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Course of Financial Statement Analysis

Does the Covid-19 crisis change the effect of financing on investment for SMEs?

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Abstract

This paper examines the effect of the Covid-19 pandemic on firms financing and investment. By investigating 1804 SMEs in the retail and wholesale industry and 682 SMEs in the construction industry across five European countries, the study documents no significant change in investment across the sample periods. However, the findings revealed that the crisis has a decisive impact on the relationship the financing sources have on investment. External financing showed a significant increase in effect size on firms' investment during the crisis period with an easing effect in the post-crisis period. Internal finance, on the other hand, exhibited contrasting effects, displaying less significance during the crisis period while becoming more determinant for firms' investment in the pre-and post-crisis period. Contrary to conventional economic theories, these results suggest that SMEs rely heavily on external financing during economic shocks, while internal financing explains investment during economic equilibrium.

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Table of Content

1.0 Introduction

In the OECD area, SMEs account for 99% of all enterprises and are responsible for 60% of value-added. They often contribute significantly to urban identity and social solidarity of local communities and are a thriving factor for economic development (OECD, 2019). SMEs serve as a foundation for job creation (Ayyagari, Demirgüç-Kunt & Maksimovic, 2011 and Birch, 1987) with two-thirds of employees in the OECD area working for SMEs (OECD, 2019). Moreover, they foster entrepreneurship as well as facilitate innovation (Block, Colombo, Cumming & Vismara, 2018 and Dutta & Folta, 2016) and are flexible to adapt to today's rapidly changing market conditions. Yet, these social and economic benefits can only materialize if small businesses survive and prosper. The Covid-19 pandemic and the subsequent shock to the economy was unprecedented both in its complexity and severity. Global lockdowns and changes in consumer behavior caused by fear of the coronavirus have not only disrupted the supply side of the economy but also led to the biggest collapse in consumer demand since the Great Depression. The gravity of the recession and the prevailing uncertainty about the recovery raised concerns that many small companies would not survive the crisis.

As SMEs have inherently fewer human, financial and capital resources than larger companies they are regarded to be most vulnerable to economic shocks. (Verbano & Venturini, 2013). This susceptibility was particularly evident during and after the global financial crisis of 2007/08 when SMEs experienced both a sharp fall in demand and many companies ran into financial difficulties. Their lower resilience means that SMEs are hit harder during a crisis and suffer longer from its consequences. Data from the ECB and the European Commission (EC) revealed that the financial crisis was accompanied by a sharp deterioration in credit conditions for SMEs as well as severely affected long-term capital structure and investment (Vermoesen, Deloof & Laveren, 2013 and D'Amato, 2020). Although the origin and complexity of the current crisis differ from the 2008 financial crisis (Ernst & Young, 2021), SMEs stand at the center of the disruptions and are among the most affected companies (OECD, 2021).

Emerging studies of SME United (2020) on the impact of the Covid-19 crisis show that many European SMEs are suffering from the repercussions of the shock. About 40% of SMEs report severe liquidity problems as a consequence of the economic lockdowns. The retail and construction sectors are particularly affected, with up to half of the companies in this sector

experiencing liquidity shortages. Overall, in Europe, two-thirds of SMEs had to delay investment decisions or completely curtail them. Up to 20% of SMEs lost 100% of their turnover for several weeks, leading to a decline in private consumption of about 9%. Dimson et al (2021) report that 70% of SMEs experience a drop in turnover, 20% are worried about meeting payment obligations or keeping employees on the payroll and around 30% report the forgo of valuable growth projects. These early reports on the impacts only foreshadow the effects the Covid-19 crisis will have on SMEs. While European governments provided far-reaching fiscal support to cover companies' fixed costs, prevent mass unemployment, and provide liquidity many SMEs had to forgo potential valuable investment opportunities (European Central Bank, 2021). In particular, the funding shortages and the resulting reduction in investment will have a significant long-term impact on the prosperity of SMEs (OECD, 2021). As more and more data on the Covid-19 crisis and its aftermath becomes available, scientific contributions are increasing and academics are trying to shed light on previously unexplored questions. This paper empirically analyzes the retail and wholesale sector and the construction sector, two of the most affected industries, to provide a first outlook on the severity of the shock.

Clearly, the relevance for society as a whole is given, since failing to support SMEs would cause devastation for many. Therefore, this paper academically contributes by investigating the relationship between the Covid-19 pandemic and firms' financing and investment. The results are intended to elucidate on the consequences of the government's far-reaching measures to contain the virus. Thereby, the paper finds that investment did not significantly differ during the studied periods. However, the relationship between external financing on investment amplified following the onset of the crisis, while becoming negligible during the post-crisis period. Internal finance exhibited an opposing effect, being more determined for a firm's investment in times of economic equilibrium. These results illustrate the varying relationship of the financing sources depending on the state of the economy.

This paper is organized as follows. Section 2 and 3 describe the basic theories and define the underlying concepts. It also reviews the relevant literature, discusses the findings and defines the research hypotheses for the analysis. Section 4 outlines the data and variables used for the analysis. Section 5 and 6 entails the descriptive statistic and the methodology used to analyze the impact of the Covid-19. Section 7 reports the empirical results, while section 8 compares the two industries at hand. Section 9 conducts additional tests to confirm the robustness of the

study while section 10 lists the limitations of the study. Finally, section 11 concludes the paper and recommends future research

2.0 Literature Review

This section presents the literature reviewed and outlines the empirical findings to which the work contributes: Financing constraints, SMEs financing, and its relation to firms' investment. The following chapter is thematically divided into four parts: First, the general theory of capital markets and fundamental concepts of market imperfections are reviewed. Second, SME financing constraints are examined in the context of the equilibrium. Third, theories about the financing constraints of SMEs in times of crisis are discussed. Finally, the literature findings on the interplay between firm financial constraints and investments are outlined.

2.1 General Theory of the Capital Markets and Market Imperfections

This section introduces the general concepts of imperfect markets and reviews the basic theory upon which the financial constraints literature for SMEs is built.

The Modigliani-Miller theorem, a foundational work in the corporate finance literature, states that a company's capital structure is irrelevant to its value and is composed independently of factors such as debt or taxes. Internal and external capital serve as perfect substitutes, and all opportunities with positive net present value (NPV) are financed and thus realized (Modigliani and Miller, 1958). In the frictionless capital markets of Modigliani and Miller (1958), capital is provided at the risk-free interest rate combined with a risk premium that reflects only the asset's systematic risk. In an equilibrium lending market, prices only rise when demand exceeds supply and/or supply rises until demand and supply equalize at the new equilibrium price. In reality, however, market frictions, asymmetric information, and risk-averse investors erode this concept, leading to capital allocation, preferences and constraints. Akerlof's (1970) lemon principle has accurately portrayed the fundamental problem of asymmetric information between sellers and buyers. The theory describes that buyers and sellers do not have the same amount of information they need to make an informed decision about a transaction, placing the seller at a disadvantage. The buyer who does not possess complete information is unwilling to pay a fair price due to the fear of receiving a "*lemon*".

In modern capital markets, this conflict is described by the agency theory of Jensen & Meckling (1976). The theory deals with the conflict-of-interest present in any relationship in which one party is expected to act in the best interests of the others. To overcome this, market participants require remunerations for supervision and the incentive alignment mechanism. (Tosi, Katz & Gomez-Mejia 1997). Lenders such as banks require a risk premium based not only on the systematic risk of the assets' cash flow but also on idiosyncratic factors (Degryse, Goeij & Kappert, 2010). The literature states that the size and age of a company determine its propensity to obtain capital (Sogorb-Mira, 2005; Gregory, Rutherford, Oswald & Gardiner, 2005). Older and bigger companies have greater information permeability, a larger stock of pledgeable assets that serve as collateral and better capacities to internalize their financing needs and redeploy their capital according to their exigencies (Beck and Demirguc-Kunt, 2006). The standard neoclassical growth theory (Solow,1956) identifies capital as one of the three factors driving economic growth. A lack of availability of one of the factors would inherently decelerate long-term growth.

Summarizing the above findings, the financing constraint literature has its provenance in the discrepancy of information availability between two parties, market frictions and the action of risk adverse investors. SMEs, particular affected by greater information opacity, appear to be at a disadvantage when it comes to financing compared to larger companies. Greater agency costs and lending premiums are the consequence.

2.2 SME Financing Constraints in Equilibrium

The following section reviews the literature on SME financing constraints in equilibrium. First, theoretical models are discussed that deal with the outcome of information asymmetry on credit rationing. Second, various literature is reviewed that provides empirical evidence on financing constraints.

Jaffee and Russell (1976) developed a model demonstrating credit rationing as a market response to adverse selection. In their model, borrowers have greater information about the likelihood of default than lenders. The asymmetric information leads "*dishonest*" borrowers to take advantage of lenders by deliberately defaulting on their loans whenever this leads to an increase in their utility. In response, borrowers are rationed in the amount of their borrowing to achieve an equilibrium where no one defaults. Thus, in their model, the competitive credit

market restricts the availability of credit due to information asymmetry, even for participants who can derive greater utility from repaying the loan. The authors acknowledge that, in reality, loan markets exhibit different features, with banks requiring collateral or governments imposing regulations on the market.

The model by Stiglitz & Weiss (1981) explains the functions of the credit market in the presence of limited information. The authors point out that in an equilibrium, the lending market is characterized by credit constraints and that the degree of moral hazard depends on the interest rates charged by the bank. While interest rates can serve as screening techniques, individuals that are willing to pay higher interest rates may, on average, be riskier. Their willingness to borrow at higher rates indicates that they perceive their probability of repaying the loan to be lower, ultimately lowering the banks' profit. Additionally, the authors argue that raising interest rates lowers the return of successful projects. Eventually, inducing firms to undertake projects with lower probabilities of success but higher payoffs. Hence, banks are not incentivized to reciprocate increasing credit demand with higher interest rates or smaller loans but with a limiting number of credits.

Calomiris and Hubbard (1990) developed a model to study the importance of collaterals and borrower equity in a capital market with asymmetric information. Their research suggests that the availability of external finance depends on the "*internal net worth position*" and information characteristics of the entity. Both factors are more important for "*information intensive*" firms. Their model differentiates two markets for debt financing: A "*symmetric-information*" credit market where governments and large publicity traded corporations obtain commercial papers and long-term bonds and an "*asymmetric-information*" market where information opaque borrowers retrieve bank debt. Their analysis highlights the importance of internal financing and collateral for "*information-intensive*" borrowers and that any access to the "*asymmetric-information*" market is denied after a widespread systematic shock.

Holmstrom and Tirole (1997) studied a moral hazard model on capital constraint lending. The same model was applied by Hoshi, Kashyap, and Scharfstein (1993) and Repullo and Suarez (1995) with the difference that Holmstrom and Tirole (1997) account for capital constraint intermediaries in their analysis. The model examines how the allocation of wealth among companies, intermediaries, and investors affects investment, interest rates, and monitoring mechanisms. Their model differentiates between three categories of investors with well-

capitalized firms on the one hand side and poorly capitalized firms on the other side. The model shows that after the occurrence of a capital shortage, poorly capitalized firms are the first to face financial constraints. In the model, poorly capitalized firms suffer from higher agency costs and therefore face monitoring premiums. Since intermediaries suffer from credit constraints and monitoring intensity is higher for poorly capitalized firms, they are the first to be shorted out.

In a more recent study, Ascioglu, Hegde, and McDermott (2008) investigate whether market imperfections such as information asymmetry erode the perfect substitution of internal and external capital and if capital investment is related to the cash flow of the company. Their research is the first to construct measures of information asymmetry from the microstructure literature. They define the *relative effective spread*, the *price impact of a trade,* and the *probability of informed trading* as a proxy for information asymmetry. Further, they classify their sample firms into three categories ordering them from constraint to not constraint. Their analysis suggests that firms with high information asymmetry have greater investment–cash flow sensitivity, indicating higher reliance on internal capital. Overall, their results are consistent with the above-mentioned research findings that firms for which information is opaque face greater financing constraints and rely more heavily on internal capital to finance investments.

The above models are unambiguous in their theoretical proposition that information asymmetry leads to credit constraints; moreover, there is consent in the empirical literature as to which companies are most affected. Gregory, Rutherford, Oswald, and Gardiner (2005), Sogorb Mira (2005), and Degryse, Goeij, and Kappert (2010) all argue that as companies grow in size and age, their information transparency increases simultaneously, giving them wider access to external financing. Consequently, SMEs suffer from more severe information asymmetries leading to higher financing premiums or capital constraints. Berger and Udell (1998) found that firms' capital structure varies with firm size and age. Firms follow a financial growth cycle that determines the optimal capital structure at each point in time. While larger companies can use the public capital market to adapt to changing economic conditions, SMEs have limited access to these sources. The authors' reason that greater information transparency and agency costs lead to a higher debt financing premium. Carpenter & Peterson (2002) demonstrate for a sample of 1,600 US firms that SMEs are, in fact, financially constrained in their growth. The paper by Rien (2003) analyses the growth-

cashflow sensitivity for different firm sizes. The research shows that the sensitivity of firm growth to cash flow decreases with increasing firm size, implying that SMEs are more dependent on internal funds compared to larger firms. Watson and Wilson's (2002) study identified that SMEs prefer retained earnings over debt and debt over new share issues to outsiders. Smaller firms tend to finance their operations with internal capital, while more mature firms with larger histories rely more on debt (Nofsinger and Wang 2011, Vaznyte and Andries 2019, Frank and Goyal 2002). Fazzari, Hubbard & Petersen (1988) examine the differences in investment policies of firms with financial constraints. They divide firms into three categories according to the amount of retained earnings. They observe that firms with external financing constraints show higher reliance on internal funds and are forced to have higher retention rates. The entities they identify to be most financially constrained are younger and smaller than their peers. Moreover, their investments are more dependent on cash flow and liquidity and not all investment opportunities can be exploited.

In summary, the literature identifies a strong link between information asymmetry and financial constraints. The lack of adequate knowledge about the borrower's status-quo prompts lenders such as banks to restrict credit supply or raise interest rates. Inherently, SMEs tend to suffer from bigger information opacity, consequently restricting their access to external finance.

2.3 Financing Constraints of SMEs in Terms of Crisis

The following section discusses the crisis-related financing bottlenecks of SMEs. Whereas SMEs already suffer from limited access to external capital, these inequalities may be exacerbated during an economic downturn.

Michaelas, Chittenden and Poutziouris (1999) use panel data to review different capital structure theories of SMEs in the UK. While they confirm the relevance of theories discussed in chapter 2, they provide evidence, suggesting that small firms' capital structure is time and industry dependent. The average short-term debt ratios of small firms tend to increase in times of economic downturn and decrease when economic conditions in the market improve, highlighting the sensitivity of small firms to macroeconomic changes.

Piette and Zachary (2015) studied the effect of the financial crisis of 2007/08 on SMEs financing in Belgium. In their model, banks associated the crisis with increased risks in

lending to SMEs and reduced their credit supply, particularly by adjusting the collateral required. However, in the aftermath of the crisis, Belgian banks did not impose tougher restrictions on their existing customers, suggesting that they preferred to maintain long-term relationships with present customers.

The empirical analysis of Cowling and Ledger (2012) is based on the Annual Small Business Survey in 2007/08 and investigated how UK firms' demand for external finance changed during the financial crisis of 2007/08. Their regression uses widely used firm-level variables such as size and age but utilizes binary dependent variables to model the demand for external financing. Their findings reveal that demand for credit remained constant during the crisis, but supply fell by about 13 per cent. The authors argue that in times of economic stability or economic growth, financial institutions consider a greater number of factors in their lending decisions, while during a recession, credit institutions appear to use firm size as the primary criterion for lending, thereby limiting smaller entities in their access to capital.

Dubovik (2019) studies credit rationing from 2007 until 2016 in the Dutch market. His results show that before the financial crisis of 2007/08, there was no clear evidence for differences between small and large firms' credit rationing. The author shows, that following the financial crisis, credit rationing for the largest 20% of the companies decreased substantially while credit rationing for the smallest 20% remained at a high level.

Carbo-Valverde, Rodriguez-Fernandez and Udell (2016) used firm-level panel data on over 40,000 Spanish SMEs to investigate the impact of the financial crisis of 2007/08 on firms' loan restrictions. Their findings revealed that SMEs were indeed credit-constrained during the economic downturn and that alternative sources of external financing served as substitutes for conventional financing. Credit confined SMEs made greater use of trade credit to substitute missing bank loans while unconstraint firms showed dependencies on bank loans but not trade credit.

Overall, long-term consequences for SMEs seem to diverge with companies in the Netherlands suffering long-lasting consequences from the credit squeeze while Belgian firms seem to enjoy the benefit of relationship lending. However, while SMEs already seem to be financially constrained in equilibrium, past economic recessions exacerbated that phenomenon. Capital lenders such as banks tighten capital supply and become more selective

in their choice of borrowers. In particular, age and size seem to play an even bigger role in times of economic crisis. Early research on the consequences of the Covid-19 crisis confirms the worsen credit conditions for SMEs. Corredera-Catalán, di Pietro & Trujillo-Ponce (2021) report in their paper that SMEs suffer from lower credit supply, higher interest-rates, shorter repayment period and higher requested loan guarantees during the Covid-19 crisis. Especially, sectors with high bank dependence seem to be most heavily affected. Similar impacts are outlined by Dimson et al. (2021), describing liquidity constraints that limit SME financing in Europe.

2.4 The Relationship of Financing Constraints to Firms' Investment

The following section assesses the literature dealing with the impact of financing constraints on firms' investment. First, the routes of the relationship between financing and investment are explored. Second empirical evidence is provided that financial constraint SMEs have reduced investment.

Much of the early investment literature concluded that cash flow and other financial variables have no impact on the investment function. According to the neoclassical investment theory, investment is determined by the marginal product of capital (MPK) and users' cost of capital (Mukherjee, 2015). Myers and Majluf (1984) argue that the dispersion of the firm's management to the supplier of financing intuitively creates information asymmetry, which adds a new dimension to the equation. To determine a firm's investment, it is not only sufficient to know the firm's capital requirements but also whether the desired capital can also be provided (Fazzari and Athey, 1987). Thus, imperfections in the financial market play a major role in a firm's quest for capital and are responsible for the interaction of a firm's investment and financing decisions.

Fazzari, Hubbard, and Petersen (1988) are one of the first to investigate the relationship between financing constraints and the investment behavior of firms. The authors argue that information asymmetry leads to an increase in the cost of external financing, as the counterparty requires compensation for the verification of its investment. Firms, therefore, tend to follow a pecking order when financing investments (Myers and Majluf, 1984), leading to a clear preference for internal over external financing. Companies must resort to external funding only when internal funding is insufficient to continue their investments. Consequently, firms' investment is determined by fluctuations in cash flows, so a firm's

capital expenditure depends essentially on the funds it can generate internally and the premium it pays for external financing.

Campello, Graham and Harvey (2010) surveyed 1,050 Chief Financial Officers during the global financial crisis of 2007/08. By employing a matching estimator analysis to account for significant cross-sectional variation in the investment environment of constrained and unconstrained firms, they demonstrate that financially constrained firms had to forgo positive NPV projects. Moreover, they show that constrained firms reduce marketing, R&D and human capital spending, as well as burning through their credit line more rapidly, in the prospect of credit rejection. Up to 90% of the companies in the sample reported that the tightening of credit supply prevented them from carrying out all valuable investment opportunities. Becchetti and Trovato (2002) empirical findings show that small firms have higher than average growth potential but that a lack of external finance, as well as limited access to foreign markets, hinders expansion. Huovinen and Finnish (2011) employed longitudinal surveys to research the financing constraints of 2,000 SMEs in Finland during the financial crisis of 2007/08. Up to 10% of the sample reported major financing difficulties and 21% had solvency problems. Overall, SMEs reported an increasing demand for short-term financing and a postponement of long-term investments.

In summary, the literature provides clear evidence that financial constraints are associated with a decline in investment. Companies that do not have sufficient access to external sources of capital are usually not able to fully substitute them with internal financing and therefore cannot exploit every investment opportunity.

2.5 Summary

To synthesize all the above finding's, information asymmetry is the core obstacle preventing SMEs from obtaining sufficient external funding. The fundamental problem of asymmetric information in any exchange penalizes the party with greater information opacity. SMEs inherently have less information dissemination due to the nature of their structure and the markets they are operating in. As a result, SMEs must compensate lenders by paying higher premiums on loans. While in a state of an equilibrium higher premiums are sufficient to compensate for the information asymmetry, this is no longer satisfactory in times of crisis. Lenders, especially banks, not only raise the cost of debt but also tightening the allocation of credit. Consequently, leaving some SMEs without the possibility to obtain sufficient

financing. Since SME investment depends not only on the availability of projects with positive NPV, but also on the ability to finance these projects, financial constraints have a direct impact on SME investment. Firms that do not obtain sufficient financing have to forgo valuable growth projects that are essential for long-term prosperity. Firms' investment is thus depending on the ability to raise financing, but as internal financing is limited in times of crisis and external financing unobtainable, investment is severely restricted.

3.0 Hypothesis development

The argumentation of this paper is based on the assumption that SMEs suffer from liquidity shortages during an economic recession. Earnings are no longer sufficient to adequately support the entity's networking capital requirements and necessary capital expenditure to facilitate future growth. During the Covid-19 crisis, governments enforced server lockdowns across European countries and companies were compelled to close operations for several months. As a result, companies' balance sheets were affected, and the loss of revenue caused companies to resort more to external capital – in particular debt financing. Petersen & Rajan (1994) and Berger & Udell (1998), both show that bank debt is the prioritized source of external finance for SMEs. These results are also consistent with the pecking order theory of Myers & Majluf (1984), according to which companies prefer internally generated funds first, then debt and finally equity. It is, therefore, to be expected that SMEs will increase their bank lending to compensate for the lack of internal funds after the outbreak of the Covid 19 crisis and the lockdowns. Thus, to test this assumption following hypothesis was developed:

H1: The level of external financing of companies increases following the crisis in Covid-19.

