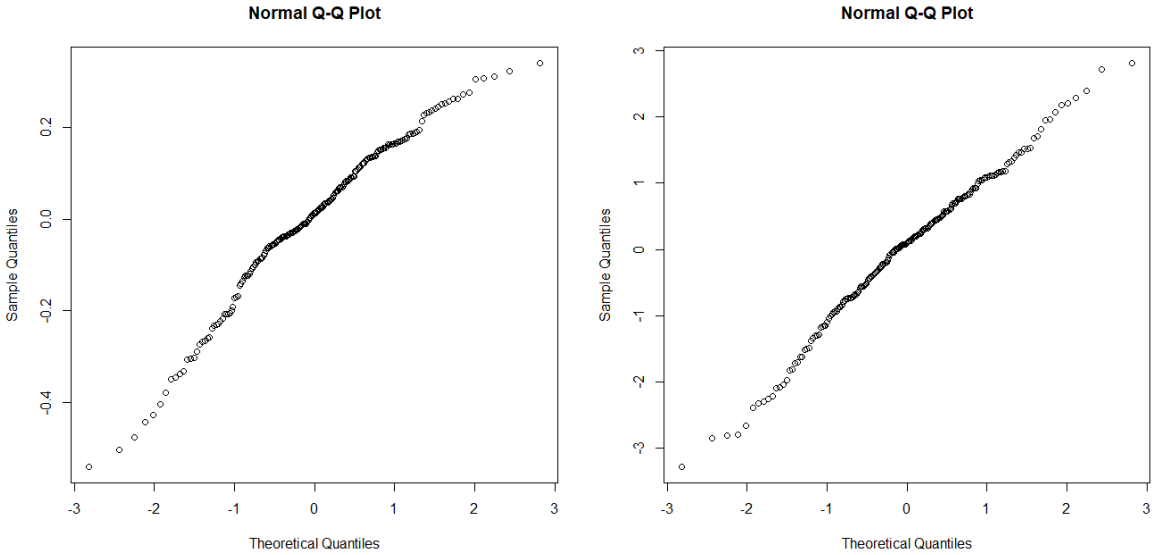

Figure 73 R Output. QQ-plot chart to visualize the normality of the residuals for OLS Italy (Model 1 on the left side and Model 2 on the right side).

```
> shapiro.test(Fit_Italy_1$residuals)

        Shapiro-Wilk normality test

data:  Fit_Italy_1$residuals
W = 0.97065, p-value = 0.0002901
```

Figure 74 R Output. Shapiro-Wilk normality test for OLS Germany, Model 1.

```
        Shapiro-Wilk normality test

data:  Fit_Italy_2$residuals
W = 0.98875, p-value = 0.109
```

Figure 75 R Output. Shapiro-Wilk normality test for OLS Germany, Model 2.