As outlined in the preceding section, various studies have confirmed that SMEs suffer from a decline in investment in times of crisis. A crisis lowers the stream of a cooperation's cash flow and external sources are no perfect substitutes to entirely cushion the effect. However, while SMEs' dependence on external capital increases in times of crisis, the willingness of external investors to provide funds has not. Stiglitz & Weiss (1981) show in their model, that banks oppose an increasing credit demand not with higher interest rates or smaller loans but with a limited number of credits. Information asymmetries are aggravated by the increasing uncertainty of the outlook (Mishkin, 1990) and SMEs are unable to obtain enough financing to exploit all possible investment opportunities. Consequently, it can be expected that

investment declines following the Covid-19 pandemic and the following hypothesis is developed to test the assumption:

H2: Investment of private firms decline following the onset of the corona crisis.

During a crisis, banks restrict their lending, and the selection of potential financing candidates becomes more stringent. (Deyoung, Gron, Torna & Winton 2015). Especially, size and age become important factors determining the propensity to obtain capital from banks (Sogorb-Mira, 2005 and Gregory, Rutherford, Oswald and Gardiner, 2005). As a result, SMEs find it more difficult to access external sources of finance and tend to become more financially constrained. Internal cash flow becomes the dominant source of cash and determinant of whether firms can finance current and future expenses. The availability of own funds thus plays a decisive role in deciding whether a company can finance an investment or not. It is, therefore, expected that during the time of the Covid-19 pandemic the availability of the internal cash flow is the decisive factor in determining investment. To test this assumption, the following hypothesis was developed:

H3: Investments of private firms become more dependent on internal finance than external finance during the corona crisis

As shown in the preceding section, SME investment is determined by the availability of internal cash flow and the capability to obtain capital from external sources. Both are restricted in times of crisis and reduce the level of investment. Following the lifting of government restrictions after the vaccination waves in 2021 and the decline in Covid-19 cases, it is expected that short-term market conditions will also ease, and economic activity will recover from the pre-crisis period. Companies can expect their cash flows to pick up and bank lending conditions are also likely to become relaxed again (European Central Bank, 2022). Thus, it can be expected that companies have enough credit available to undertake capital expenditures again. To test this assumption following hypothesis was developed:

H4: The level of investment recovered in the past-crisis period

4.0 Data and Variable description

This section describes the data sources used for the analysis and defines the variables used to test the hypotheses made in the preceding section. The dependent variables (firms'

investment), the independent firm level variables, and the control variables are specified in the respective sections.

4.1 Data

Firm level data over the period from 2017 to 2021 was obtained from the Bureau van Dijk Orbis database. The Orbis database is a frequently used source for academic research as it contains extensive data on public companies from all over the world as well as rich data on private companies. Two datasets were created and downloaded, one for the retail and wholesale industry and one for the construction industry. The search strategy was based on 7 steps, resulting in a sample size of 2,170 and 996 respectively. First, only companies that had an active status were included in the sample. Second, only private limited companies were included. Third, the analysis pertains to only companies located in Germany, Italy, Netherlands, Spain, United Kingdome, and France. Other countries were excluded to achieve a better cross-industry comparison in the analysis. The aforementioned countries had similar declines in their GDP during the crisis (European Commission, n.d.) and, except for the United Kingdom, had the similar rates of vaccination against the Covid 19 virus (Ritchie, 2020). Thus, results are expected to be comparable between the different economies. Fourth, NAICS codes 42, 44, 45 and 23 from 2017 were included to identify only retail/whole and construction businesses. The paper follows the classification of the European Commission which defines a firm into a small category when it has between 10–49 employees and €2–€10 million revenue or total assets, and medium category when it has between 50 and 249 employees with a maximum €50 million revenue or €43 million total assets (European Commisson, n.d.). The fifth, sixth and seventh step consisted of defining the European Commission classifications for SMEs for the years 2017 until 2021. In addition, companies with limited or no up-to-date financial data, as well as public authorities, states and governments were excluded, as their decisions are primarily influenced by non-economic considerations. Both datasets were manually screened, outliers for the dependent variable were excluded as well as companies that did not provide data on all variables. The final sample for the retail and wholesale and construction industry consisted of 1804 and 682 firms, respectively.

4.2 Variables

The variable of interest and the main dependent variable in the analysis is the investment of a SME. Investment is usually referred to as increasing one's own assets or buying the existing

assets of another company. Most prior research proxies' investment by focusing on capital expenditure, mergers and acquisitions and research & development (Lawless, Martinez-Cillero, O'Toole, Gargan, Cantwell & McGoldrick 2020). Private companies cannot usually pay for their acquisitions with equity, so their total investments are likely to involve relatively more CAPEX than those of listed companies. As the Orbis database does not allow to differentiate between those forms of investment an alternative variable must be constructed. Thereby, the paper follows the work of Asker, Jarre-Mensa & Ljungqvist (2011), Badertscher, Shroff& White (2013) and Zubair, Kabir & Huang (2020) by measuring investment as gross investment, which is the annual increase (change) in fixed assets plus depreciation scaled by total assets at the beginning of the year. Furthermore, an alternative measure of investment is constructed, where net investment is the annual increase (change) in tangible fixed assets plus depreciation scaled by total assets at the beginning of the year. Whereas CapEx and M&A increases fixed assets, R&D does not affect fixed asset, hence is not captured by the paper's investment variable. This data limitation is acknowledged and addressed at a later stage.

The firm's financing is differentiated into three distinct measurements. First, internal finance is defined as net income plus depreciation scaled by total assets at the beginning of the year. Second, external debt financing is defined as the sum of the increase of long and short-term debt scaled by total assets at the beginning of the year. Third, shareholder financing is measures as change in shareholders' equity scaled by total assets at the beginning of the year. Other explanatory variables used to explain variations in a business investment are widely known firm-level variables such as size, defined as the natural logarithm of the book value of total assets. Growth, defined as change in annual employment or the firms cashflow measured as the sum of the firms EBIT and depreciation scaled by total assets at the beginning of the year. Various research identified cash holdings as a strong predictor for firms' investment especially in times of crisis (Arslan, Florackis & Ozkan, 2006 and Chang, Benson & Faff 2017). To account for this, a variable for the company's cash holdings is introduced to capture the impact of cash and cash equivalents on the company's investments. Cash holdings are defined as cash and equivalents scaled by total assets at the beginning of the year. Last, two dummy variables define the pre- and post-crisis period.

5.0 Descriptive Statistic

5.1 Retail and Wholesale Industry

Table 1a), 1b) and 1c) (See Appendix) present the summary statistic for the retail and wholesale industry. Tables 2a) and 2b) (See Appendix) give the result of the first independent samples t-test and the effect sizes for the pre-crisis period. Tables 3a) and 3b) (See Appendix) give the result of the second independent samples t-test and the effect sizes for the post-crisis period. The results show a significant p-value for the Levene's test for equality of variance in both periods for cash and cash equivalents and significant p-values for internal finance and cashflow in the post-crisis period. In all cases, the null hypothsis of Levene's test is rejected and concluded that the variance of the variables significantly differs in the two time periods. For those variables, the "Equal variances not assumed" row is considered for further analysis.

For the whole period and for all companies in the sample, investment as a percentage of total assets averaged 2.882% with a median value of 2.078%. Firms invested on average 2.893% in the pre-crisis period and 2,871% in the crisis and post crisis period, a decrease of 0.022 percentage points. All differences are statistically insignificant. The average firms had an external finance (change in bank debt over total assets) of 4.018% in the pre-crisis period which declined to 0.667% in the crisis period and increase in the post-crisis period to 6.464%. Considering the effect of the crisis, external finance decreases by 3.351 percentage points during the period before increasing by 6.463 percentage points in the post-crisis period. External financing has a significance level $\alpha > 0.05$ for all periods, so that the null hypothesis can be rejected, and the conclusion can be drawn that the average external financing of the companies in the sample differs significantly during the sample periods. A similar effect can be observed for internal finance (net income plus depreciation as percentage of total assets). Internal finance decreased by 0.866 percentage points from 8.596% to 7.730% during the crisis period before increasing to 11.412% in the post crisis period. Also, internal finance reports a significance level $\alpha > 0.05$ for all periods, implying significant differences during the sample periods. To quantifying the relationship between the two financing groups, the paper considers the Glass' delta effect sizes. Thereby, it follows the classification of Becker (2000) and Glass McGaw & Smith (1981), that a value of 0.2 states a small effect, a value of 0.5 a medium effect and a value of 0.8 a large effect. In both periods, the value for internal financing is below 0.2 and for external financing above 0.2. Thus, the magnitude of the effect can be defined as small for internal finance and medium for external finance. Companies in the retail and wholesale sectors appear to have suffered from financial constraints during the crisis, with a greater contraction in external finance.

While the size of firms (natural logarithm of the book value of total assets) remained stable during the sample period, cash flow (EBIT plus depreciation scaled by total assets) decreased by 1.048 percentage points during the crisis period before increasing by 4.183 percentage points in the post-crisis period. Both differences are significant and display a small effect size, confirming the reductions in firms cashflow during the crisis period. Growth (change in annual employment) shows a significant decline by 2.501 percentage points during the crisis period as well as a significant decline 1.967% in the post-crisis period. The effect size in the pre-crisis period is small while it is defined as medium in the post-crisis period. Cash and cash equivalents (cash and cash equivalents as a percentage of total assets) had a statically significant increase from 13.089% in the pre-crisis period to 15.728% in the crisis period and 18.257% in the post-crisis period, indicating the great importance of liquid assets on firm's balance sheets in times of crisis (Chang & Yang, 2022). The effect size for both period is regarded to be small.

5.2 Correlation Retail and Wholesale Industry

Table 4) (See Appendix) presents the Pearson correlation coefficient between the variables. It can be observed that all investment variables show a significant positive correlation to each other. The correlation between the change in fixed assets (Investment_1) and the change in tangible fixed assets (Investment_3) shows that the company's investments can be well described by the investments in tangible fixed assets. As expected, investments show a significant positive correlation with cash flow and growth and a negative correlation with cash and equivalents. Moreover, external financing shows a significantly stronger correlation with the investment variables than internal financing, suggesting that firms' investments are more readily financed with external capital. External and internal funding show a negative correlation, indicating that they substitute for each other rather than complement each other. All independent variables besides cashflow and internal finance show a relative low correlation suggesting that multicollinearity can be a concern in this study. To investigate this potential issue the Variance Inflation Factor (VIF) - a commonly applied measure to identify the degree of multicollinearity is utilized. Gujarati, Porter & Gunasekar (2012) report in their publication that a VIF value greater than 10 displays multicollinearity. The paper, however, follows Almeida & Eid (2014) who use the cut-off point of 5 or less to eliminate any concerns about multicollinearity. Table 5) reports the VIF calculated for each independent variable in

the study. The table shows that all values are well below the proposed threshold indicator, meaning that multicollinearity is not a concern in the retail and wholesale analysis.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	,036	,002		15,579	<,001		
	Internal Finance 2021	,009	,003	,077	3,411	<,001	,307	3,259
	External Finance 2021	,004	,001	,054	4,034	<,001	,870	1,149
	Shareholder equity 2021	-,165	,140	-,015	-1,181	,238	,994	1,006
	Cashflow 2021	,004	,003	,030	1,327	,185	,315	3,170
	Size 2021	-,004	,001	-,084	-6,648	<,001	,990	1,010
	Growth 2021	,004	,001	,034	2,638	,008	,961	1,040
	Cash/equivalents 2021	-,006	,001	-,060	-4,622	<,001	,933	1,071
	Crisis	,000	,001	-,010	-,761	,447	,875	1,143
	Post_Crisis	1,375E-5	,001	,000	,026	,979	,847	1,180

[a.] Dependent Variable: Investment

Table 5) Variance Inflation Factor: Retail and Wholesale Industry

5.3 Construction Industry

Table 6a) and 6b) (See Appendix) presents the summary statistic for the construction industry. Table 7a) and 7b) (See Appendix) gives the result of the first independent samples t-test and the effect sizes for the pre-crisis period. Table 8a) and 8b) (See Appendix) gives the result of the second independent samples t-test and the effect sizes for the post-crisis period. The results show a significant p-value for the Levene's test for equality of variance in both periods for size and significant p-values for investment 2 and cash and cash equivalents in the pre-crisis period. In all cases, the null hypothsis of Levene's test is rejected and concluded that the variance of the variables significantly differs in the two time periods. For those variables, the "Equal variances not assumed" row is considered for further analysis.

For the entire period and across all firms in the sample, investment as a percentage of total assets averaged 3.083% with a median of 1.984%. Before the crisis, firms invested an average of 3.157%, during the crisis 3.042% and after the crisis 3.049%, a decrease of 0.115 percentage points. All differences are statistically insignificant besides the Investment 4 variable in the post crisis period, that shows a small effect size.

The average enterprises had an external financing (change in bank debt to total assets) of 4.098% in the pre-crisis period, which decreased to 1.089% in the crisis period and increased

to 12.645% in the post-crisis period. Taking into account the impact of the crisis, external financing decreases by 3.009 percentage points during the period before increasing by 11.556 percentage points in the post-crisis period.

External Finance has a significance level $\alpha > 0.05$ for all periods, so that the null hypothesis can be rejected, and it can be concluded that the difference in both periods is significant with a medium size effect. A similar effect is observed for internal financing (net profit plus depreciation as a percentage of total assets). Internal Finance decreased by 1.541 percentage points from 11.064% to 9.523% during the crisis period before increasing to 12.081% in the post-crisis period. Also, internal finance reports a significance level $\alpha > 0.05$ for all periods, implying both a significant differences during the sample periods with a small effect size. Also, companies in the construction sectors appear to have suffered from financial constraints during the crisis, with a greater reduction on external financing.

While firm size (natural logarithm of book value of total assets) remained stable during the sample period, cash flow (EBIT plus depreciation scaled by total assets) decreased by 2.142 percentage points during the crisis period before increasing by 3.156 percentage points in the post-crisis period. Both differences are significant and display a small effect size, confirming the reductions in firms cashflow during the crisis period. Growth (change in annual employment) declined by 1.369 percentage points during the crisis period and 1.526% in the post crisis period. Only the decline in the pre-crisis period is statistically significant with a small effect size. Cash and cash equivalents (ratio of cash and cash equivalents to total assets) increased from 20.5% in the pre-crisis period to 23.213% in the crisis period and 27.97% in the post-crisis period, indicating the great importance of cash in corporate balance sheets in times of crisis (Chang & Yang, 2022). Only the pre-crisis increases in significant with a small effect size.

5.4 Correlation Construction Industry

Table 9) (See Appendix) shows the Pearson correlation coefficient between the variables. It can be observed that all investment variables have a significant positive correlation with each other. The change in fixed assets (Investment_1) and the change in tangible fixed assets (Investment_3) show a perfect positive correlation, indicating that the investments of the sample companies in the construction industry are determined by tangible fixed assets. As expected, investment shows a significant positive correlation with cash flow and growth and a

negative correlation with cash and cash equivalents. In contrast to the wholesale and retail sample, internal finance demonstrates a stronger correlation with the investment variables than external finance and external and internal finance are positively correlated. All independent variables except cash flow and internal finance have a relatively low correlation, suggesting that multicollinearity can be a problem in this study. Table 10) reports the VIF measure, calculated in the same manner as in previous results. While all variables show a VIF value of close to 1, Internal Finance and cashflow displaying results close to 15. According to Gujarati, Porter & Gunasekar (2012), multicollinearity is therefore a concern in this analysis.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	,050	,004		13,909	<,001		
	Internal Finance 2021	,112	,013	,575	8,345	<,001	,072	13,951
	External Finance 2021	,006	,002	,068	3,533	<,001	,919	1,088
	Shareholder equity 2021	-,017	,151	-,002	-,112	,911	,991	1,009
	Cashflow 2021	-,062	,011	-,380	-5,483	<,001	,071	14,135
	Size 2021	-,007	,001	-,136	-7,257	<,001	,972	1,028
	Growth 2021	-,004	,003	-,022	-1,151	,250	,960	1,042
	Cash and equivalents 2021	-,016	,002	-,160	-8,034	<,001	,855	1,170

a. Dependent Variable: Investment 1 2021

Table 10) Variance Inflation Factor: Construction Industry

5.5 Summary

Comparing the results from both datasets some similarities and difference become evident. Foremost, in both industries firms reduced their investment during the crisis period while only firms within the construction industry slightly increased their investment in the post-crisis period. Moreover, in both industries firms had a reduction in internal as well as external finance. While external financing fell by about 3 percentage points for both industries, internal financing fell by only 0.866 percentage points in retail and wholesale industry, while it fell by 1.541 percentage points in the construction industry. The size effect was consistently larger for external financing across both samples and both time periods. These findings are in line with the SME United (2020) report, showing that up to 50% of the SMEs in the retail and construction industry face liquidity shortages and Gourinchas, Kalemli-Özcan, Penciakova & Sander (2020) who report that banks became more stringent in their lending conditions. (European Cluster Collaboration Platform, 2020). Growth, measured in employment, declined

by around 1.2 percentage points more in the retail and wholesale industry. Joseph, Kneer, Van Horen & Saleheen (2020) and Chang & Yang, (2022) both report that the availability of cash is a critical factor determining investment and SMEs' financing, not only during the crisis but also in the recovery phase. Sample firms act in line with the notion, increasing their cash and cash equivalents drastically during the crisis period. Finally, in the retail and wholesale sample, external financing shows a significantly stronger correlation with the investment variables, while in the construction sample internal financing shows a stronger correlation with the investment variables. This observation can be attributed to the fact that the companies in the construction sample hold a higher percentage of liquid assets and are therefore less dependent on external capital to finance their expenditures.

5.6 Mann–Whitney U test

The Mann–Whitney U is a non-parametric test of null hypothesis that can be utilized to compare the medians of two different groups. Unlike the independent sample t-test permits the Mann-Whitney U-test to draw conclusion about the sample also when the equal variance assumption is violated (McKnight & Najab, 2010). During the analysis of the descriptive statistic Levene's test reported significant p-values for 8 variables, thus indicating the violation of the equal variance assumption. During the construction industry analysis, in both periods, showed size significant results as well as investment_2 and cash and cash equivalents in the pre-crisis period. While analyzing the retail sector cash and cash equivalents had significant results for both periods and internal finance and cashflow in the post-crisis period. The following analysis is performed to investigate the relationship between the variables and test previous results. One of the assumptions for the Mann-Whitney U test is that the distributions to be compared have the same shape. Split histograms were compiled to test this assumption (See Appendix). All distributions of interest demonstrate sufficient similarities to be compared with the Mann–Whitney U test. Table 11a) and 11b) (See Appendix) report the construction industry test statistic for the Mann–Whitney U test. It can be observed that all variables besides investment 2 show a significant result at an α > 0.05, indicating median differences between the two groups. Table 12a) and 12b) (See Appendix) report the retail and wholesale test statistic for the Mann–Whitney U test. All variables of interest show a significance at α > 0.05, confirming the statistically difference observed in the independent sample t-test. Overall, with exception of the investment 2 variable the statistically differences observed in the independent sample t-test can be validated and used for the further analysis.

6.0 Methodology

This section describes the methodology used to test the formulated hypotheses. Thereby, the empirical models for estimating the impact of the Covid-19 period on financing and investment are discussed.

To assess the consequences of the corona crisis on the sample firms a balanced fixed effect panel regression is performed. Investment, proxied as a change in fixed assets plus depreciation scaled by total assets, serves as the dependent variable. This paper follows previous research from Badertscher, Shroff, & White (2013) and Yang et al (2009) who identified firm-level variables such as cash flow, firm size and age as the main explanatory variables to analyze SMEs investment. Cash and cash equivalents serve as an additional independent variable, as research by Martínez-Sola, García-Teruel & Martínez-Solano (2018) has shown that it can greatly improve SMEs' adaptability and resilience to crises. Internal financing, external financing and equity are representative of the different sources of financing for enterprises. In line with previous literature, the analysis includes fixed effects to account for the invariant unobservable characteristics. The following fixed effect Regression Model 1) is estimated:

$$
\begin{aligned}
Investment = \alpha + \beta 1\ Crisis + \ &\beta 2\ Post-crisis + \beta 3\ Internal\ Finance_{it} \\
&+ \beta 4\ External\ Finance_{it} + \ \beta 5\ Shareholders\ equity_{it} + \ \beta 6\ Cash\ Flow_{it} \\
&+ \beta 7\ Size_{it} + \beta 8\ Growth_{it} + \beta 9\ Cash\ and\ equivalents_{it} + Firm_i + \varepsilon_{it}
\end{aligned}
$$

The subscript i relates to individual firms and t to different years. Crisis represents a dummy variable equal to 1 for the year 2020, and 0 otherwise. Post-crisis reports a dummy variable that is equal to 1 for the year 2021, and 0 otherwise.

To investigate whether the financial crisis has had an impact on the way internal and external financing influence investment, a modified version of Regression Model 1), namely Regression Model 2) is adopted:

$$
\begin{aligned}
Investment = {} & \alpha + \beta 1\ Crisis\ (Post - crisis) + \beta 2\ Internal\ Finance_{it} \\
& + \beta 3\ External\ Finance_{it} + \beta 4\ Shareholders\ equity_{it} \\
& + \beta 5\ Internal\ Finance_{it} * Crisis\ (Post - crisis) \\
& + \beta 6\ External\ Finance_{it} * Crisis\ (Post - crisis) + \beta 7\ Size_{it} \\
& + \beta 8\ Growth_{it} + \beta 9\ Cashflow_{it} + \beta 10\ Cash\ and\ equivalents_{it} + Firm_{i} \\
& + \varepsilon_{it}
\end{aligned}
$$

Regression Model 2) is estimated twice, once for the crisis and once for the post-crisis period. The coefficients of interest are the two interaction coefficients β4 and β5, which capture the change in the effect of internal and external finance, respectively, on a firm's investment during the crisis (post-crisis) period. The interaction model is applied to investigate whether the impact of the two financing methods differs statistically. Moreover, to quantify the effect of the different financing sources over the sample time, separate regressions with Regression Model 1) are carried out across the sub-periods. This approach allows researching the coefficients of the financing sources over the different periods.

7.0 Empirical Results

7.1 External Finance Analysis

To test Hypothesis 1 whether external financing increased following the Covid-19 crisis, it is examined whether there was a significant difference between the pre-crisis and crisis period. Based on the independent t-test conducted as part of the descriptive statistics, it can be observed that in both industries external finance decreased during the crisis. External finance decreased by 0.667% in the retail and wholesale industry and 1.089% in the construction industry. The decline was significant for both sectors with a medium effect size. Also, internal finance decreased significantly in the crisis period, even though with lower effect sizes. These results provide the first insights into how the Covid-19 impacted the financing behavior of SMEs.

In perfect capital markets, SMEs would replace the lack of internal funding with sufficient external funding to compensate for any loss of income and ensure seamless business operations. However, it can be observed that this reaction fails to materialize as companies not only reduce internal but also external financing. The findings are in line with recent

research from Calabrese, Cowling & Liu (2022) who investigated the dynamics of SME financing in the UK in response to Covid-19. They report that 92.1% of debt financing during the crisis period was backed by the government and that banks became reluctant to issue new debt without sufficient collateral. The European Commission (2021) also reports that it is essential for governments to provide full or partial loan guarantees to SMEs to ensure that banks provide adequate lending to illiquid SMEs. Both results indicate that SMEs have limited access to external financing and that only external support can cushion the effect. By all means, firms reduce the amount of external financing, which contradicts Hypothesis 1 that firms would increase external financing following the Covid-19 crisis. For that reason, Hypothesis 1 of this paper is rejected. These results are evidence of the inadequacy of capital markets and are related to the findings of the literature review, especially Calomiris and Hubbard (1990). Their model stresses the importance of internal financing and collateral for lenders and predicts that information-intensive borrowers such as SMEs will be the first to face financial constraints after a systemic shock.

7.2 Investment Analysis

The results of the Regression Model 1) are examined to test Hypothesis 2 and Hypothesis 4, whether investment declined during the Covid-19 crisis and whether investment increased in the post-crisis period. Table 13a) and 13b) present the empirical results for construction industry and the retail and wholesale industry, respectively. Model 1) displays the baseline regression comprising only Crisis, Post-Crisis and firm fixed effects. Model 8) represents the extended regression exhibiting all firm-level control variables, financing sources as well as the Crisis, Post-Crisis variable and firm fixed effects.

7.2.1 Construction Industry

The ANOVA test reports high F-statistics and significant results from Model 2) to Model 8). The adjusted R-square increases continuously with each variable included and reaches 6.3 % in Model 8). The R-square is slightly lower than comparable studies by Vermoesen Deloof & Laveren (2013) and Akbar Rehman & Ormrod (2013) who reported R-square values around the 14% mark. However, as the models show a significant F-statistic it can be assumed that the variation in firms' investment is well explained. Overall, the results indicate no statistically significant decline in investment both during and after the Covid-19 crisis. Both Crisis and Post-crisis variables show no significant effect across all models. Internal Finance,

external finance, cash flow, size and cash and cash equivalents all show significant results in Model 8). Both financing sources show positive coefficients suggesting that firms with availability to internal or external funding undertake more investment. Comparing the coefficients of internal and external financing in Model 8), it can be stated that internal financing has a greater impact on investment than external financing. Cashflow, size and cash and cash equivalents show negative coefficients indicating that bigger firms with more cash inflows and cash reserves undertake less investment. Arslan, Florackis & Ozkan (2006) report in their analysis that in times of crisis firms utilise cash reserves as a hedging device to protect themselves against fluctuations in cash flow and financial constraints. Therefore, they become more selective in investment opportunities and only firms with excessive cash reserves are not sensitive to funding constraints. Overall, these results are in contradiction to Hypothesis 2 and Hypothesis 4 which predicts firms' investment to decline following the Covid-19 crisis and increase during the post-crisis period.

7.2.2 Retail and Wholesale Industry

The ANOVA test reports high F-statistics and significant results from Model 2) to Model 8). The adjusted R-square increases continuously with each variable incorporated and reaches 2 % in Model 8). This represents a smaller value than in the construction industry and a significantly lower R-square than in the comparable studies by Vermoesen Deloof & Laveren (2013) and Akbar Rehman & Ormrod (2013). However, as the models show a significant F-statistic it can be assumed that the variation in firms' investment is well explained. Model 1) shows a t-statistic of -1.948 and a p-value of 0.052 for the crisis-period, almost being significant at a 5% level. Overall, however, across the models, no statistically significant change in investment both during and after the Covid-19 crisis can be observed. In Model 8), internal finance, external finance, size, growth and cash and cash equivalents all show significant results. All significant variables show positive coefficients indicating that the availability of financing as well as bigger, growing firms with cash and cash equivalents undertake more investment. In contrast to the construction industry, the signs for cash flow, size and cash and cash equivalents assets are positive revealing the differences between the industries. In a similar notion as in the construction industry and in line with previous research exhibits internal finance a bigger coefficient and thus a larger effect on firms' investment. Overall, these results are in contradiction to Hypothesis 2 and Hypothesis 4 which predicts firms' investment to decline following the Covid-19 crisis and recoup in the post-crisis period.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.023	.001		41.733	<.001
	Crisis_	-.001	.001	-.025	-1.193	.233
	Post_Crisis	.000	.001	.002	.118	.906
2	(Constant)	.020	.001		30.579	<.001
	Crisis_	-.001	.001	-.014	-.705	.481
	Post_Crisis	8.953E-5	.001	.002	.096	.924
	Internal Finance 2021	.026	.004	.139	7.177	<.001
3	(Constant)	.020	.001		30.590	<.001
	Crisis_	-.001	.001	-.011	-.555	.579
	Post_Crisis	.000	.001	-.006	-.284	.777
	Internal Finance 2021	.024	.004	.130	6.691	<.001
	External Finance 2021	.006	.002	.072	3.685	<.001
4	(Constant)	.020	.001		30.576	<.001
	Crisis_	-.001	.001	-.011	-.554	.579
	Post_Crisis	.000	.001	-.006	-.282	.778
	Internal Finance 2021	.024	.004	.130	6.625	<.001
	External Finance 2021	.006	.002	.072	3.687	<.001
	Shareholder equity 2021	.061	.147	.008	.416	.678
5	(Constant)	.020	.001		30.591	<.001
	Crisis_	-.001	.001	-.013	-.633	.527
	Post_Crisis	.000	.001	-.009	-.415	.678
	Internal Finance 2021	.051	.014	.274	3.723	<.001
	External Finance 2021	.006	.002	.080	4.004	<.001
	Shareholder equity 2021	.063	.147	.008	.428	.669
	Cashflow 2021	-.023	.011	-.151	-2.037	.042
6	(Constant)	.048	.004		13.470	<.001
	Crisis_	.000	.001	-.010	-.492	.622
	Post_Crisis	2.099E-5	.001	.000	.023	.982
	Internal Finance 2021	.066	.014	.355	4.822	<.001
	External Finance 2021	.007	.002	.091	4.618	<.001
	Shareholder equity 2021	.060	.145	.008	.411	.681
	Cashflow 2021	-.035	.011	-.228	-3.080	.002
	Size 2021	-.007	.001	-.153	-7.945	<.001
7	(Constant)	.048	.004		13.472	<.001
	Crisis_	.000	.001	-.008	-.408	.683
	Post_Crisis	.000	.001	.007	.334	.738
	Internal Finance 2021	.067	.014	.362	4.923	<.001
	External Finance 2021	.007	.002	.086	4.305	<.001
	Shareholder equity 2021	.061	.145	.008	.421	.674
	Cashflow 2021	-.037	.011	-.241	-3.246	.001
	Size 2021	-.007	.001	-.153	-7.950	<.001
	Growth 2021	.008	.003	.047	2.395	.017
8	(Constant)	.048	.004		13.662	<.001
	Crisis_	.000	.001	.003	.129	.897
	Post_Crisis	.001	.001	.022	1.072	.284
	Internal Finance 2021	.073	.014	.390	5.328	<.001
	External Finance 2021	.008	.002	.100	5.044	<.001
	Shareholder equity 2021	.039	.144	.005	.268	.789
	Cashflow 2021	-.034	.011	-.220	-2.993	.003
	Size 2021	-.007	.001	-.145	-7.562	<.001
	Growth 2021	.006	.003	.037	1.920	.055
	Cash and equivalents 2021	-.013	.002	-.134	-6.492	<.001

[a] Dependent Variable: Investment

Table 13a) Results from Regression Model 1): Construction Industry

Coefficients[a]

| Model | | Unstandardized Coefficients | | Standardized Coefficients | | |
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.021	.000		71.416	.000
	Crisis	-.001	.001	-.026	-1.948	.052
	Post_Crisis	.000	.001	-.008	-.564	.573
2	(Constant)	.021	.000		63.297	.000
	Crisis	-.001	.001	-.023	-1.716	.086
	Post_Crisis	-.001	.001	-.014	-1.029	.303
	Internal Finance 2021	.010	.002	.084	6.633	<.001
3	(Constant)	.020	.000		61.857	.000
	Crisis	-.001	.001	-.019	-1.387	.166
	Post_Crisis	-.001	.001	-.017	-1.294	.196
	Internal Finance 2021	.012	.002	.096	7.391	<.001
	External Finance 2021	.004	.001	.055	4.275	<.001
4	(Constant)	.020	.000		61.863	.000
	Crisis	-.001	.001	-.019	-1.414	.158
	Post_Crisis	-.001	.001	-.017	-1.299	.194
	Internal Finance 2021	.012	.002	.096	7.417	<.001
	External Finance 2021	.004	.001	.056	4.304	<.001
	Shareholder equity 2021	-.125	.141	-.011	-.885	.376
5	(Constant)	.020	.000		58.817	.000
	Crisis	-.001	.001	-.019	-1.413	.158
	Post_Crisis	-.001	.001	-.018	-1.328	.184
	Internal Finance 2021	.009	.003	.076	3.364	<.001
	External Finance 2021	.004	.001	.052	3.892	<.001
	Shareholder equity 2021	-.124	.141	-.011	-.882	.378
	Cashflow 2021	.003	.003	.023	1.051	.293
6	(Constant)	.035	.002		15.131	<.001
	Crisis	-.001	.001	-.017	-1.285	.199
	Post_Crisis	-.001	.001	-.013	-.956	.339
	Internal Finance 2021	.010	.003	.080	3.516	<.001
	External Finance 2021	.004	.001	.056	4.207	<.001
	Shareholder equity 2021	-.162	.140	-.015	-1.153	.249
	Cashflow 2021	.002	.003	.018	.824	.410
	Size 2021	-.004	.001	-.081	-6.406	<.001
7	(Constant)	.035	.002		15.160	<.001
	Crisis	-.001	.001	-.015	-1.134	.257
	Post_Crisis	.000	.001	-.008	-.562	.574
	Internal Finance 2021	.009	.003	.077	3.401	<.001
	External Finance 2021	.004	.001	.052	3.890	<.001
	Shareholder equity 2021	-.171	.140	-.015	-1.222	.222
	Cashflow 2021	.002	.003	.017	.772	.440
	Size 2021	-.004	.001	-.082	-6.463	<.001
	Growth 2021	.004	.001	.034	2.688	.007
8	(Constant)	.036	.002		15.579	<.001
	Crisis	.000	.001	-.010	-.761	.447
	Post_Crisis	1.375E-5	.001	.000	.026	.979
	Internal Finance 2021	.009	.003	.077	3.411	<.001
	External Finance 2021	.004	.001	.054	4.034	<.001
	Shareholder equity 2021	-.165	.140	-.015	-1.181	.238
	Cashflow 2021	.004	.003	.030	1.327	.185
	Size 2021	-.004	.001	-.084	-6.648	<.001
	Growth 2021	.004	.001	.034	2.638	.008
	Cash/equivalents 2021	-.006	.001	-.060	-4.622	<.001

[a.] Dependent Variable: Investment

Table 13b) Results from Regression Model 1): Retail and Wholesale Industry

7.2.3 Summary

Summarizing the findings from both industries, investment did not decline significantly during the crisis or post-crisis period. Both models showed significant coefficients for internal and external finance, indicating that in both industries the availability of either internal or external finance is an important factor in determining firms' investment. While cash flow, size and cash and cash equivalents in the construction industry showed significant and negative coefficients, size and cash and cash equivalents displayed positive coefficients in the retail and wholesale industry. These differences might be attributed to the industry-specific characteristics. Unlike in the retail and wholesale sector, the cost of a project in the construction industry is estimated in advance and unforeseen additional events such as the Covid-19 crisis have a bigger negative impact on the profitability of a venture (Andy Choi 2021). Moreover, higher fixed costs in the industry induce firms to have higher cash holdings as hedging instruments during the crisis (Havan, 2022). In addition, Johnston (2021) reports that e-commerce grew sharply during the pandemic enabling retailers and wholesalers to recoup some of their lost sales during the lockdowns. Since no significant changes in investment were observed, Hypothesis 2, that investment will decline following the Covid-19 crisis, is rejected. Also, Hypothesis 4, stating that investment will increase after the Covid-19 crisis is rejected.

7.3 Interaction Analysis

Regression Model 2) is analyzed to investigate whether the effects of internal and external financing differed during and after the Covid-19 crisis. Two models are constructed: In the first model both financing sources are interacted using the crisis and post-crisis dummy variables. In the second model, all firm-level predictors are added. Table 14a), b) and 15a), b) report the results of the regression for the construction industry and retail and wholesale industry, respectively.

7.3.1 Construction Industry

Table 14a) displays the results of the interaction analysis for the crisis period. In Model 1), it is observed that both funding sources have a significant p-value at $\alpha = 0.05\%$, which is consistent with the previous regressions. No significant interaction coefficients are given for the crisis period, indicating that the effect of the financing sources did not change during the

Covid-19 crisis. The analysis of Table 14b) and the interaction effects of the post-crisis period show a statistically significant and negative interaction coefficient for External Finance * Post-crisis at a $\alpha = 0.10\%$ level. This indicates that the effect of external finance on investment declined significantly during the post-crisis period. External finance became a less important determinant for firms' investment in the post-crisis period. On the other side, no significant change in the effect of internal finance on investment during the post-crisis can be observed. While neither effect gained importance during the crisis, the importance of external financing for business investment decreased after the crisis.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.019	.001		35.551	<.001
	Crisis_	-.001	.001	-.030	-1.164	.245
	Internal Finance 2021	.018	.004	.112	4.940	<.001
	External Finance 2021	.004	.001	.058	2.635	.008
	Internal Finace * Crisis	.001	.008	.002	.076	.940
	External Finace * Crisis	.003	.003	.020	.904	.366
2	(Constant)	.041	.003		12.971	<.001
	Crisis_	-.001	.001	-.023	-.906	.365
	Internal Finance 2021	.053	.012	.324	4.278	<.001
	External Finance 2021	.006	.001	.087	3.933	<.001
	Internal Finace * Crisis	-.001	.008	-.002	-.067	.946
	External Finace * Crisis	.002	.003	.015	.690	.490
	Shareholder equity 2021	.065	.127	.010	.511	.610
	Cashflow 2021	-.023	.010	-.174	-2.321	.020
	Size 2021	-.005	.001	-.127	-6.458	<.001
	Growth 2021	.004	.003	.024	1.223	.222
	Cash and equivalents 2021	-.010	.002	-.123	-5.838	<.001

a. Dependent Variable: Investment

Table 14a) Results from Regression Model 2), Crisis period: Construction Industry

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.019	.001		35.424	<.001
	Post_Crisis	-.001	.001	-.023	-.867	.386
	Internal Finance 2021	.016	.004	.101	4.245	<.001
	External Finance 2021	.007	.002	.104	3.671	<.001
	Internal Finace * Post Crisis	.008	.007	.035	1.148	.251
	External Finance * Post Crisis	-.005	.003	-.054	-1.851	.064
2	(Constant)	.041	.003		12.757	<.001
	Post_Crisis	-.001	.001	-.014	-.521	.603
	Internal Finance 2021	.045	.012	.274	3.610	<.001
	External Finance 2021	.007	.002	.112	3.964	<.001
	Internal Finace * Post Crisis	.008	.007	.035	1.152	.249
	External Finance * Post Crisis	-.005	.003	-.050	-1.709	.088
	Shareholder equity 2021	.092	.128	.014	.719	.472
	Cashflow 2021	-.024	.010	-.179	-2.373	.018
	Size 2021	-.006	.001	-.135	-6.840	<.001
	Growth 2021	.005	.003	.033	1.675	.094

[a.] Dependent Variable: Investment

Table 14b) Results from Regression Model 2), Post- Crisis period: Construction Industry

7.3.2 The Retail and Wholesale Industry

Table 15a) highlights the results of the interaction analysis for the crisis period. Both financing sources display statistically significant results across the periods. Model 1), displays a statistically significant and positive coefficient for the External Finance * Crisis variable, indicating that the effect of external finance on investment increased significantly during the crisis period. Also Model 2), shows the significant results with the same coefficient. No significance is found for the interaction with internal financing, displaying that the crisis did not affect the impact of internal financing on investment. Analyzing Table 15b), the External Finance * Post-Crisis variable shows a significant and negative coefficient in Model 1) and Model 2), showing that the effect of external financing decreased during the post-crisis period. For both models, the variable Internal Finance * Crisis has no significant coefficient, which means that there was no change in the effect.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.020	.000		67.935	.000
	Crisis	-.001	.001	-.024	-1.624	.104
	Internal Finance 2021	.010	.002	.085	5.834	<.001
	External Finance 2021	.003	.001	.040	2.804	.005
	Internal Finace * Crisis	.006	.004	.025	1.527	.127
	External Finace * Crisis	.007	.003	.036	2.517	.012
2	(Constant)	.036	.002		15.728	<.001
	Crisis	-.001	.001	-.023	-1.540	.124
	Internal Finance 2021	.008	.003	.068	2.936	.003
	External Finance 2021	.003	.001	.038	2.616	.009
	Internal Finace * Crisis	.007	.004	.028	1.737	.082
	External Finace * Crisis	.007	.003	.041	2.890	.004
	Shareholder equity 2021	-.171	.140	-.015	-1.222	.222
	Cashflow 2021	.004	.003	.028	1.265	.206
	Size 2021	-.004	.001	-.085	-6.744	<.001
	Growth 2021	.004	.001	.033	2.573	.010
	Cash/equivalents 2021	-.007	.001	-.063	-4.847	<.001

[a] Dependent Variable: Investment

Table 15a) Results from Regression Model 2), Crisis Period: Retail and Wholesale Industry

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.020	.000		66.301	.000
	Post_Crisis	.000	.001	.006	.386	.700
	Internal Finance 2021	.015	.002	.121	6.953	<.001
	External Finance 2021	.006	.001	.080	5.201	<.001
	Internal Finace * Post Crisis	-.005	.003	-.029	-1.502	.133
	External Finance * Post Crisis	-.006	.002	-.035	-2.362	.018
2	(Constant)	.036	.002		15.555	<.001
	Post_Crisis	.001	.001	.024	1.560	.119
	Internal Finance 2021	.014	.003	.114	4.353	<.001
	External Finance 2021	.006	.001	.082	5.049	<.001
	Internal Finace * Post Crisis	-.006	.003	-.034	-1.796	.072
	External Finance * Post Crisis	-.006	.002	-.037	-2.431	.015
	Shareholder equity 2021	-.160	.140	-.014	-1.141	.254
	Cashflow 2021	.003	.003	.020	.887	.375
	Size 2021	-.004	.001	-.085	-6.756	<.001
	Growth 2021	.004	.001	.033	2.597	.009
	Cash/equivalents 2021	-.007	.001	-.063	-4.846	<.001

[a] Dependent Variable: Investment

Table 15b) Results from Regression Model 2), Post-Crisis Period: Retail and Wholesale Industry

7.3.3 Summary

Two somewhat similar results were observed when analyzing the interaction models. In the construction industry, the only coefficient to be significant was External Finance * Post-crisis at a 10% significance level with a negative sign, implying that following the crisis the importance of external financing for firms' investments decreased. All other interaction coefficients showed no significant impact, meaning that besides external financing, the impact of financing sources on investment did not change significantly in the crisis and post-crisis periods. In the retail industry, however, significant coefficients were observed for both periods. The External Finance * Crisis interaction term showed a significantly positive coefficient during the crisis period and a significantly negative coefficient in the post-crisis period. No empirical effect was observed for the internal finance interaction in both periods. These results indicate that the crisis significantly changed the effects of the financing sources for firms in the retail and wholesale industry. Retailers and wholesalers were more dependent on external financing to fund their investments during the Covid-19 period, while this effect diminished after the end of the crisis. Additionally, it can be observed that the increase of the effect size from external financing on investment during the crisis period is larger than the decrease of the similar effect size in the post-crisis period.

Considering the results in conjunction, it can be concluded, that the Covid-19 crisis affected the impact financing sources have on SME investment. According to Myers & Majluf's (1984) pecking order theory, internal financing is the preferred option for companies to finance any expenditure. Only when this source is exhausted are other options considered. However, as no changes in the impact of internal financing on investment were observed in either industry during either period, it can be concluded that internal financing did not become the prevailing source of financing during the crisis. The impact of external financing during the crisis on investment only became larger in the retail sector, while the impact for both sectors decreased in the post-crisis period. This suggests that external finance is particularly important for SMEs that face liquidity shortages but less important when the economy tends to recede to the equilibrium status. In light of these conclusions, Hypothesis 3 that firms become more dependent on internal financing than external financing during the Covid-19 crisis is therefore rejected.

7.4 Additional Regressions

In order to investigate in an alternative way which source of financing – internal or external, has a greater impact on a firm's investment, a separate set of regressions are run for the pre-crisis, crisis and post-crisis periods. The results for the construction industry and the retail and wholesale industry are presented in Table 16a), b), c), and Table 17a), b), c) (See Appendix), respectively. All regressions show significant F-values. Table a represents the pre-crisis period, Table b the crisis period and Table c the post-crisis period.