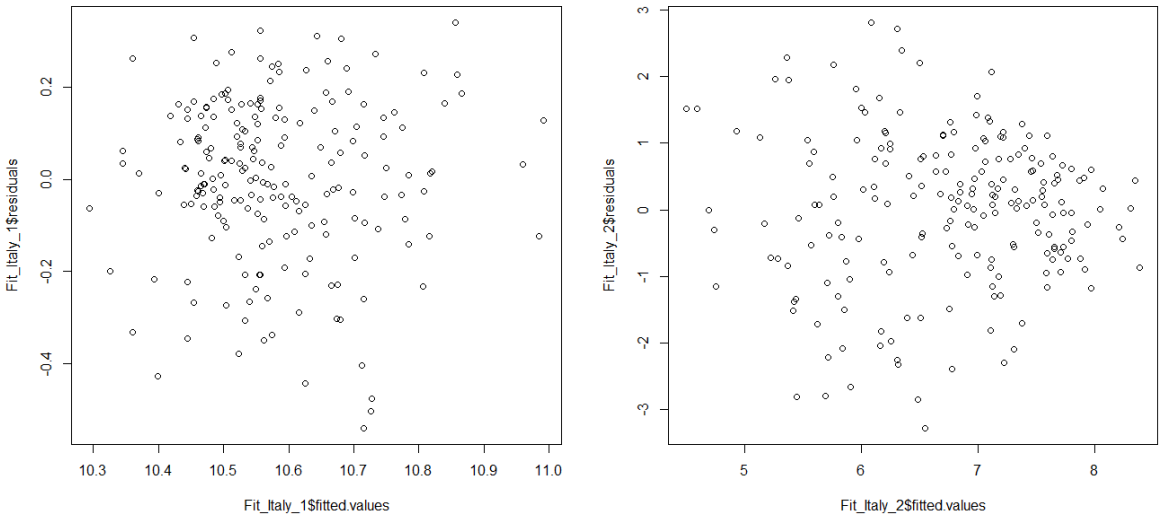

Figure 76 Residuals vs fitted values plot to visualize the homoscedasticity of the residuals for OLS Italy. (Model 1 on the left side and Model 2 on the right side).

```
> bptest(Fit_Italy_1)

        studentized Breusch-Pagan test

data:  Fit_Italy_1
BP = 19.31, df = 7, p-value = 0.00727
```

Figure 77 R Output. Breusch-Pagan test for heteroscedasticity for OLS Italy, Model 1.

```
> bptest(Fit_Italy_2)

        studentized Breusch-Pagan test

data:  Fit_Italy_2
BP = 21.242, df = 7, p-value = 0.003428
```

Figure 78 R Output. Breusch-Pagan test for heteroscedasticity for OLS Italy, Model 2.

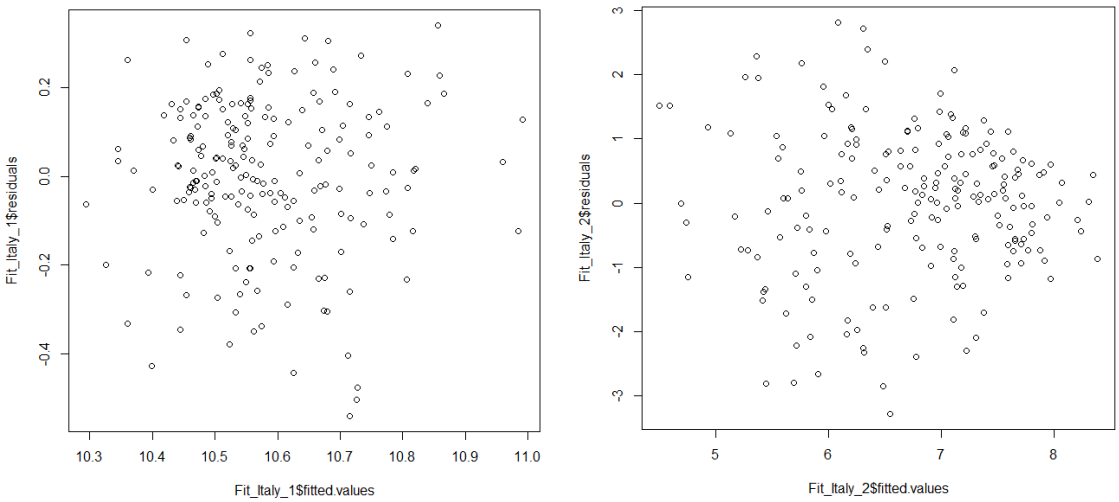

Figure 79 Output. Residuals vs fitted values plot to visualize linearity for OLS Italy. (Model 1 on the left side and Model 2 on the right side).

```
> anova(Fit_Italy_1)
Analysis of Variance Table

Response: Log_Loan
                    Df Sum Sq Mean Sq F value    Pr(>F)
Log_Bond             1 0.0753 0.07529  2.4173  0.121618
Log_Equity           1 0.2110 0.21105  6.7761  0.009945 **
Loan_demand          1 0.3758 0.37579 12.0658  0.000632 ***
HICP                 1 0.1578 0.15779  5.0663  0.025506 *
Price_differential   1 0.9733 0.97327 31.2492 7.536e-08 ***
VSTOXX_50            1 0.0814 0.08138  2.6130  0.107602
Euribor              1 1.2741 1.27409 40.9077 1.146e-09 ***
Residuals          196 6.1045 0.03115
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Figure 80 R Output. Analysis of variance (ANOVA) for OLS Italy, Model 1.

```
> anova(Fit_Italy_2)
Analysis of Variance Table

Response: Log_Bond
                    Df  Sum Sq Mean Sq F value    Pr(>F)
Log_Loan             1   3.320   3.320  2.4941    0.1159
Log_Equity           1   0.484   0.484  0.3637    0.5471
Loan_demand          1   0.939   0.939  0.7056    0.4019
HICP                 1  32.965  32.965 24.7619 1.416e-06 ***
Price_differential   1  36.400  36.400 27.3413 4.355e-07 ***
VSTOXX_50            1   0.562   0.562  0.4224    0.5165
Euribor              1  72.482  72.482 54.4446 4.430e-12 ***
Residuals          196 260.935   1.331
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Figure 81 R Output. Analysis of variance (ANOVA) for OLS Italy, Model 2.

Code/Variable	Description	Unit	Frequency	Source	Full description- Original Dataset	Dataset's Name
Bond	Gross issue of debt securities by NFCs	Million EUR	Monthly	ECB	Gross issues of debt securities by NFCs in France- Gross issues against cash (flows), Securities other than shares, excluding financial derivatives, Nominal Value, NFCs (ESA 95 classification), issuing sector, all currencies combined, denominated in EUR	SEC.M.FR.1100.F33000.N.2.Z01.E.Z SEC.M.IT.1100.F33000.N.2.Z01.E.Z SEC.M.DE.1100.F33000.N.2.Z01.E.Z
Equity	Gross issues of listed shares by NFCs	Million EUR	Monthly	ECB	(Gross) issues against cash (flows), Listed shares, ESA95 valuation, NFCs, (ESA 95 classification) issuing sector, all currencies combined, denominated in EUR	SEC.M.FR.1100.F51100.M.2.Z01.E.Z SEC.M.IT.1100.F51100.M.2.Z01.E.Z SEC.M.DE.1100.F51100.M.2.Z01.E.Z
Loan	Bank business volumes - loans to corporations (new business and renegotiation)	Million EUR	Monthly	ECB	Business volume (outstanding amount / new business), Credit and other institutions (MFI except MMFs and central banks) reporting sector - Loans other than revolving loans and overdrafts, convenience and extended credit card debt, Total initial rate fixation, new business and renegotiation coverage, up to and including 1 million and more than one million, NFCs (S.11) sector, denominated in EUR	MIR.M.FR.B.A2A.A.B.0.2240.EUR.N MIR.M.FR.B.A2A.A.B.1.2240.EUR.N MIR.M.FR.B.A2A.A.B.0.2240.EUR.R MIR.M.FR.B.A2A.A.B.1.2240.EUR.R MIR.M.IT.B.A2A.A.B.0.2240.EUR.N MIR.M.IT.B.A2A.A.B.1.2240.EUR.N MIR.M.IT.B.A2A.A.B.0.2240.EUR.R MIR.M.IT.B.A2A.A.B.1.2240.EUR.R MIR.M.DE.B.A2A.A.B.0.2240.EUR.N MIR.M.DE.B.A2A.A.B.1.2240.EUR.N MIR.M.DE.B.A2A.A.B.0.2240.EUR.R MIR.M.DE.B.A2A.A.B.1.2240.EUR.R

Table 13 Data and variables selection for the Granger Causality Test. Data retrieved from the ECB data warehouse.