7.4.1 Construction Industry

For the period before the crisis, a positive and significant relationship can be found between both internal and external financing. Internal financing exhibits the larger coefficient showing a stronger effect on investment. Shareholders' equity shows an insignificant result for all periods, meaning that it is not related to firms' investment. During the crisis period, internal financing is no longer related to investment and only external financing exhibits a positive and significant relationship. These results are in line with the interaction model and strengthen the presumption that external financing becomes the decisive factor defining investment during times of crisis. Examining the period after the crisis, we see that both sources of financing display a positive significant coefficient once again, indicating that internal as well as external finance is related to investment. Cash and cash equivalent are significant across all periods with a negative sign, indicating that firms with higher cash reserves invest less. All other findings are in line with the previous findings.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.046	.004		10.204	<.001
	Internal Finance 2021	.054	.017	.316	3.264	.001
	External Finance 2021	.009	.002	.105	3.777	<.001
	Shareholder equity 2021	.088	.130	.019	.680	.497
	Cashflow 2021	-.026	.014	-.185	-1.915	.056
	Size 2021	-.007	.001	-.153	-5.524	<.001
	Growth 2021	.003	.004	.020	.729	.466
	Cash and equivalents 2021	-.010	.003	-.122	-3.995	<.001

[a.] Dependent Variable: Investment

Table 16a) Results from Regression Model 1), Pre-Crisis Period: Construction Industry

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.036	.006		5.901	<.001
	Internal Finance 2021	.025	.026	.152	.963	.336
	External Finance 2021	.008	.003	.100	2.512	.012
	Shareholder equity 2021	.540	.847	.026	.637	.524
	Cashflow 2021	-.001	.023	-.006	-.038	.970
	Size 2021	-.004	.002	-.107	-2.733	.006
	Growth 2021	.006	.006	.039	.993	.321
	Cash and equivalents 2021	-.009	.003	-.114	-2.740	.006

[a.] Dependent Variable: Investment

Table 16b) Results from Regression Model 1), Crisis Period: Construction Industry

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.036	.007		5.469	<.001
	Internal Finance 2021	.063	.024	.431	2.559	.011
	External Finance 2021	.004	.002	.091	2.039	.042
	Shareholder equity 2021	-1.468	.956	-.063	-1.536	.125
	Cashflow 2021	-.027	.021	-.225	-1.294	.196
	Size 2021	-.004	.002	-.094	-2.388	.017
	Growth 2021	.002	.006	.017	.414	.679
	Cash and equivalents 2021	-.010	.003	-.133	-3.212	.001

[a.] Dependent Variable: Investment

Table 16c) Results from Regression Model 1), Post-Crisis Period: Construction Industry

7.4.2 Retail and Wholesale Industry

During the pre-crisis period, a positive and significant relationship can be found for both internal and external financing with internal financing exhibiting the larger coefficient and showing a stronger effect on investment. Shareholders' equity shows an insignificant result for all periods, meaning that it is not related to firms' investments. As opposed to the construction industry, in the crisis period internal and external financing are both statistically significant with positive coefficients. This suggests that during the Covid-19 crisis, companies in the retail and wholesale sectors utilised internal financing for investments in addition to external financing. Looking at the post-crisis period both financing sources become statistically

insignificant, meaning that investment was related to neither of them. Cash and cash equivalent are significant across all periods with a negative sign, indicating that firms with higher cash reserves invest less. All other findings are in line with the previous conclusions.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.038	.003		11.505	<.001
	Internal Finance 2021	.012	.004	.090	2.836	.005
	External Finance 2021	.005	.001	.068	3.156	.002
	Shareholder equity 2021	-.178	.268	-.012	-.664	.506
	Cashflow 2021	.002	.004	.013	.445	.657
	Size 2021	-.004	.001	-.094	-5.269	<.001
	Growth 2021	.004	.002	.034	1.894	.058
	Cash/equivalents 2021	-.006	.002	-.049	-2.702	.007

[a] Dependent Variable: Investment

Table 17a) Results from Regression Model 1), Pre-Crisis Period: Retail and Wholesale Industry

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.036	.005		8.013	<.001
	Internal Finance 2021	.018	.007	.142	2.610	.009
	External Finance 2021	.011	.002	.123	4.489	<.001
	Shareholder equity 2021	-.208	.190	-.027	-1.094	.274
	Cashflow 2021	.001	.007	.005	.096	.923
	Size 2021	-.004	.001	-.088	-3.508	<.001
	Growth 2021	.003	.003	.029	1.158	.247
	Cash/equivalents 2021	-.009	.003	-.088	-3.355	<.001

[a] Dependent Variable: Investment

Table 17b) Results from Regression Model 1), Crisis Period: Retail and Wholesale Industry

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.033	.005		6.952	<.001
	Internal Finance 2021	.006	.005	.062	1.322	.186
	External Finance 2021	.000	.002	.004	.138	.890
	Shareholder equity 2021	-.021	.317	-.002	-.067	.947
	Cashflow 2021	.005	.005	.048	1.015	.310
	Size 2021	-.003	.001	-.065	-2.543	.011
	Growth 2021	.004	.003	.032	1.241	.215
	Cash/equivalents 2021	-.007	.003	-.065	-2.538	.011

a. Dependent Variable: Investment

Table 17c) Results from Regression Model 1), Post-Crisis Period: Retail and Wholesale Industry

7.4.3 Summary

In summary, for both sectors, both sources of funding were statistically significant and positive in the pre-crisis period. Moreover, for both industries, the internal finance coefficient exhibited a larger coefficient indicating that stronger relationship between internal finance to firms' investment. During the crisis and in the post-crisis period, the results in the two sectors varied. In the construction industry, no significant coefficient could be observed for internal finance but only a positive coefficient for external finance. This indicates that internal financing had no influence on construction firms' investments during the crisis period and that only external financing was essential. In the retail and wholesale industry, both financing sources displayed significant and positive results, meaning that both are related to the firm's investment. In the post-crisis period, no significant coefficients were observed in the retail and wholesale industry but significant and positive values for the construction industry.

Taken together, these findings reinforce the positive relationship between external financing and firms' investment during the crisis period. While in the construction industry internal finance became insignificant during the crisis period, internal finance remained influential in the retail and wholesale industry. It should be noted, however, that the coefficient of external financing in retail and wholesale trade became significantly larger during the crisis, which also indicates the importance of external financing in this industry. It becomes reasonable that SMEs are not willing to jeopardize internal funds when the prospect of the Covid-19 crisis makes investments increasingly uncertain. Usually, SMEs compromise a few larger

shareholders who tend to be risk-averse due to the high concentration of wealth. When facing high uncertainty those shareholders become reluctant to provide new funds unless they are backed by debt financing (Zubair, Kabir & Huang (2020).

8.0 Comparison of Construction Industry and Retail and Wholesale Industry

Analyzing the empirical findings from the previous section certain similarities and differences across the industries were observed. Notably, in both industries no statistical evidence was found, that investment differed significantly during the crisis period. Table 18) and 19) report the retail trade volume and the construction production of entities in the EU.
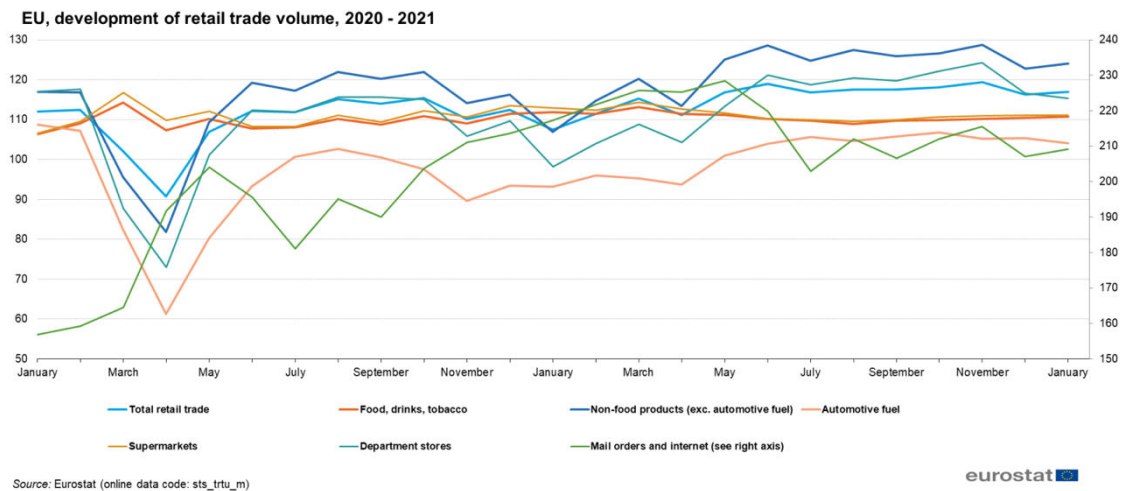

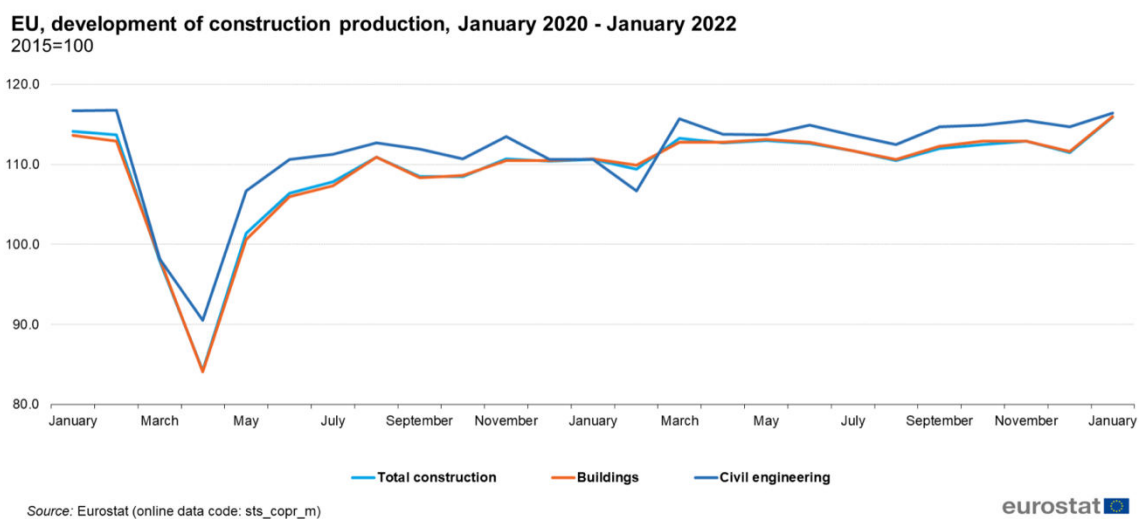*Table 18) Retail trade volume in Europe:2020 -2021*

Table 19) Construction production in Europe: 2020 -2021

It can be observed that both industries exhibiting similar developments during the covid-19 pandemic. Both industries suffered from severe economic breakdowns during March and May 2020 but were able to recover in the succeeding months. While the economic trend in both industries were somehow homogenic the analysis showed, however, that the crisis had a diverse impact on the financing sources. While in both economic sectors external financing lost importance after the Covid-19 crisis, this effect only intensified in the retail and wholesale industry during the crisis. Moreover, the analysis of the respective time periods unveiled that during the crisis internal finance became only insignificant for the construction industry. These discrepancies can be partially explained by industry specific factors. The construction industry, for instance, is determined by high overhead and fixed costs. In particular, SMEs are required to plan projects and investments well in advance to execute them adequately in time (Small and Medium-Sized Enterprises SME, 2021). Consequently, many investments for the construction industry are independent of the current internal income but dependent of previous time periods. Furthermore, supply chains were already compromised before the pandemic with the crisis only exacerbating the problems. Many companies reported that the increase in building material prices, combined with labour shortages and supply chain disruption, were major obstacles to economic growth in the sector (Sketchley, 2021 and Seidu, Ebohon, Young, Udeaja & Fong, 2021), thus alleviating the effect of the availability of internal finance on firms' investment.

In contrast, internal financing for the retail and wholesale industry was consistently significant, indicating the importance for firm's investment. In general, the retail and wholesale industries are characterized by a shorter cash conversion cycle compared to the construction industry (Ernst & Young, 2018), indicating that capital investments are more rapidly converted into cash. This, however, also means that cashflow is a more widely used metric in assessing the quality of the capital expenditures and determining future investments, thus indicating the importance of internal finance on firms' investment. In addition, retailers were able to adapt to the restrictions by introducing in-store hygiene measures and substituting physical sales with a higher online presence. E-commerce usage among consumers increased vastly during the pandemic and it facilitated to cushion the impact of the crisis (Unctad, 2021). In contrast, the constant in both sectors is external financing, which remained significant for both industries, suggesting that external financing was the basic prerequisite for SMEs to invest during this period. This seems reasonable, as SMEs usually have only a few major shareholders (Peruzzi, 2017) who tend to be risk-averse due to their

high concentration of assets (Zhang, 1998). These shareholders are reluctant to risk internal funds without external support when the crisis makes investments increasingly uncertain.

9.0 Robustness Check

9.1 Lagged Dependent Variable

To add robustness to the analysis and confirm the results of the previous section, an additional regression model is carried out. The model incorporates size, growth and cash and cash equivalents as independent firm variables and the lagged investment variable as the dependent variable. The model is modified in the way, that the independent variables of time t predict the dependent variable of t+1. In other words, firm predictors of the crisis period predict investment in the post-crisis period. Following the rationale of the analysis, internal finance should become significant while external finance should lose some of its predictive power. The reasoning followers the line of thought, that in economic equilibrium internal finance is the predictor of investment while external finance dominates in times of crisis. Table 20) and 21) report the results of the analysis for the construction industry and the retail and wholesale industry, respectively.

Coefficients[a,b]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,049	,007		7,348	<,001
	Internal Finance 2021	,028	,008	,149	3,753	<,001
	External Finance 2021	-,003	,003	-,037	-,983	,326
	Size 2021	-,007	,002	-,145	-3,889	<,001
	Growth 2021	,003	,007	,018	,482	,630
	Cash and equivalents 2021	-,012	,004	-,123	-3,088	,002

[a.] Dependent Variable: lag_Investment_1

[b.] Selecting only cases for which Crisis = Crisis

Table 20) Lagged Regression Construction Industry: Crisis Period

Coefficients^{a,b}

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,038	,005		8,320	<,001
	Internal Finance 2021	,009	,003	,068	2,526	,012
	External Finance 2021	,000	,002	,004	,149	,882
	Size 2021	-,004	,001	-,095	-3,746	<,001
	Growth 2021	,005	,003	,043	1,667	,096
	Cash/equivalents 2021	-,006	,003	-,058	-2,232	,026

a. Dependent Variable: lag_Investment

b. Selecting only cases for which Crisis = 1,00

Table 21) Lagged Regression Retail and Wholesale Industry: Crisis Period

Both regressions exhibited a large F-value and a significant p-value at a 5% level. Both analyses show significant p-values at a 5% level for internal finance, size and cash and cash equivalents. Size and cash and cash equivalents display negative coefficients while internal finance shows a positive coefficient. Consequently, firms with internal finance during the crisis period invest more in the post-crisis period. On the other hand, in both industries external finance is insignificant, meaning that investment in the post-crisis cannot be explained by the availability of external financing in the previous period. These findings are in line with the paper's argument and prior analysis, that external financing is critical during economic shocks while internal financing becomes more predictive of firms' investment in economic equilibrium.

9.2 Collinearity Analysis

When analyzing the correlation table of the retail and wholesale dataset, internal finance and cash flow displayed significant concerns for multicollinearity. Table 10) reported the collinearity statistic during the descriptive statistic, whereby both internal finance and cash flow showed values above 10. Following Gujarati, Porter & Gunasekar (2012), this is a sign of multicollinearity concerns. Since only two variables show a significant VIF, further investigation of the relationship is not necessary. To address the problem of multicollinearity, a separate regression without cash flow is performed. Table 22) reports the new coefficients and collinearity statistics for the significant model. It can be observed that the new model shows no signs of critical VIFs, thus no concerns of multicollinearity. Moreover, all predictor

variables exhibit the same significance, values, and signs. The same results are observed for the interaction analysis (see appendix Table 26 and 27). Therefore, it can be concluded that the results of the paper are robust against multicollinearity.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	,036	,002		15,700	<,001		
	Crisis	,000	,001	-,010	-,772	,440	,875	1,143
	Post_Crisis	2,563E-5	,001	,001	,048	,962	,847	1,180
	Internal Finance 2021	,012	,002	,102	7,727	<,001	,909	1,101
	External Finance 2021	,004	,001	,059	4,503	<,001	,927	1,079
	Shareholder equity 2021	-,167	,140	-,015	-1,189	,234	,994	1,006
	Size 2021	-,004	,001	-,084	-6,692	<,001	,991	1,009
	Growth 2021	,004	,001	,034	2,666	,008	,962	1,040
	Cash/equivalents 2021	-,006	,001	-,058	-4,494	<,001	,947	1,056

[a.] Dependent Variable: Investment

Table 22) Collinearity Analysis: Retail and Wholesale Industry

10.0 Limitation of the Study

Although this work enriches the current state of research with information, some limitations must be pointed out.

First, the firm's investment was proxied by the change (increase) in fixed (tangible) assets plus deprecation scaled by total assets at the beginning of the year total assets. Badertscher, Shroff and White (2013) identified three types of business investment, namely capital expenditure, mergers and acquisitions, and research and development. Since capital expenditure, as well as mergers and acquisitions, increase a company's assets, both activities are captured by the investment variable. R&D, however, does not directly affect the assets of an entity and thus is not captured by the investment variable. Therefore, it needs to be mentioned that part of the firm's investment is not captured in this study. This limitation is due to the restricted data availability of the database and could not be prevented. Second, unobservable data, missing variables or outliers were removed to prepare the data for the regression analysis. These changes might affect the models and alter the results. Third, as it is

inherently difficult to track the net cash flow of private SME shareholders due to limited data availability, it was not included in this study, which may have affected the outcome. Fourth, the distribution of sample firms across countries is not homogenous, therefore the results might be biased towards a particular region. Fifth, although only countries that had similar Covid-19 developments were selected for analysis, it must be assumed that each country has unique developments and constraints. Even though the study account for the differences with a fixed-effect model, it can be expected that this influences the study. Finally, the crisis, as well as the post-crisis period, were selected based on the data availability, as the pandemic is still ongoing, future research could define the periods differently and thus produce different results.

11.0 Conclusion and Further Research

In recent years, European economies faced various crises and have constantly been suffering from their repercussions. SMEs, which form the backbone of the economic system, have almost always been at the forefront of the impact. Their inherent characteristics make them intrinsically more vulnerable to economic shocks than larger companies, and previous research has shown that credit constraints exacerbate the impact in times of crisis. Practitioners and policy makers are very apprehensive about the impact of the current Covid-19 crisis and the consequences the extensive restrictions have on European SMEs. This study is one of the first to examine the financing and investment patterns of SMEs during the current pandemic. It investigated whether SMEs reduced their capital expenditures and to what extent internal and external financing influenced this behaviour.

The paper shows that during the research periods, there was no significant reduction in investment in either of the sectors. It notes, however, that the interaction between financing methods and business investment changed during and after the crisis. Investment by companies in the retail and wholesale industry became significantly more dependent on external financing during the crisis, while this effect decreased significantly in both sectors in the post-crisis period. Additionally, internal finance became irrelevant for construction firms' investment during the crisis while it remained consistently significant for the retail and wholesale industry.

These results permit to draw conclusions about the source of financing employed for corporate investments. Whereas internal financing seems to be an important factor in times of economic equilibrium, external financing appeared to be an inevitable driver for SMEs'

investment in times of crisis. Thus, this finding suggests that those investments made by SMEs during the Covid-19 crisis are more determined by the availability of bank financing than by the availability of internal financing. Furthermore, during the analysis cash and cash equivalents always had a statistically significant and negative coefficient, illustrating the logical relationship that companies with higher cash holdings have fewer resources for investment but a hedged position against uncertainty. The other firm-level variables used in the analysis showed the predicted results with none of them being contradictory.

In summary, the results suggest that policymakers should pay particular attention to ensuring the availability of bank credit for SMEs during an economic crisis to alleviate harmful effects on private firms' investment choices. While this study is not without limitation it is the first step towards understanding the consequences of the Covid-19 pandemic. Future research should investigate why internal financing loses influence during a crisis, especially when external financing is expensive and challenging to access. The question arises whether private companies accept the higher costs of external financing to preserve internal funds for unpredictable demands resulting from the shock? Qualitative research that addresses these questions can provide essential insights, as it has the unique advantage of exploring the motivations of the respective companies and their managers. Moreover, this study was to some extent limited by the data availability. Future research should take a more holistic approach and examine how SME's investment will be affected in the coming years. While current government measures are cushioning the immediate effect of the pandemic, it remains to be seen what the long-term impact will be

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7.0 Appendix

7.1 Appendix A – Tables

Table 1a) Group statistic Retail and Wholesale industry (pre-crisis period)

Descriptive Statisitc Retail and Wholesale industry. Pre-crisis period.

	Pre crisis dummy	N	Mean	Std. Deviation	Std. Error Mean
Investment 1 2021	Crisis	1804	.0287073965153	.0281793488403	.0006634568566
	Pre Crisis	3608	.0289343891141	.0424921482498	.0007074168883
Investment 2 2021	Crisis	1804	.0419442050759	.1072999879468	.0025262795504
	Pre Crisis	3608	.0402819452102	.1377239036947	.0022928521951
Investment 3 2021	Crisis	1803	.0287842498075	.0283223258167	.0006670080129
	Pre Crisis	3604	.0289528613468	.0423903283898	.0007061132969
Investment 4 2021	Crisis	1804	.0390311318105	.0985907337486	.0023212281687
	Pre Crisis	3608	.0382443445679	.1273960715474	.0021209125973
Internal Finance 2021	Crisis	1804	.0773039698457	.1294948325988	.0030488367588
	Pre Crisis	3608	.0859600752468	.1293702148360	.0021537784881
External Finance 2021	Crisis	1804	.0066612927814	.2310853895292	.0054406930059
	Pre Crisis	3608	.0401819676706	.2836575469429	.0047223816035
Shareholder equity 2021	Crisis	1804	-.000015236717	.0026027104283	.0000612784238
	Pre Crisis	3608	.0000738045124	.0011675967546	.0000194383597
Cashflow 2021	Crisis	1804	.0980725264603	.1266074765517	.0029808566157
	Pre Crisis	3608	.1085586693583	.1266955051903	.0021092494432
Size 2021	Crisis	1804	3.849235354531	.3583865586427	.0084378819751
	Pre Crisis	3608	3.834182647172	.3568090133460	.0059402203070
Growth 2021	Crisis	1804	.0133814950524	.1723039853348	.0040567388956
	Pre Crisis	3608	.0383933831230	.1723386494631	.0028691246772
Cash/equivalents 2021	Crisis	1804	.1572841558033	.1556775485526	.0036652847301
	Pre Crisis	3608	.1308835655355	.1440578682094	.0023983011699

Table 1b) Group statistic retail and whole industry (post-crisis period)

Descriptive Statistic Retail and Wholesale industry. Post-crisis

	Post crisis dummy	N	Mean	Std. Deviation	Std. Error Mean
Investment 1 2021	Crisis	1804	.0287073965153	.0281793488403	.0006634568566
	Post Crisis	1804	.0287028946994	.0294188359715	.0006926394414
Investment 2 2021	Crisis	1804	.0419442050759	.1072999879468	.0025262795504
	Post Crisis	1804	.0459241400599	.1712998951165	.0040330985147
Investment 3 2021	Crisis	1803	.0287842498075	.0283223258167	.0006670080129
	Post Crisis	1802	.0321672224656	.1554521026484	.0036620073140
Investment 4 2021	Crisis	1804	.0390311318105	.0985907337486	.0023212281687
	Post Crisis	1804	.0371645954963	.0887425512154	.0020893617667
Internal Finance 2021	Crisis	1804	.0773039698457	.1294948325988	.0030488367588
	Post Crisis	1804	.1141231629586	.1789476955840	.0042131589443
External Finance 2021	Crisis	1804	.0066612927814	.2310853895292	.0054406930059
	Post Crisis	1804	.0646419522360	.2318883036811	.0054595968813
Shareholder equity 2021	Crisis	1804	-.000015236717	.0026027104283	.0000612784238
	Post Crisis	1804	.0000788451365	.0014512500774	.0000341683486
Cashflow 2021	Crisis	1804	.0980725264603	.1266074765517	.0029808566157
	Post Crisis	1804	.1398992079857	.1785693725861	.0042042516772
Size 2021	Crisis	1804	3.849235354531	.3583865586427	.0084378819751
	Post Crisis	1804	3.889878053469	.3598330546888	.0084719383944
Growth 2021	Crisis	1804	.0133814950524	.1723039853348	.0040567388956
	Post Crisis	1804	-.006292498965	.2403434676184	.0056586659414
Cash/equivalents 2021	Crisis	1804	.1572841558033	.1556775485526	.0036652847301
	Post Crisis	1804	.1825786742188	.1644514094102	.0038718572161

Table 1c) Country frequency distribution retail and wholesale industry

Country

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Canary Islands (Spain)	3	,0	,0	,0
	France	1886	30,2	30,2	30,3
	Germany	81	1,3	1,3	31,6
	Italy	1216	19,5	19,5	51,1
	Reunion (France)	4	,1	,1	51,2
	Spain	34	,5	,5	51,7
	United Kingdom	3011	48,3	48,3	100,0
	Total	6235	100,0	100,0	

Table 2a) Independent sample t-test retail and whole industry (pre-crisis period)

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference		Lower	Upper
Investment 1 2021	Equal variances assumed	.065	.799	-.205	5410	.837	-.000226992599	.0011049962121		-.002393230022	.0019392448246
	Equal variances not assumed			-.234	5001.624	.815	-.000226992599	.0009698523879		-.002128328460	.0016743432625
Investment 2 2021	Equal variances assumed	.510	.475	.449	5410	.653	.0016622598657	.0037021302610		-.005595405844	.0089199255752
	Equal variances not assumed			.487	4477.982	.626	.0016622598657	.0034116359060		-.005026231479	.0083507512101
Investment 3 2021	Equal variances assumed	.042	.837	-.153	5405	.879	-.000168611539	.0011042025197		-.002333293454	.0019960703754
	Equal variances not assumed			-.174	4977.552	.862	-.000168611539	.0009713370565		-.002072860231	.0017356371522
Investment 4 2021	Equal variances assumed	.503	.478	.230	5410	.818	.0007867872426	.0034191993352		-.005916219950	.0074897944356
	Equal variances not assumed			.250	4501.753	.802	.0007867872426	.0031442599219		-.005377506319	.0069510808040
Internal Finance 2021	Equal variances assumed	.019	.890	-2.320	5410	.020	-.008656105401	.0037316517375		-.015971645089	-.001340565713
	Equal variances not assumed			-2.319	3603.026	.020	-.008656105401	.0037328497636		-.015974815058	-.001337395744
External Finance 2021	Equal variances assumed	.414	.520	-4.349	5410	<.001	-.033520674889	.0077073816949		-.048630245837	-.018411103941
	Equal variances not assumed			-4.653	4317.974	<.001	-.033520674889	.0072043062396		-.047644814749	-.019396535029
Shareholder equity 2021	Equal variances assumed	.174	.677	-1.735	5410	.083	-.000089041229	.0000513122311		-.000189633859	.0000115514012
	Equal variances not assumed			-1.385	2173.109	.166	-.000089041229	.0000642875964		-.000215112820	.0000370303625
Cashflow 2021	Equal variances assumed	.001	.980	-2.871	5410	.004	-.010486142898	.0036524814376		-.017646476926	-.003325808870
	Equal variances not assumed			-2.872	3608.340	.004	-.010486142898	.0036516351649		-.017645617833	-.003326667963
Size 2021	Equal variances assumed	.057	.811	1.461	5410	.144	.0150527073593	.0103039459870		-.005147174922	.0352525896404
	Equal variances not assumed			1.459	3592.003	.145	.0150527073593	.0103191118572		-.005179197555	.0352846122738
Growth 2021	Equal variances assumed	.095	.758	-5.033	5410	<.001	-.025011888071	.0049691366123		-.034753396298	-.015270379843
	Equal variances not assumed			-5.034	3606.756	<.001	-.025011888071	.0049688033650		-.034753832921	-.015269943220
Cash/equivalents 2021	Equal variances assumed	20.565	<.001	6.185	5410	<.001	.0264005902678	.0042685682200		.0180324781231	.0347687024126
	Equal variances not assumed			6.027	3368.728	<.001	.0264005902678	.0043802009833		.0178124684510	.0349887120846

Table 2b) Effect sizes independent sample t-test retail and wholesale industry (pre-crisis period)

Independent Samples Effect Sizes

		Standardizer[a]	Point Estimate	95% Confidence Interval	
				Lower	Upper
Investment 1 2021	Cohen's d	.0383206993529	-.006	-.062	.051
	Hedges' correction	.0383260128573	-.006	-.062	.051
	Glass's delta	.0424921482498	-.005	-.062	.051
Investment 2 2021	Cohen's d	.1283879701509	.013	-.044	.069
	Hedges' correction	.1284057722800	.013	-.044	.069
	Glass's delta	.1377239036947	.012	-.044	.069
Investment 3 2021	Cohen's d	.0382790193730	-.004	-.061	.052
	Hedges' correction	.0382843320093	-.004	-.061	.052
	Glass's delta	.0423903283898	-.004	-.061	.053
Investment 4 2021	Cohen's d	.1185760714065	.007	-.050	.063
	Hedges' correction	.1185925130289	.007	-.050	.063
	Glass's delta	.1273960715474	.006	-.050	.063
Internal Finance 2021	Cohen's d	.1294117597442	-.067	-.123	-.010
	Hedges' correction	.1294297038308	-.067	-.123	-.010
	Glass's delta	.1293702148360	-.067	-.123	-.010
External Finance 2021	Cohen's d	.2672880264119	-.125	-.182	-.069
	Hedges' correction	.2673250882640	-.125	-.182	-.069
	Glass's delta	.2836575469429	-.118	-.175	-.062
Shareholder equity 2021	Cohen's d	.0017794817396	-.050	-.107	.006
	Hedges' correction	.0017797284805	-.050	-.107	.006
	Glass's delta	.0011675967546	-.076	-.133	-.020
Cashflow 2021	Cohen's d	.1266661745314	-.083	-.139	-.026
	Hedges' correction	.1266837379183	-.083	-.139	-.026
	Glass's delta	.1266955051903	-.083	-.139	-.026
Size 2021	Cohen's d	.3573355383371	.042	-.014	.099
	Hedges' correction	.3573850860742	.042	-.014	.099
	Glass's delta	.3568090133460	.042	-.014	.099
Growth 2021	Cohen's d	.1723270976642	-.145	-.202	-.089
	Hedges' correction	.1723509923424	-.145	-.202	-.089
	Glass's delta	.1723386494631	-.145	-.202	-.089
Cash/equivalents 2021	Cohen's d	.1480317467450	.178	.122	.235
	Hedges' correction	.1480522726577	.178	.122	.235
	Glass's delta	.1440578682094	.183	.127	.240

[a] The denominator used in estimating the effect sizes.

Cohen's d uses the pooled standard deviation.

Hedges' correction uses the pooled standard deviation, plus a correction factor.

Glass's delta uses the sample standard deviation of the control group.

Table 3a) Independent sample t-test Retail and Whole industry (post-crisis period)

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference		Lower	Upper
Investment 1 2021	Equal variances assumed	.022	.882	.005	3606	.996	.0000045018159	.0009591268927		-.001875983537	.0018849871691
	Equal variances not assumed			.005	3599.339	.996	.0000045018159	.0009591268927		-.001875984706	.0018849883376
Investment 2 2021	Equal variances assumed	1.181	.277	-.836	3606	.403	-.003979934984	.0047589885476		-.013310512959	.0053506429905
	Equal variances not assumed			-.836	3029.098	.403	-.003979934984	.0047589885476		-.013311109659	.0053512396905
Investment 3 2021	Equal variances assumed	1.438	.231	-.909	3603	.363	-.003382972658	.0037212906880		-.010679019348	.0039130740313
	Equal variances not assumed			-.909	1920.370	.364	-.003382972658	.0037222570112		-.010683063370	.0039171180541
Investment 4 2021	Equal variances assumed	.330	.566	.598	3606	.550	.0018665363142	.0031230646492		-.004256613161	.0079896857898
	Equal variances not assumed			.598	3566.788	.550	.0018665363142	.0031230646492		-.004256635764	.0079897083921
Internal Finance 2021	Equal variances assumed	33.004	<.001	-7.080	3606	<.001	-.036819193113	.0052005878391		-.047015580404	-.026622805822
	Equal variances not assumed			-7.080	3284.947	<.001	-.036819193113	.0052005878391		-.047015915015	-.026622471211
External Finance 2021	Equal variances assumed	8.776	.003	-7.522	3606	<.001	-.057980659455	.0077076804871		-.073092507922	-.042868810987
	Equal variances not assumed			-7.522	3605.957	<.001	-.057980659455	.0077076804871		-.073092507983	-.042868810926
Shareholder equity 2021	Equal variances assumed	.034	.853	-1.341	3606	.180	-.000094081853	.0000701606818		-.000231640434	.0000434767280
	Equal variances not assumed			-1.341	2825.315	.180	-.000094081853	.0000701606818		-.000231653198	.0000434894914
Cashflow 2021	Equal variances assumed	49.383	<.001	-8.116	3606	<.001	-.041826681525	.0051537596305		-.051931256397	-.031722106653
	Equal variances not assumed			-8.116	3250.047	<.001	-.041826681525	.0051537596305		-.051931627991	-.031721735059
Size 2021	Equal variances assumed	.129	.719	-3.399	3606	<.001	-.040642698938	.0119570729020		-.064085999956	-.017199397920
	Equal variances not assumed			-3.399	3605.941	<.001	-.040642698938	.0119570729020		-.064086000083	-.017199397793
Growth 2021	Equal variances assumed	1.983	.159	2.826	3606	.005	.0196739940173	.0069625879315		.0060229904585	.0333249975762
	Equal variances not assumed			2.826	3269.064	.005	.0196739940173	.0069625879315		.0060225180310	.0333254700037
Cash/equivalents 2021	Equal variances assumed	7.800	.005	-4.744	3606	<.001	-.025294518416	.0053315654788		-.035747703358	-.014841333473
	Equal variances not assumed			-4.744	3595.214	<.001	-.025294518416	.0053315654788		-.035747713888	-.014841322943

Table 3b) Effect sizes independent sample t-test retail and wholesale industry (post-crisis period)

Independent Samples Effect Sizes

		Standardizer[a]	Point Estimate	95% Confidence Interval	
				Lower	Upper
Investment 1 2021	Cohen's d	.0288057599360	.000	-.065	.065
	Hedges' correction	.0288117528818	.000	-.065	.065
	Glass's delta	.0294188359715	.000	-.065	.065
Investment 2 2021	Cohen's d	.1429282013465	-.028	-.093	.037
	Hedges' correction	.1429579370997	-.028	-.093	.037
	Glass's delta	.1712998951165	-.023	-.088	.042
Investment 3 2021	Cohen's d	.1117162163313	-.030	-.096	.035
	Hedges' correction	.1117394778892	-.030	-.096	.035
	Glass's delta	.1554521026484	-.022	-.087	.044
Investment 4 2021	Cohen's d	.0937959838620	.020	-.045	.085
	Hedges' correction	.0938154978152	.020	-.045	.085
	Glass's delta	.0887425512154	.021	-.044	.086
Internal Finance 2021	Cohen's d	.1561908918993	-.236	-.301	-.170
	Hedges' correction	.1562233869126	-.236	-.301	-.170
	Glass's delta	.1789476955840	-.206	-.271	-.140
External Finance 2021	Cohen's d	.2314871947192	-.250	-.316	-.185
	Hedges' correction	.2315353548865	-.250	-.316	-.185
	Glass's delta	.2318883036811	-.250	-.316	-.184
Shareholder equity 2021	Cohen's d	.0021071578442	-.045	-.110	.021
	Hedges' correction	.0021075962316	-.045	-.110	.021
	Glass's delta	.0014512500774	-.065	-.130	.000
Cashflow 2021	Cohen's d	.1547844855671	-.270	-.336	-.205
	Hedges' correction	.1548166879821	-.270	-.336	-.205
	Glass's delta	.1785693725861	-.234	-.300	-.168
Size 2021	Cohen's d	.3591105349766	-.113	-.178	-.048
	Hedges' correction	.3591852467698	-.113	-.178	-.048
	Glass's delta	.3598330546888	-.113	-.178	-.048
Growth 2021	Cohen's d	.2091095954148	.094	.029	.159
	Hedges' correction	.2091530999944	.094	.029	.159
	Glass's delta	.2403434676184	.082	.017	.147
Cash/equivalents 2021	Cohen's d	.1601245845901	-.158	-.223	-.093
	Hedges' correction	.1601578979956	-.158	-.223	-.093
	Glass's delta	.1644514094102	-.154	-.219	-.088

[a] The denominator used in estimating the effect sizes.

Cohen's d uses the pooled standard deviation.

Hedges' correction uses the pooled standard deviation, plus a correction factor.

Glass's delta uses the sample standard deviation of the control group.

Table 4) Correlation matrix for the Retail and Wholesale industry

Correlations

		Investment 1 2021	Investment 2 2021	Investment 3 2021	Investment 4 2021	Internal Finance 2021	External Finance 2021	Shareholder equity 2021	Cashflow 2021	Size 2021	Growth 2021	Cash/equivalents 2021
Investment 1 2021	Pearson Correlation	1	.491**	.423**	.613**	.094**	.208**	.091**	.091**	−.099**	.032**	−.034**
	Sig. (2-tailed)		.000	.000	.000	<.001	<.001	<.001	<.001	<.001	.007	.004
	N	7216	7216	7209	7216	7216	7216	7216	7216	7216	7216	7216
Investment 2 2021	Pearson Correlation	.491**	1	.203**	.781**	.069**	.360**	.104**	.061**	.038**	.096**	−.060**
	Sig. (2-tailed)	.000		<.001	.000	<.001	<.001	<.001	<.001	.001	<.001	<.001
	N	7216	7216	7209	7216	7216	7216	7216	7216	7216	7216	7216
Investment 3 2021	Pearson Correlation	.423**	.203**	1	.263**	.033**	.097**	.039**	.031**	−.047**	.014	−.023*
	Sig. (2-tailed)	.000	<.001		<.001	.006	<.001	.001	.009	<.001	.230	.046
	N	7209	7209	7209	7209	7209	7209	7209	7209	7209	7209	7209
Investment 4 2021	Pearson Correlation	.613**	.781**	.263**	1	.060**	.341**	.125**	.063**	.012	.105**	−.056**
	Sig. (2-tailed)	.000	.000	<.001		<.001	<.001	<.001	<.001	.298	<.001	<.001
	N	7216	7216	7209	7216	7216	7216	7216	7216	7216	7216	7216
Internal Finance 2021	Pearson Correlation	.094**	.069**	.033**	.060**	1	−.158**	.037**	.835**	−.004	.058**	.164**
	Sig. (2-tailed)	<.001	<.001	.006	<.001		<.001	.002	.000	.734	<.001	<.001
	N	7216	7216	7209	7216	7216	7216	7216	7216	7216	7216	7216
External Finance 2021	Pearson Correlation	.208**	.360**	.097**	.341**	−.158**	1	.075**	−.022	.047**	.129**	.008
	Sig. (2-tailed)	<.001	<.001	<.001	<.001	<.001		<.001	.066	<.001	<.001	.510
	N	7216	7216	7209	7216	7216	7216	7216	7216	7216	7216	7216
Shareholder equity 2021	Pearson Correlation	.091**	.104**	.039**	.125**	.037**	.075**	1	.037**	−.064**	.016	.023
	Sig. (2-tailed)	<.001	<.001	.001	<.001	.002	<.001		.002	<.001	.165	.055
	N	7216	7216	7209	7216	7216	7216	7216	7216	7216	7216	7216
Cashflow 2021	Pearson Correlation	.091**	.061**	.031**	.063**	.835**	−.022	.037**	1	−.013	.064**	.202**
	Sig. (2-tailed)	<.001	<.001	.009	<.001	.000	.066	.002		.278	<.001	<.001
	N	7216	7216	7209	7216	7216	7216	7216	7216	7216	7216	7216
Size 2021	Pearson Correlation	−.099**	.038**	−.047**	.012	−.004	.047**	−.064**	−.013	1	.020	−.053**
	Sig. (2-tailed)	<.001	.001	<.001	.298	.734	<.001	<.001	.278		.084	<.001
	N	7216	7216	7209	7216	7216	7216	7216	7216	7216	7216	7216
Growth 2021	Pearson Correlation	.032**	.096**	.014	.105**	.058**	.129**	.016	.064**	.020	1	−.008
	Sig. (2-tailed)	.007	<.001	.230	<.001	<.001	<.001	.165	<.001	.084		.507
	N	7216	7216	7209	7216	7216	7216	7216	7216	7216	7216	7216
Cash/equivalents 2021	Pearson Correlation	−.034**	−.060**	−.023*	−.056**	.164**	.008	.023	.202**	−.053**	−.008	1
	Sig. (2-tailed)	.004	<.001	.046	<.001	<.001	.510	.055	<.001	<.001	.507	
	N	7216	7216	7209	7216	7216	7216	7216	7216	7216	7216	7216

. Correlation is significant at the 0.01 level (2-tailed).

*.** Correlation is significant at the 0.05 level (2-tailed).