Code/Variable	Description	Unit	Frequency	Source	Full description- Original Dataset	Dataset's Name
Log Bond	Natural logarithm of gross issue of debt securities by NFCs	Million EUR	Monthly	ECB	Gross issues of debt securities by non-financial corporations - gross issues against cash (flows), securities other than shares, excluding financial derivatives, nominal value, NFCs (ESA 95 classification), issuing sector, all currencies combined, denominated in EUR	SEC.M.FR.1100.F33000.N.2.Z01.E.Z SEC.M.IT.1100.F33000.N.2.Z01.E.Z SEC.M.DE.1100.F33000.N.2.Z01.E.Z
Log Equity	Natural logarithm of gross issues of listed shares by NFCs	Million EUR	Monthly	ECB	Gross issues against cash (flows), listed shares, ESA95 valuation, NFCs, (ESA 95 classification) issuing sector, all currencies combined, denominated in EUR	SEC.M.FR.1100.F51100.M.2.Z01.E.Z SEC.M.IT.1100.F51100.M.2.Z01.E.Z SEC.M.DE.1100.F51100.M.2.Z01.E.Z
Log Loan	Natural logarithm of bank business volumes - loans to corporations (new business and renegotiation)	Million EUR	Monthly	ECB	Business volume (outstanding amount / new business), credit and other institutions (MFI except MMFs and central banks) reporting sector - loans other than revolving loans and overdrafts, convenience and extended credit card debt, Total initial rate fixation, new business, and renegotiation coverage, up to and including 1 million/more than one million, NFCs (S.11) sector, denominated in EUR	MIR.M.FR.B.A2A.A.B.0.2240.EUR.N MIR.M.FR.B.A2A.A.B.1.2240.EUR.N MIR.M.FR.B.A2A.A.B.0.2240.EUR.R MIR.M.FR.B.A2A.A.B.1.2240.EUR.R MIR.M.IT.B.A2A.A.B.0.2240.EUR.N MIR.M.IT.B.A2A.A.B.1.2240.EUR.N MIR.M.IT.B.A2A.A.B.0.2240.EUR.R MIR.M.IT.B.A2A.A.B.1.2240.EUR.R MIR.M.DE.B.A2A.A.B.0.2240.EUR.N MIR.M.DE.B.A2A.A.B.1.2240.EUR.N MIR.M.DE.B.A2A.A.B.0.2240.EUR.R MIR.M.DE.B.A2A.A.B.1.2240.EUR.R
Loan demand	Loan demand country-Question 6 of the BLS	Percentage	Quarterly - Transformed into Monthly	ECB	Overall-Enterprise - All banks - Question on Overall - contract counterpart Enterprise - Backward looking three months - Loan demand - Diffusion index	BLS.Q.FR.ALL.O.E.Z.B3.ZZ.D.DINX
HICP	Harmonized Index Consumer Price	Percentage	Monthly	ECB	HICP - Overall index - France - HICP - Overall index, Annual rate of change, Eurostat, neither seasonally nor working day adjusted	ICP.M.FR.N.000000.4.ANR ICP.M.IT.N.000000.4.ANR ICP.M.DE.N.000000.4.ANR

Price differential	Spread as difference between Cost of Borrowing Loan for Corporations in Europe and Yields for Euro Corporations	Percentage	Monthly	ECB and Bloomberg	Cost of borrowing for corporations-Euro area (changing composition), Annualized agreed rate (AAR) Total calculated by weighting the volumes with a moving average (defined for cost of borrowing purposes), New business coverage, NFCs (S.11) sector, denominated in EUR. ERXS Index provided by Bloomberg - Yield to Worst (Conventional) refers to a measure used to measure the total return of a portfolio of "conventional" bonds (i.e., not high-yield or "junk bonds") over a given period. In particular, the "Yield to Worst" is an indicator that considers the yield of the bond if it is repaid early. This is important because many bonds include prepayment provisions, which can reduce the overall return of the portfolio if not considered.	MIR.M.U2.B.A2I.AM.R.A.2240.EUR.N Bloomberg
VSTOXX_50	The EURO STOXX 50 Volatility index (VSTOXX)	Percentage	Monthly	STOXX	Volatility index of the EURO STOXX 50, Europe's leading blue-chip stock index by industry	EURO STOXX 50® Volatility (VSTOXX®) - Qontigo
EURIBOR	Euribor 1 year-historical close, average of observations through the period	Percentage	Monthly	ECB	Euribor 1-year - Historical close, average of observations through period - Euro area (changing composition) - Money Market - Euribor 1-year - Historical close, average of observations through period - Euro	FM.M.U2.EUR.RT.MM.EURIBOR1YD.HSTA
GBBY	Euro Area - 10-year Government Benchmark Bond Yield	Percentage	Monthly	ECB	Euro area 10-year Government Benchmark bond yield - Yield -Euro area (changing composition) - Benchmark bond - Euro area 10-year Government Benchmark bond yield - Yield - EUR	FM.M.U2.EUR.4F.BB.U2_10Y.YLD

Table 14 Data and variables selection for the OLS Model. Data retrieved from the ECB data warehouse and Bloomberg.