Table 6a) Group statistic Construction Industry (pre-crisis period)

Group Statistics

	Pre crisis dummy	N	Mean	Std. Deviation	Std. Error Mean
Investment 1 2021	Crisis	796	.0304188746029	.0324721562912	.0011509450640
	Pre Crisis	1592	.0315741729477	.0336909695362	.0008443878534
Investment 2 2021	Crisis	796	.0359334959201	.0723511867760	.0025644198233
	Pre Crisis	1592	.0364273770536	.0795464301342	.0019936511270
Investment 3 2021	Crisis	796	.0304107072163	.0324764979819	.0011510989512
	Pre Crisis	1591	.0315980410984	.0337198295028	.0008453767125
Investment 4 2021	Crisis	796	.0328728615689	.0649503874965	.0023021054477
	Pre Crisis	1592	.0364343689482	.0725489490141	.0018182751095
Internal Finance 2021	Crisis	796	.0952273674198	.1086633781379	.0038514713217
	Pre Crisis	1592	.1106439158560	.1088086230375	.0027270417236
External Finance 2021	Crisis	796	.0108927088785	.2076886400827	.0073613286724
	Pre Crisis	1592	.0409764513465	.2064223490599	.0051735087060
Shareholder equity 2021	Crisis	796	.0000008046786	.0007132153331	.0000252792472
	Pre Crisis	1592	.0000799745156	.0037964103210	.0000951484272
Cashflow 2021	Crisis	796	.1138463283487	.1233487253045	.0043719796515
	Pre Crisis	1592	.1352703340315	.1283189655916	.0032160242758
Size 2021	Crisis	796	3.806007259251	.4076446981307	.0144485832413
	Pre Crisis	1592	3.786598243974	.4109440179700	.0102993811685
Growth 2021	Crisis	796	.0172005019762	.1730228424659	.0061326320531
	Pre Crisis	1592	.0308897000632	.1486378176127	.0037252702867
Cash and equivalents 2021	Crisis	796	.2321298325219	.1973298873300	.0069941724157
	Pre Crisis	1592	.2049977799416	.1971309708043	.0049406413517

Table 6b) Group statistic construction industry (post-crisis period)

Group Statistics

	Post crisis dummy	N	Mean	Std. Deviation	Std. Error Mean
Investment 1 2021	Crisis	796	.0304188746029	.0324721562912	.0011509450640
	Post Crisis	796	.0304897576091	.0315333723032	.0011176707478
Investment 2 2021	Crisis	796	.0359334959201	.0723511867760	.0025644198233
	Post Crisis	796	.0483542925779	.1005730212870	.0035647162261
Investment 3 2021	Crisis	796	.0304107072163	.0324764979819	.0011510989512
	Post Crisis	796	.0304968824908	.0315129413660	.0011169465924
Investment 4 2021	Crisis	796	.0328728615689	.0649503874965	.0023021054477
	Post Crisis	796	.0448876251370	.0957440464884	.0033935577524
Internal Finance 2021	Crisis	796	.0952273674198	.1086633781379	.0038514713217
	Post Crisis	796	.1208111264374	.1582306857407	.0056083379589
External Finance 2021	Crisis	796	.0108927088785	.2076886400827	.0073613286724
	Post Crisis	796	.1263485041816	.3921894240731	.0139007855764
Shareholder equity 2021	Crisis	796	.0000008046786	.0007132153331	.0000252792472
	Post Crisis	796	.0000325609241	.0007357785055	.0000260789777
Cashflow 2021	Crisis	796	.1138463283487	.1233487253045	.0043719796515
	Post Crisis	796	.1454114112029	.1943091026706	.0068871035423
Size 2021	Crisis	796	3.806007259251	.4076446981307	.0144485832413
	Post Crisis	796	3.862942446369	.4081842208422	.0144677061168
Growth 2021	Crisis	796	.0172005019762	.1730228424659	.0061326320531
	Post Crisis	796	.0019431940892	.1708097045265	.0060541894586
Cash and equivalents 2021	Crisis	796	.2321298325219	.1973298873300	.0069941724157
	Post Crisis	796	.2796970002009	.2327811908698	.0082507105544

Table 6c) Country frequency distribution construction industry

Country

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	France	752	27,6	27,6	27,6
	Germany	9	,3	,3	27,9
	Italy	355	13,0	13,0	40,9
	Spain	11	,4	,4	41,3
	United Kingdom	1601	58,7	58,7	100,0
	Total	2728	100,0	100,0	

Table 7a) Independent sample t-test construction industry (pre-crisis period)

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Investment 1 2021	Equal variances assumed	.214	.644	-.799	2386	.424	-.001155298345	.0014451090594	-.003989097566	.0016785008762
	Equal variances not assumed			-.809	1643.237	.418	-.001155298345	.0014274681739	-.003955146822	.0016645501325
Investment 2 2021	Equal variances assumed	.017	.895	-.147	2386	.883	-.000493881134	.0033522681688	-.007067540653	.0060797783861
	Equal variances not assumed			-.152	1730.520	.879	-.000493881134	.0032482139471	-.006864719339	.0058769570722
Investment 3 2021	Equal variances assumed	.242	.623	-.821	2385	.412	-.001187333882	.0014461598219	-.004023194208	.0016485264441
	Equal variances not assumed			-.831	1644.630	.406	-.001187333882	.0014281773635	-.003988571622	.0016139038580
Investment 4 2021	Equal variances assumed	.058	.810	-1.170	2386	.242	-.003561507379	.0030434139627	-.009529516548	.0024065017896
	Equal variances not assumed			-1.214	1755.003	.225	-.003561507379	.0029335667482	-.009315160600	.0021921458414
Internal Finance 2021	Equal variances assumed	.050	.824	-3.265	2386	.001	-.015416548436	.0047212749455	-.024674773741	-.006158323131
	Equal variances not assumed			-3.267	1592.001	.001	-.015416548436	.0047191723750	-.024672993716	-.006160103157
External Finance 2021	Equal variances assumed	.068	.795	-3.350	2386	<.001	-.030083742468	.0089791328381	-.047691451364	-.012476033572
	Equal variances not assumed			-3.344	1581.494	<.001	-.030083742468	.0089974636512	-.047731953703	-.012435531233
Shareholder equity 2021	Equal variances assumed	2.191	.139	-.583	2386	.560	-.000079169837	.0001357557621	-.000345381283	.0001870416094
	Equal variances not assumed			-.804	1805.532	.421	-.000079169837	.0000984492942	-.000272256345	.0001139166709
Cashflow 2021	Equal variances assumed	.775	.379	-3.896	2386	<.001	-.021424005683	.0054993687475	-.032208040819	-.010639970546
	Equal variances not assumed			-3.947	1647.144	<.001	-.021424005683	.0054274320093	-.032069399364	-.010778612001
Size 2021	Equal variances assumed	.010	.920	1.091	2386	.275	.0194090152765	.0177914584775	-.015479300484	.0542973310375
	Equal variances not assumed			1.094	1601.559	.274	.0194090152765	.0177436977582	-.015394295254	.0542123258071
Growth 2021	Equal variances assumed	.145	.703	-2.006	2386	.045	-.013689198087	.0068233276652	-.027069462017	-.000308934157
	Equal variances not assumed			-1.908	1395.036	.057	-.013689198087	.0071754313185	-.027764997340	.0003866011660
Cash and equivalents 2021	Equal variances assumed	.023	.880	3.170	2386	.002	.0271320525803	.0085603199220	.0103456185266	.0439184866339
	Equal variances not assumed			3.168	1588.686	.002	.0271320525803	.0085631994457	.0103356936785	.0439284114820

Table 7b) Effect sizes independent sample t-test construction industry (pre-crisis period)

Independent Samples Effect Sizes

		Standardizer[a]	Point Estimate	95% Confidence Interval	
				Lower	Upper
Investment 1 2021	Cohen's d	.0332898262143	-.035	-.120	.050
	Hedges' correction	.0333002948960	-.035	-.120	.050
	Glass's delta	.0336909695362	-.034	-.119	.051
Investment 2 2021	Cohen's d	.0772235313574	-.006	-.091	.079
	Hedges' correction	.0772478159110	-.006	-.091	.079
	Glass's delta	.0795464301342	-.006	-.091	.079
Investment 3 2021	Cohen's d	.0333105424982	-.036	-.121	.049
	Hedges' correction	.0333210220886	-.036	-.121	.049
	Glass's delta	.0337198295028	-.035	-.120	.050
Investment 4 2021	Cohen's d	.0701087030464	-.051	-.136	.034
	Hedges' correction	.0701307501935	-.051	-.136	.034
	Glass's delta	.0725489490141	-.049	-.134	.036
Internal Finance 2021	Cohen's d	.1087602499098	-.142	-.227	-.057
	Hedges' correction	.1087944518437	-.142	-.227	-.057
	Glass's delta	.1088086230375	-.142	-.227	-.056
External Finance 2021	Cohen's d	.2068451303322	-.145	-.231	-.060
	Hedges' correction	.2069101771070	-.145	-.231	-.060
	Glass's delta	.2064223490599	-.146	-.231	-.060
Shareholder equity 2021	Cohen's d	.0031272973482	-.025	-.110	.060
	Hedges' correction	.0031282807922	-.025	-.110	.060
	Glass's delta	.0037964103210	-.021	-.106	.064
Cashflow 2021	Cohen's d	.1266845769886	-.169	-.254	-.084
	Hedges' correction	.1267244156019	-.169	-.254	-.084
	Glass's delta	.1283189655916	-.167	-.252	-.082
Size 2021	Cohen's d	.4098476561094	.047	-.038	.132
	Hedges' correction	.4099765412718	.047	-.038	.132
	Glass's delta	.4109440179700	.047	-.038	.132
Growth 2021	Cohen's d	.1571835638972	-.087	-.172	-.002
	Hedges' correction	.1572329935544	-.087	-.172	-.002
	Glass's delta	.1486378176127	-.092	-.177	-.007
Cash and equivalents 2021	Cohen's d	.1971972708133	.138	.052	.223
	Hedges' correction	.1972592836170	.138	.052	.223
	Glass's delta	.1971309708043	.138	.052	.223

[a] The denominator used in estimating the effect sizes.

Cohen's d uses the pooled standard deviation.

Hedges' correction uses the pooled standard deviation, plus a correction factor.

Glass's delta uses the sample standard deviation of the control group.

Table 8a) Independent sample t-test construction industry (post-crisis period)

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Investment 1 2021	Equal variances assumed	,081	,776	,044	1590	,965	.0000708830062	.0016043261641	-.003075933933	.0032176999453
	Equal variances not assumed			,044	1588,634	,965	.0000708830062	.0016043261641	-.003075935995	.0032177020073
Investment 2 2021	Equal variances assumed	10,496	,001	2,829	1590	,005	.0124207966578	.0043912926118	.0038074646033	.0210341287123
	Equal variances not assumed			2,829	1444,030	,005	.0124207966578	.0043912926118	.0038068012744	.0210347920412
Investment 3 2021	Equal variances assumed	,103	,749	,054	1590	,957	.0000861752745	.0016039321949	-.003059868911	.0032322194598
	Equal variances not assumed			,054	1588,560	,957	.0000861752745	.0016039321949	-.003059871084	.0032322216325
Investment 4 2021	Equal variances assumed	9,163	,003	2,930	1590	,003	.0120147635681	.0041007223401	.0039713726348	.0200581545013
	Equal variances not assumed			2,930	1398,829	,003	.0120147635681	.0041007223401	.0039705351466	.0200589919895
Internal Finance 2021	Equal variances assumed	8,301	,004	3,760	1590	<,001	.0255837590176	.0068034760235	.0122390326930	.0389284853422
	Equal variances not assumed			3,760	1408,426	<,001	.0255837590176	.0068034760235	.0122377219760	.0389297960592
External Finance 2021	Equal variances assumed	15,168	<,001	7,340	1590	<,001	.1154557953031	.0157296217203	.0846028171606	.1463087734456
	Equal variances not assumed			7,340	1208,383	<,001	.1154557953031	.0157296217203	.0845953927611	.1463161978450
Shareholder equity 2021	Equal variances assumed	,322	,571	,874	1590	,382	.0000317562455	.0000363201517	-.000039484174	.0001029966647
	Equal variances not assumed			,874	1588,460	,382	.0000317562455	.0000363201517	-.000039484226	.0001029967173
Cashflow 2021	Equal variances assumed	12,355	<,001	3,869	1590	<,001	.0315650828542	.0081575977637	.0155643048333	.0475658608751
	Equal variances not assumed			3,869	1346,223	<,001	.0315650828542	.0081575977637	.0155620972654	.0475680684430
Size 2021	Equal variances assumed	,002	,967	2,785	1590	,005	.0569351871176	.0204469087630	.0168294528309	.0970409214044
	Equal variances not assumed			2,785	1589,997	,005	.0569351871176	.0204469087630	.0168294527774	.0970409214578
Growth 2021	Equal variances assumed	,567	,452	-1,770	1590	,077	-.015257307887	.0086175626426	-.032160287283	.0016456715094
	Equal variances not assumed			-1,770	1589,737	,077	-.015257307887	.0086175626426	-.032160289417	.0016456736432
Cash and equivalents 2021	Equal variances assumed	11,876	<,001	4,398	1590	<,001	.0475671676790	.0108163151042	.0263514296642	.0687829056939
	Equal variances not assumed			4,398	1548,486	<,001	.0475671676790	.0108163151042	.0263509963654	.0687833389927
Change in Cash and equivalents 2021	Equal variances assumed	3,585	,058	,956	1590	,339	.0780836121403	.0816733175587	-.082115096148	.2382823204287
	Equal variances not assumed			,956	798,155	,339	.0780836121403	.0816733175587	-.082236259950	.2384034842310

Table 8b) Effect sizes independent sample t-test construction industry (post-crisis period)

Independent Samples Effect Sizes

		Standardizer[a]	Point Estimate	95% Confidence Interval	
				Lower	Upper
Investment 1 2021	Cohen's d	.0320062064529	,002	-,096	,100
	Hedges' correction	.0320213136174	,002	-,096	,100
	Glass's delta	.0324721562912	,002	-,096	,100
Investment 2 2021	Cohen's d	.0876060124611	,142	,043	,240
	Hedges' correction	.0876473631424	,142	,043	,240
	Glass's delta	.0723511867760	,172	,073	,270
Investment 3 2021	Cohen's d	.0319983467909	,003	-,096	,101
	Hedges' correction	.0320134502456	,003	-,096	,101
	Glass's delta	.0324764979819	,003	-,096	,101
Investment 4 2021	Cohen's d	.0818091537480	,147	,048	,245
	Hedges' correction	.0818477682693	,147	,048	,245
	Glass's delta	.0649503874965	,185	,086	,284
Internal Finance 2021	Cohen's d	.1357289203860	,188	,090	,287
	Hedges' correction	.1357929854332	,188	,090	,287
	Glass's delta	.1086633781379	,235	,136	,334
External Finance 2021	Cohen's d	.3138049677540	,368	,269	,467
	Hedges' correction	.3139530860034	,368	,269	,467
	Glass's delta	.2076886400827	,556	,454	,658
Shareholder equity 2021	Cohen's d	.0007245847502	,044	-,054	,142
	Hedges' correction	.0007249267595	,044	-,054	,142
	Glass's delta	.0007132153331	,045	-,054	,143
Cashflow 2021	Cohen's d	.1627435642581	,194	,095	,292
	Hedges' correction	.1628203804156	,194	,095	,292
	Glass's delta	.1233487253045	,256	,157	,355
Size 2021	Cohen's d	.4079145486855	,140	,041	,238
	Hedges' correction	.4081070873482	,140	,041	,238
	Glass's delta	.4076446981307	,140	,041	,238
Growth 2021	Cohen's d	.1719198347710	-,089	-,187	,010
	Hedges' correction	.1720009821956	-,089	-,187	,010
	Glass's delta	.1730228424659	-,088	-,186	,010
Cash and equivalents 2021	Cohen's d	.2157848086132	,220	,122	,319
	Hedges' correction	.2158866606276	,220	,122	,319
	Glass's delta	.1973298873300	,241	,142	,340
Change in Cash and equivalents 2021	Cohen's d	1.629377567913	,048	-,050	,146
	Hedges' correction	1.630146646091	,048	-,050	,146
	Glass's delta	.1025439932466	,761	,656	,866

[a] The denominator used in estimating the effect sizes.

Cohen's d uses the pooled standard deviation.

Hedges' correction uses the pooled standard deviation, plus a correction factor.

Glass's delta uses the sample standard deviation of the control group.

Table 9) Correlation matrix for the construction industry

Correlations

		Investment 1 2021	Investment 2 2021	Investment 3 2021	Investment 4 2021	Internal Finance 2021	External Finance 2021	Shareholder equity 2021	Cashflow 2021	Size 2021	Growth 2021	Cash and equivalents 2021
Investment 1 2021	Pearson Correlation	1	.462**	1.000**	.500**	.248**	.032	.047**	.212**	.011	.003	−.140**
	Sig. (2–tailed)		<.001	.000	<.001	<.001	.070	.009	<.001	.530	.867	<.001
	N		3184	3183	3184	3184	3184	3184	3184	3184	3184	3184
Investment 2 2021	Pearson Correlation	.462**	1	.463**	.919**	.219**	.164**	.092**	.206**	.001	.064**	−.059**
	Sig. (2–tailed)	<.001		<.001	.000	<.001	<.001	<.001	<.001	.967	<.001	<.001
	N	3184	3184	3183	3184	3184	3184	3184	3184	3184	3184	3184
Investment 3 2021	Pearson Correlation	1.000**	.463**	1	.503**	.250**	.034	.040*	.213**	.011	.004	−.139**
	Sig. (2–tailed)	.000	<.001		<.001	<.001	.055	.024	<.001	.544	.838	<.001
	N	3183	3183	3183	3183	3183	3183	3183	3183	3183	3183	3183
Investment 4 2021	Pearson Correlation	.500**	.919**	.503**	1	.208**	.154**	.086**	.200**	−.011	.071**	−.066**
	Sig. (2–tailed)	<.001	.000	<.001		<.001	<.001	<.001	<.001	.520	<.001	<.001
	N	3184	3184	3183	3184	3184	3184	3184	3184	3184	3184	3184
Internal Finance 2021	Pearson Correlation	.248**	.219**	.250**	.208**	1	.164**	.091**	.964**	.077**	.122**	.334**
	Sig. (2–tailed)	<.001	<.001	<.001	<.001		<.001	<.001	.000	<.001	<.001	<.001
	N	3184	3184	3183	3184	3184	3184	3184	3184	3184	3184	3184
External Finance 2021	Pearson Correlation	.032	.164**	.034	.154**	.164**	1	.039*	.214**	.041*	.158**	.166**
	Sig. (2–tailed)	.070	<.001	.055	<.001	<.001		.029	<.001	.019	<.001	<.001
	N	3184	3184	3183	3184	3184	3184	3184	3184	3184	3184	3184
Shareholder equity 2021	Pearson Correlation	.047**	.092**	.040*	.086**	.091**	.039*	1	.090**	−.022	−.016	.014
	Sig. (2–tailed)	.009	<.001	.024	<.001	<.001	.029		<.001	.214	.374	.427
	N	3184	3184	3183	3184	3184	3184	3184	3184	3184	3184	3184
Cashflow 2021	Pearson Correlation	.212**	.206**	.213**	.200**	.964**	.214**	.090**	1	.039*	.139**	.345**
	Sig. (2–tailed)	<.001	<.001	<.001	<.001	.000	<.001	<.001		.030	<.001	<.001
	N	3184	3184	3183	3184	3184	3184	3184	3184	3184	3184	3184
Size 2021	Pearson Correlation	.011	.001	.011	−.011	.077**	.041*	−.022	.039*	1	−.011	.068**
	Sig. (2–tailed)	.530	.967	.544	.520	<.001	.019	.214	.030		.534	<.001
	N	3184	3184	3183	3184	3184	3184	3184	3184	3184	3184	3184
Growth 2021	Pearson Correlation	.003	.064**	.004	.071**	.122**	.158**	−.016	.139**	−.011	1	−.007
	Sig. (2–tailed)	.867	<.001	.838	<.001	<.001	<.001	.374	<.001	.534		.686
	N	3184	3184	3183	3184	3184	3184	3184	3184	3184	3184	3184
Cash and equivalents 2021	Pearson Correlation	−.140**	−.059**	−.139**	−.066**	.334**	.166**	.014	.345**	.068**	−.007	1
	Sig. (2–tailed)	<.001	<.001	<.001	<.001	<.001	<.001	.427	<.001	<.001	.686	
	N	3184	3184	3183	3184	3184	3184	3184	3184	3184	3184	3184

**. Correlation is significant at the 0.01 level (2–tailed).

*. Correlation is significant at the 0.05 level (2–tailed).

Table 11a) Mann Whitney U test statistic construction industry (pre-crisis)

Test Statistics[a]

	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
Investment 1 2021	616775.000	933981.000	-1.060	.289
Investment 2 2021	604275.000	921481.000	-1.847	.065
Investment 3 2021	616156.000	933362.000	-1.075	.282
Investment 4 2021	595515.000	912721.000	-2.399	.016
Internal Finance 2021	583138.000	900344.000	-3.178	.001
External Finance 2021	565483.000	882689.000	-4.290	<.001
Shareholder equity 2021	544217.500	861423.500	-5.628	<.001
Cashflow 2021	570132.000	887338.000	-3.997	<.001
Size 2021	617388.000	1885416.000	-1.022	.307
Growth 2021	585035.500	902241.500	-3.063	.002
Cash and equivalents 2021	569902.000	1837930.000	-4.011	<.001

a. Grouping Variable: Pre crisis dummy

Table 11b) Mann Whitney U test statistic construction industry (post-crisis)

Test Statistics[a]

	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
Investment 1 2021	313754.000	630960.000	-.333	.739
Investment 2 2021	294234.000	611440.000	-2.461	.014
Investment 3 2021	313293.000	630499.000	-.383	.702
Investment 4 2021	294631.000	611837.000	-2.418	.016
Internal Finance 2021	278444.000	595650.000	-4.183	<.001
External Finance 2021	224426.000	541632.000	-10.073	<.001
Shareholder equity 2021	271498.500	588704.500	-4.940	<.001
Cashflow 2021	278993.000	596199.000	-4.123	<.001
Size 2021	287449.000	604655.000	-3.201	.001
Growth 2021	290193.000	607399.000	-2.907	.004
Cash and equivalents 2021	277763.000	594969.000	-4.257	<.001

[a.] Grouping Variable: Post crisis dummy

Table 12a) Mann Whitney U test statistic retail and wholesale industry (pre-crisis)

Test Statistics[a]

	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
Investment 1 2021	3249274.000	9759910.000	-.095	.924
Investment 2 2021	3149959.000	4778069.000	-1.928	.054
Investment 3 2021	3241734.000	9737944.000	-.134	.893
Investment 4 2021	3152943.500	4781053.500	-1.873	.061
Internal Finance 2021	3084267.000	4712377.000	-3.140	.002
External Finance 2021	2771575.000	4399685.000	-8.911	<.001
Shareholder equity 2021	2879243.000	4507353.000	-6.924	<.001
Cashflow 2021	3057025.000	4685135.000	-3.643	<.001
Size 2021	3171679.500	9682315.500	-1.527	.127
Growth 2021	2855573.500	4483683.500	-7.383	<.001
Cash/equivalents 2021	2900965.500	9411601.500	-6.523	<.001

[a.] Grouping Variable: Pre crisis dummy

Table 12b) Mann Whitney U test statistic retail and wholesale industry (post-crisis)

Test Statistics[a]

	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
Investment 1 2021	1624705.000	3252815.000	-.080	.936
Investment 2 2021	1555946.000	3184056.000	-2.278	.023
Investment 3 2021	1624146.000	3250452.000	-.011	.991
Investment 4 2021	1588978.500	3217088.500	-1.222	.222
Internal Finance 2021	1346248.000	2974358.000	-8.981	<.001
External Finance 2021	1267459.000	2895569.000	-11.499	<.001
Shareholder equity 2021	1282144.000	2910254.000	-11.030	<.001
Cashflow 2021	1336224.000	2964334.000	-9.301	<.001
Size 2021	1515234.500	3143344.500	-3.579	<.001
Growth 2021	1435983.000	3064093.000	-6.130	<.001
Cash/equivalents 2021	1468602.500	3096712.500	-5.070	<.001

[a.] Grouping Variable: Post crisis dummy

Table 23) Construction industry regression assumption: Linearity

Table 23a) Construction industry regression assumption: Linear relationship Investment and Internal Finance.

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Investment 1 2021 * Internal Finance 202	Between Groups	(Combined)	1,169	2718	,000	2.926E+16	,000
		Linearity	,027	1	,027	1.824E+18	,000
		Deviation from Linearity	1,143	2717	,000	2.860E+16	,000
	Within Groups		,000	9	,000		
	Total		1,169	2727			

Table 23b) Construction industry regression assumption: Linear relationship Investment and Shareholder Equity

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Investment 1 2021 * Shareholder equity 202	Between Groups	(Combined)	1,169	2726	,000	5,739	,324
		Linearity	,000	1	,000	3,276	,321
		Deviation from Linearity	1,169	2725	,000	5,740	,324
	Within Groups		,000	1	,000		
	Total		1,169	2727			

Table 23c) Construction industry regression assumption: Linear relationship Investment and Cashflow

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Investment 1 2021 * Cashflow 202	Between Groups	(Combined)	1,169	2718	,000	2.926E+16	,000
		Linearity	,017	1	,017	1.189E+18	,000
		Deviation from Linearity	1,152	2717	,000	2.883E+16	,000
	Within Groups		,000	9	,000		
	Total		1,169	2727			

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Table 23d) Construction industry regression assumption: Linear relationship Investment and Size

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Investment 1 2021 * Size 202	Between Groups	(Combined)	1,169	2716	,000	933103103047.8	<,001
		Linearity	,017	1	,017	3.758E+13	<,001
		Deviation from Linearity	1,152	2715	,000	919605625066.2	<,001
	Within Groups		,000	11	,000		
	Total		1,169	2727			

Table 23e) Construction industry regression assumption: Linear relationship Investment and Growth

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Investment 1 2021 * Growth 202	Between Groups	(Combined)	,522	1045	,000	1,296	<,001
		Linearity	,000	1	,000	,212	,646
		Deviation from Linearity	,521	1044	,000	1,297	<,001
	Within Groups		,648	1682	,000		
	Total		1,169	2727			

Table 23f) Construction industry regression assumption: Linear relationship Investment and Cash and Cash equivalents

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Investment 1 2021 * Cash and equivalents 202	Between Groups	(Combined)	1,169	2716	,000	799,509	<,001
		Linearity	,010	1	,010	19241,583	<,001
		Deviation from Linearity	1,159	2715	,000	792,716	<,001
	Within Groups		,000	11	,000		
	Total		1,169	2727			

Table 24) Construction industry regression assumption: Multicollinearity

Collinearity Diagnostics[a]

				Variance Proportions									
Model	Dimension	Eigenvalue	Condition Index	(Constant)	Crisis	Post_Crisis	Internal Finance 2021	External Finance 2021	Shareholder equity 2021	Cashflow 2021	Size 2021	Growth 2021	Cash and equivalents 2021
1	1	4.602	1.000	.00	.01	.01	.00	.00	.00	.00	.00	.00	.01
	2	1.157	1.994	.00	.10	.00	.00	.26	.03	.00	.00	.28	.00
	3	1.070	2.074	.00	.15	.23	.00	.04	.01	.00	.00	.26	.00
	4	1.009	2.135	.00	.00	.00	.00	.03	.88	.00	.00	.04	.00
	5	.792	2.411	.00	.18	.01	.00	.57	.04	.00	.00	.08	.00
	6	.704	2.556	.00	.01	.24	.01	.04	.04	.01	.00	.30	.00
	7	.349	3.633	.00	.48	.46	.01	.00	.00	.01	.00	.00	.21
	8	.293	3.965	.01	.06	.05	.00	.02	.00	.00	.01	.02	.77
	9	.018	15.776	.00	.00	.00	.94	.03	.00	.94	.00	.00	.00
	10	.006	28.730	.99	.00	.00	.04	.01	.00	.04	.99	.00	.00

a. Dependent Variable: Investment

Table 25) Construction industry regression assumption: Autocorrelation

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,273[a]	,074	,072	.0199492100835	,879

[a.] Predictors: (Constant), Cash and equivalents 2021, Shareholder equity 2021

, Growth 2021, Size 202

1 , External Finance 20

21 , Internal Finance 2

021 , Cashflow

[b.] Dependent Variable: Investment 1 2021

Table 26) Retail and Wholesale Linearity assumption

Table 26a) Retail and Wholesale industry regression assumption: Linear relationship Investment and Cash and Cash equivalents

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Investment * Cash/equivalents 2021	Between Groups	(Combined)	1,767	6216	,000	209,332	<,001
		Linearity	,002	1	,002	1742,738	<,001
		Deviation from Linearity	1,765	6215	,000	209,085	<,001
	Within Groups		,000	11	,000		
	Total		1,767	6227			

Table 26b) Retail and Wholesale industry regression assumption: Linear relationship Investment and Size

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Investment * Size 2021	Between Groups	(Combined)	1,767	6216	,000	209,332	<,001
		Linearity	,011	1	,011	8423,036	<,001
		Deviation from Linearity	1,755	6215	,000	208,010	<,001
	Within Groups		,000	11	,000		
	Total		1,767	6227			

Table 26c) Retail and Wholesale industry regression assumption: Linear relationship Investment and Growth

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Investment * Growth 2021	Between Groups	(Combined)	,499	1483	,000	1,257	<,001
		Linearity	,004	1	,004	13,961	<,001
		Deviation from Linearity	,495	1482	,000	1,249	<,001
	Within Groups		1,268	4744	,000		
	Total		1,767	6227			

Table 26d) Retail and Wholesale industry regression assumption: Linear relationship Investment and Shareholder equity

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Investment * Shareholder equity 2021	Between Groups	(Combined)	1,766	6219	,000	2,374	,091
		Linearity	,000	1	,000	,525	,490
		Deviation from Linearity	1,766	6218	,000	2,374	,091
	Within Groups		,001	8	,000		
	Total		1,767	6227			

Table 27)Retail and Wholesale: Multicollinearity assumption

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	(Constant)	Internal Finance 2021	External Finance 2021	Shareholder equity 2021	Cashflow 2021	Size 2021	Growth 2021	Cash/equivalents 2021	Crisis	Post_Crisis
1	1	4,189	1,000	,00	,01	,00	,00	,01	,00	,00	,02	,01	,01
	2	1,140	1,917	,00	,01	,47	,07	,00	,00	,11	,00	,03	,02
	3	1,073	1,976	,00	,04	,05	,17	,02	,00	,05	,00	,17	,01
	4	1,056	1,991	,00	,00	,00	,00	,00	,00	,46	,00	,10	,19
	5	,965	2,084	,00	,00	,01	,75	,00	,00	,10	,00	,06	,01
	6	,692	2,460	,00	,04	,34	,00	,04	,00	,24	,01	,01	,19
	7	,423	3,147	,00	,01	,01	,00	,00	,00	,00	,75	,21	,25
	8	,347	3,477	,01	,00	,00	,00	,00	,01	,02	,20	,41	,32
	9	,111	6,154	,00	,88	,11	,00	,92	,00	,00	,01	,00	,00
	10	,004	31,503	,99	,00	,00	,00	,00	,99	,00	,01	,00	,00

a. Dependent Variable: Investment

Table 28) Retail and Wholesale: Autocorrelation assumption

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	,229[a]	,052	,049	.0202634025377	,052	14,938	5	1352	<,001	1,285

a. Predictors: (Constant), Crisis, Size 2021

, Growth 2021, Internal Finance 202

1 , External Finance 20

b. Dependent Variable: Investment 1 2021

Table 29)Collinearity analysis Retail and Wholesale industry: Interaction models

Table 29a) Collinearity Analysis: Retail and Wholesale Industry: Interaction Model Crisis Period

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,037	,002		15,851	<,001
	Crisis	-,001	,001	-,023	-1,597	,110
	Internal Finace * Crisis	,007	,004	,029	1,818	,069
	External Finace * Crisis	,007	,003	,041	2,886	,004
	Internal Finance 2021	,011	,002	,091	6,201	<,001
	External Finance 2021	,003	,001	,042	2,990	,003
	Shareholder equity 2021	-,172	,140	-,015	-1,230	,219
	Size 2021	-,004	,001	-,085	-6,785	<,001
	Growth 2021	,004	,001	,033	2,598	,009
	Cash/equivalents 2021	-,007	,001	-,061	-4,728	<,001

a. Dependent Variable: Investment

Table 29b) Collinearity Analysis: Retail and Wholesale Industry: Interaction Model Post-Crisis Period

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,036	,002		15,648	<,001
	Post_Crisis	,001	,001	,024	1,607	,108
	Internal Finace * Post Crisis	-,006	,003	-,034	-1,806	,071
	External Finance * Post Crisis	-,006	,002	-,039	-2,619	,009
	Internal Finance 2021	,016	,002	,131	7,446	<,001
	External Finance 2021	,006	,001	,086	5,549	<,001
	Shareholder equity 2021	-,161	,140	-,014	-1,147	,251
	Size 2021	-,004	,001	-,086	-6,790	<,001
	Growth 2021	,004	,001	,033	2,613	,009
	Cash/equivalents 2021	-,007	,001	-,061	-4,776	<,001

a. Dependent Variable: Investment

7.2 Appendix B – Figures

Figure 1: Split histogram construction industry size
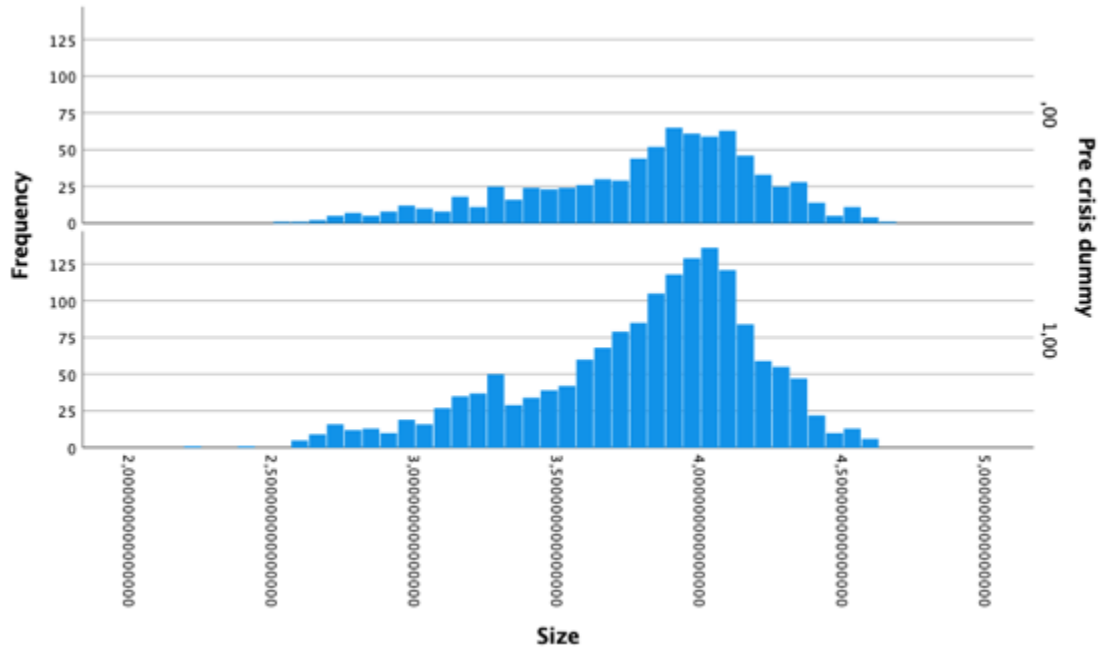
Figure 2: Split histogram construction industry size
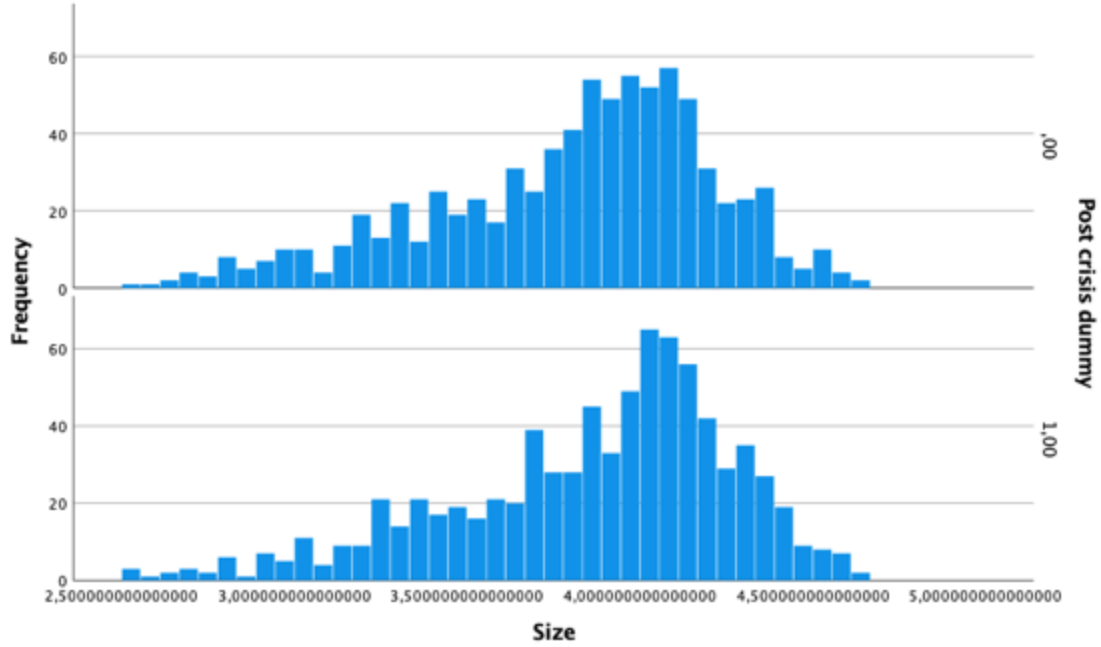
Figure 3: Split histogram construction industry investment_2
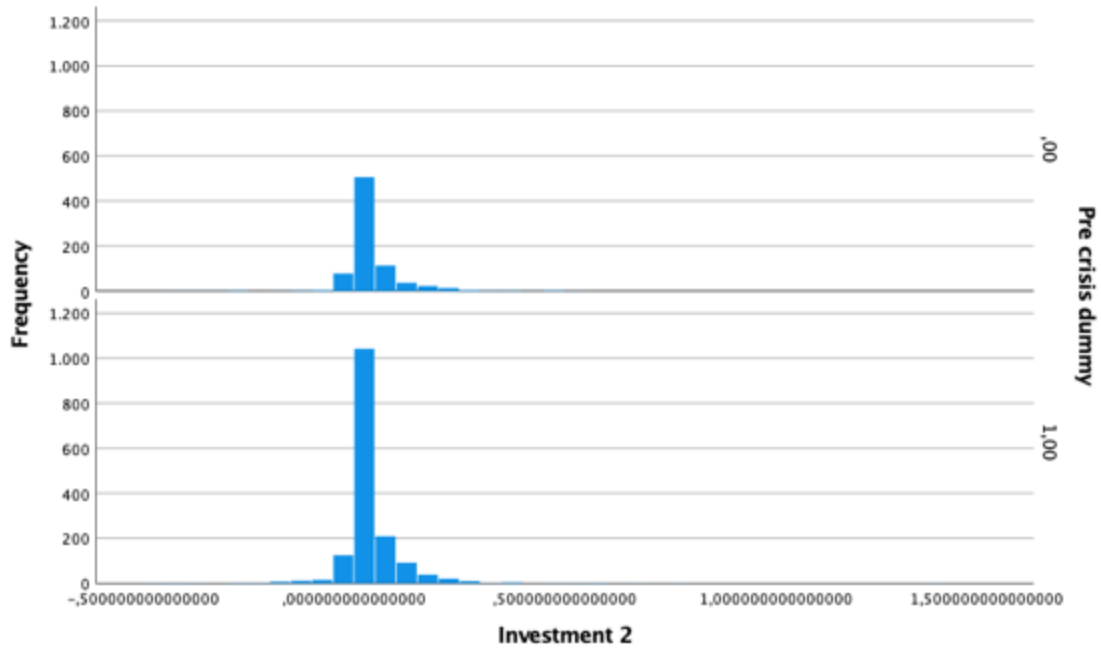
Figure 4: Split histogram construction industry cash and cash equivalents
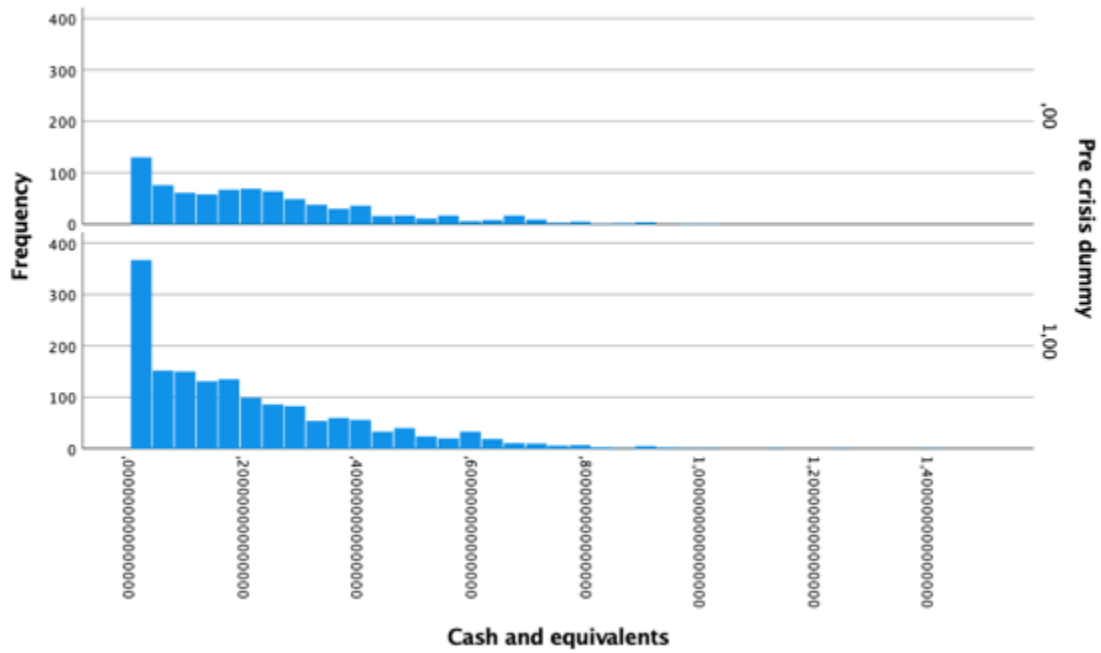
Figure 5: Split histogram retail and wholesale industry cash and cash equivalents
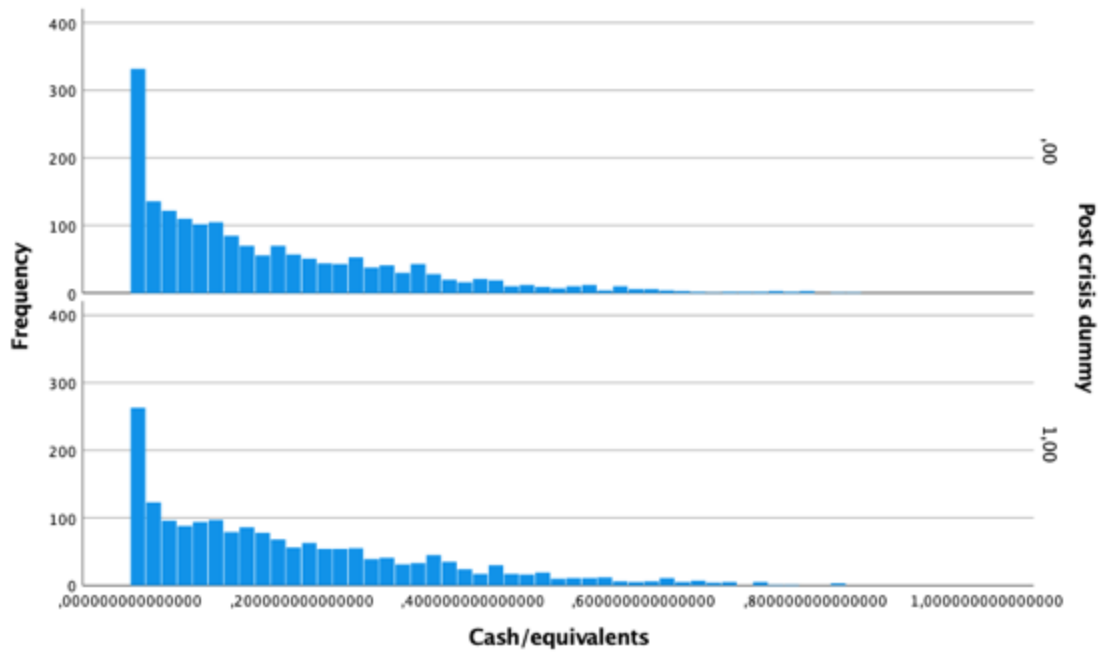
Figure 6: Split histogram retail and wholesale industry cash and cash equivalents
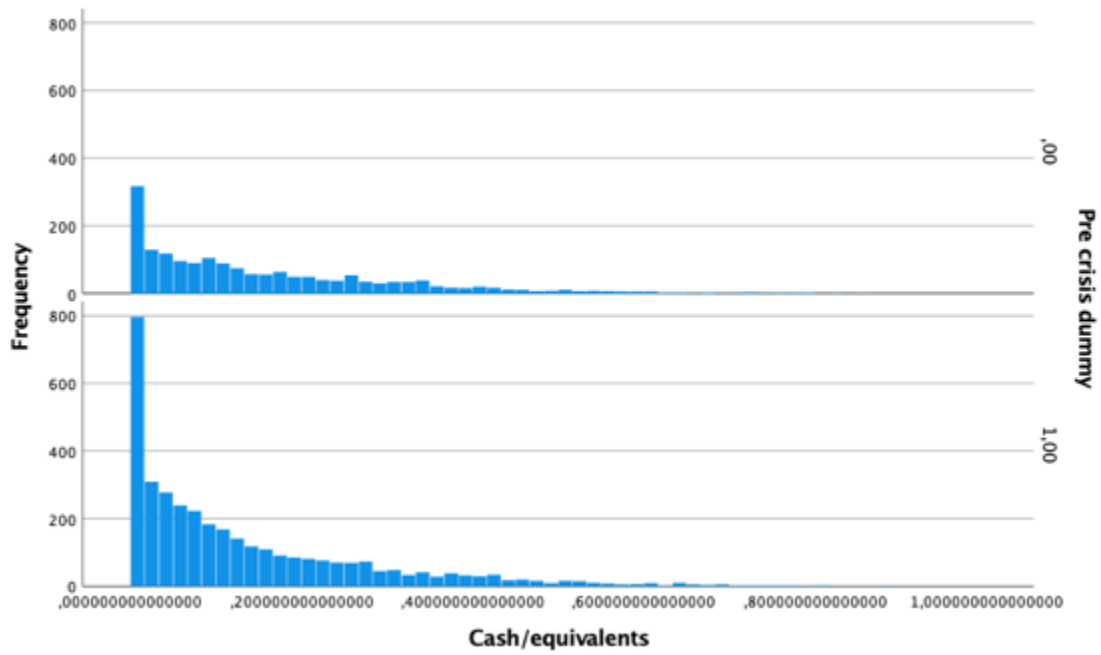
Figure 7: Split histogram retail and wholesale industry internal finance
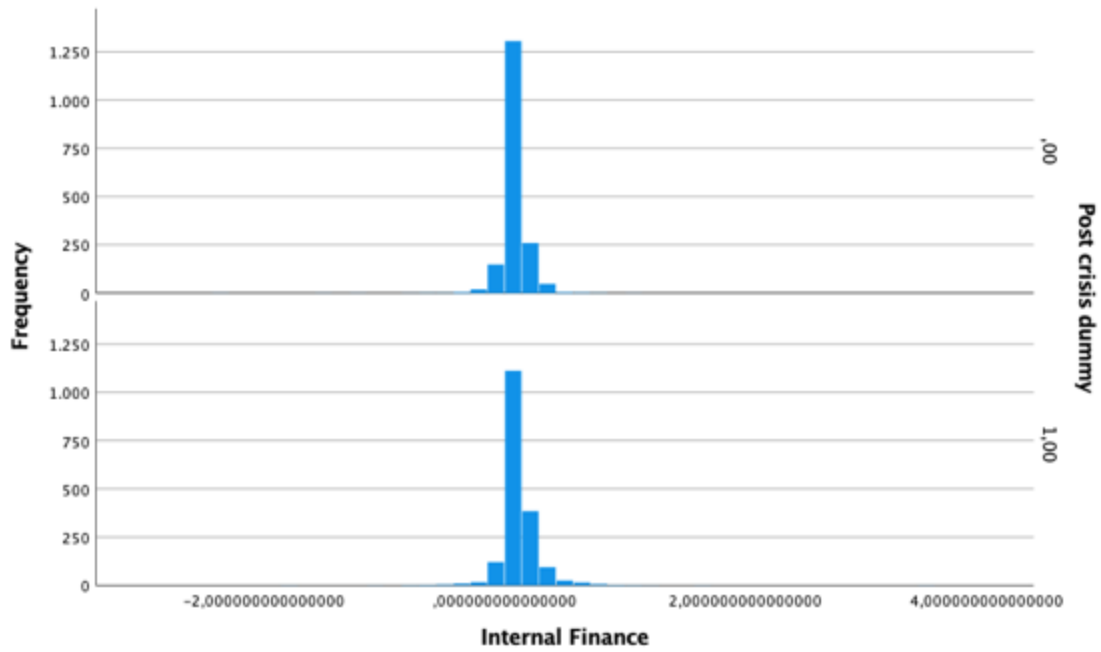
Figure 8: Split histogram retail and wholesale industry cashflow
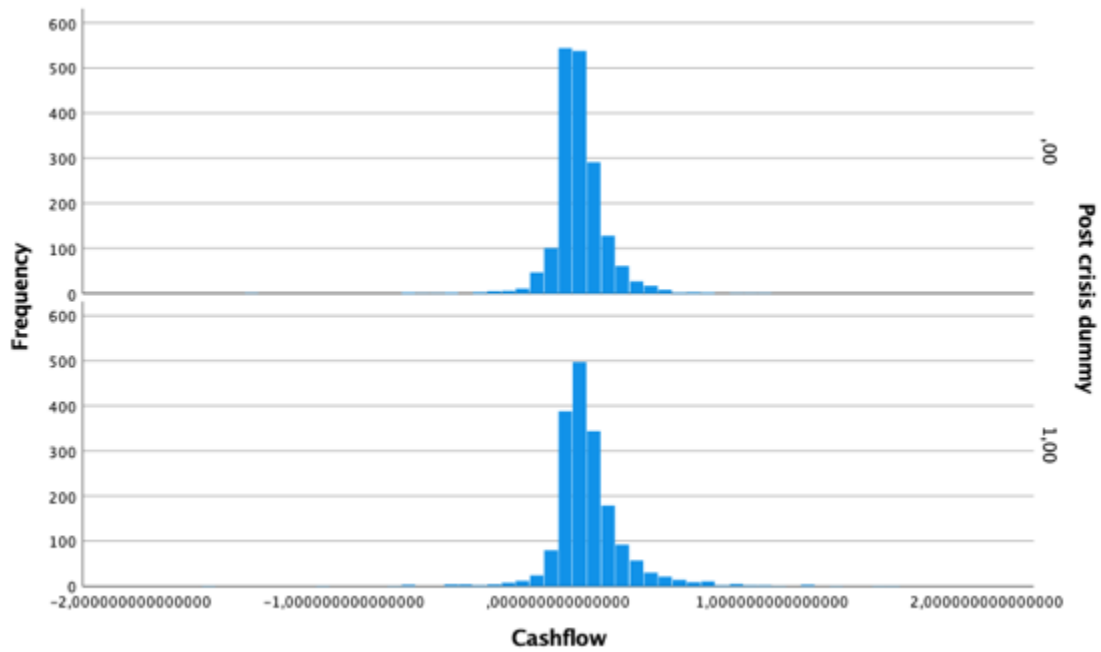
Figure 9: Construction industry regression assumption: Linear relationship Investment and External Finance
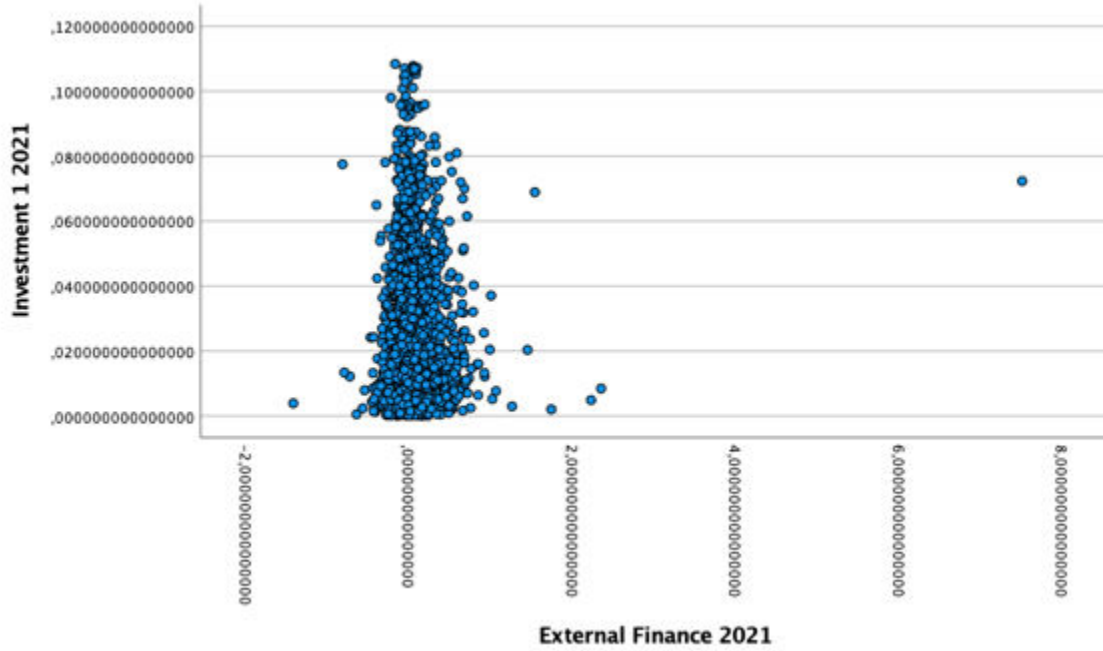
Figure 9: Construction industry regression assumption: Normality of residuals histogram
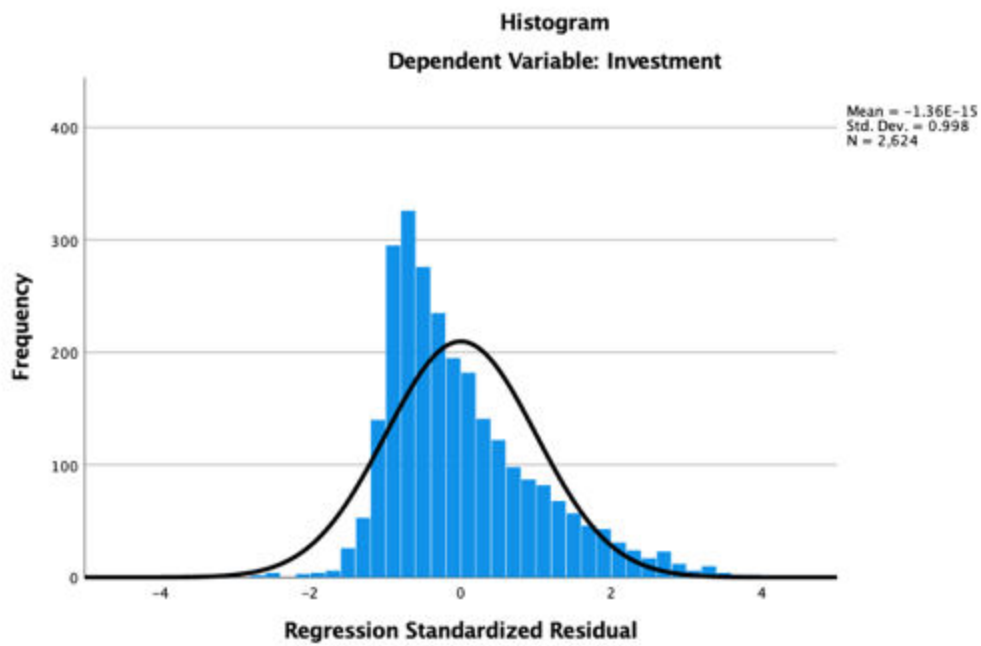
Figure 10: Construction industry regression assumption: Normality of residuals P-P Plot
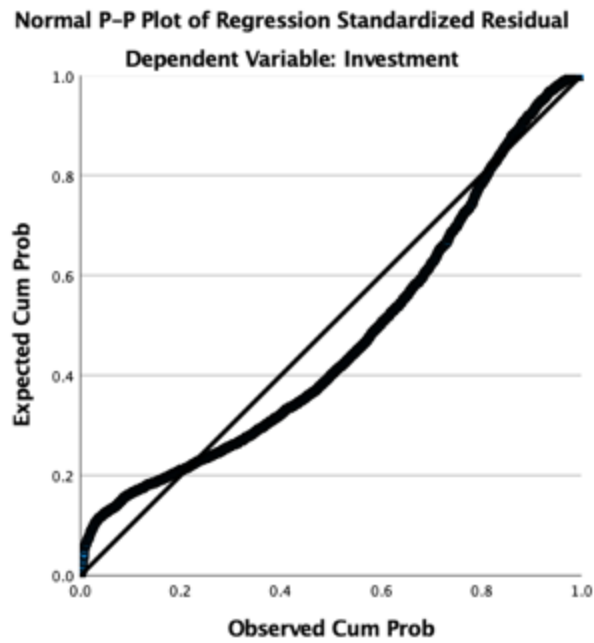
Figure 10: Construction industry regression assumption: Homoscedasticity
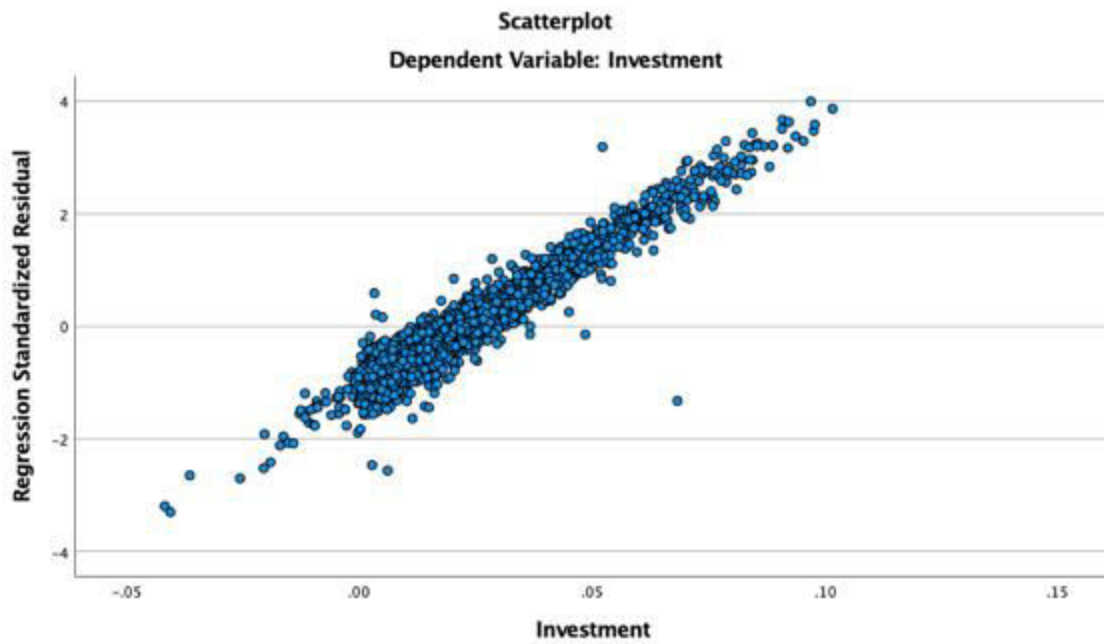
Figure 11: Retail and Wholesale industry regression assumption: Normality of residuals histogram
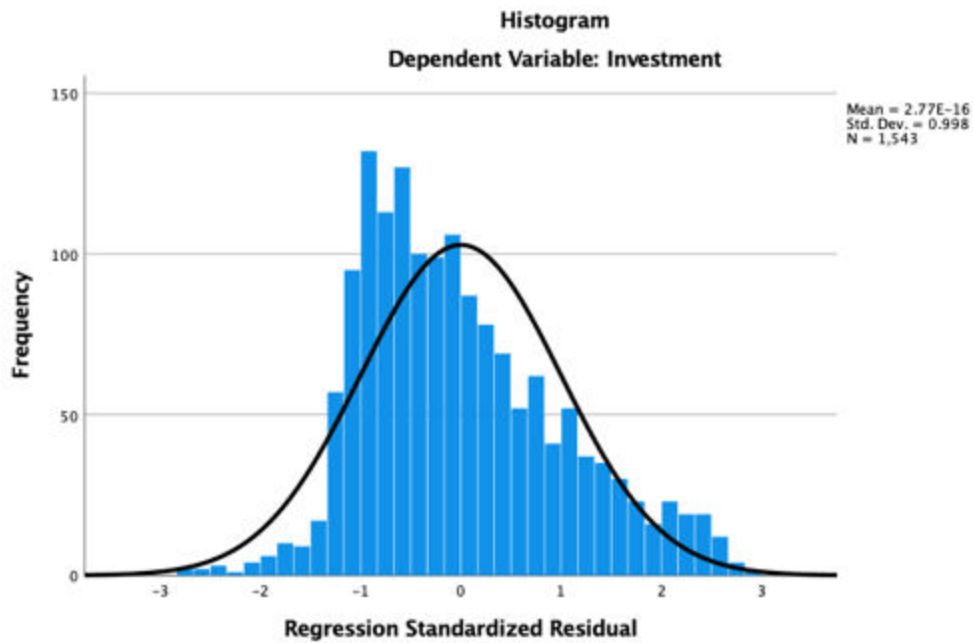
Figure 12: Retail and Wholesale industry regression assumption: Normality of residuals P-P Plot
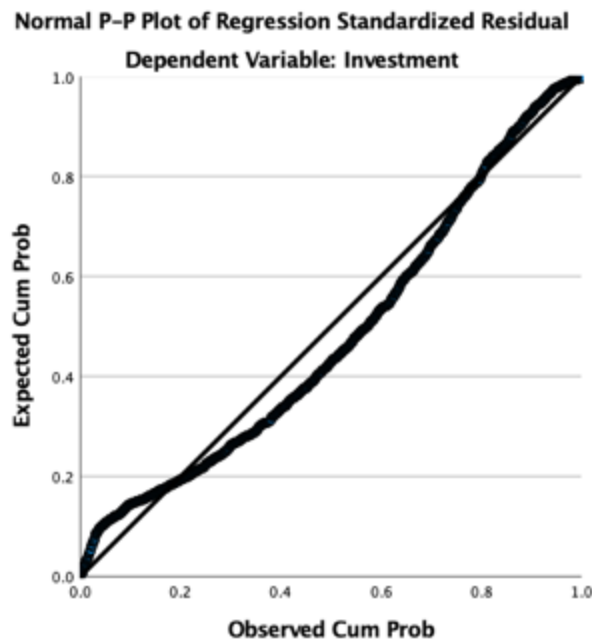
Figure 10: Retail and Wholesale industry regression assumption: Homoscedasticity

Scatterplot

Dependent Variable: Investment
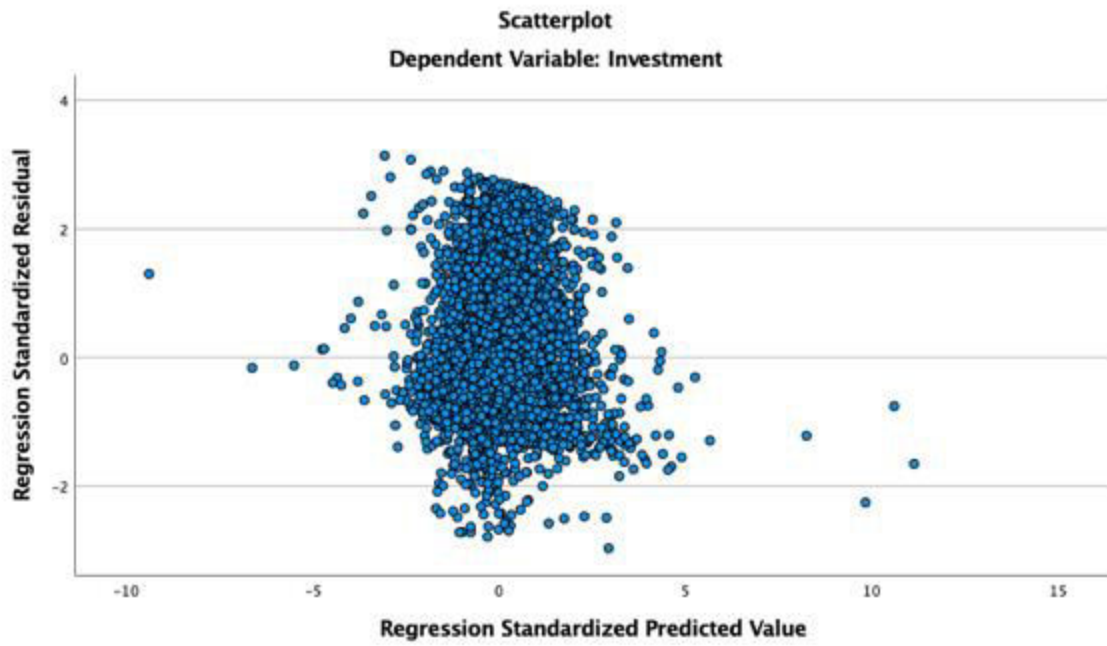
15 Page Summary

Introduction

In the OECD area, SMEs account for 99% of all enterprises and are responsible for 60% of value-added. They often contribute significantly to urban identity and social solidarity of local communities and are a thriving factor for economic development (OECD, 2019). SMEs serve as a foundation for job creation (Ayyagari, Demirgüç-Kunt & Maksimovic, 2011 and Birch, 1987) with two-thirds of employees in the OECD area working for SMEs (OECD, 2019). Moreover, they foster entrepreneurship as well as facilitate innovation (Block, Colombo, Cumming & Vismara, 2018 and Dutta & Folta, 2016) and are flexible to adapt to today's rapidly changing market conditions. Yet, these social and economic benefits can only materialize if small businesses survive and prosper. The Covid-19 pandemic and the subsequent shock to the economy was unprecedented both in its complexity and severity. Global lockdowns and changes in consumer behavior caused by fear of the coronavirus have not only disrupted the supply side of the economy but also led to the biggest collapse in consumer demand since the Great Depression. The gravity of the recession and the prevailing uncertainty about the recovery raised concerns that many small companies would not survive the crisis.

As SMEs have inherently fewer human, financial and capital resources than larger companies they are regarded to be most vulnerable to economic shocks. (Verbano & Venturini, 2013). This susceptibility was particularly evident during and after the global financial crisis of 2007/08 when SMEs experienced both a sharp fall in demand and many companies ran into financial difficulties. Their lower resilience means that SMEs are hit harder during a crisis and suffer longer from its consequences. Data from the ECB and the European Commission (EC) revealed that the financial crisis was accompanied by a sharp deterioration in credit conditions for SMEs as well as severely affected long-term capital structure and investment (Vermoesen, Deloof & Laveren, 2013 and D'Amato, 2020). Although the origin and complexity of the current crisis differ from the 2008 financial crisis (Ernst & Young, 2021), SMEs stand at the center of the disruptions and are among the most affected companies (OECD, 2021).

Clearly, the relevance for society as a whole is given, since failing to support SMEs would cause devastation for many. Therefore, this paper academically contributes by investigating the relationship between the Covid-19 pandemic and firms' financing and investment. The results are intended to elucidate on the consequences of the government's far-reaching measures to contain the virus. Thereby, the paper finds that investment did not significantly differ during the studied periods. However, the relationship between external financing on investment amplified following the onset of

the crisis, while becoming negligible during the post-crisis period. Internal finance exhibited an opposing effect, being more determined for a firm's investment in times of economic equilibrium. These results illustrate the varying relationship of the financing sources depending on the state of the economy.

2.1 General Theory of the Capital Markets and Market Imperfections

The Modigliani-Miller theorem, a foundational work in the corporate finance literature, states that a company's capital structure is irrelevant to its value and is composed independently of factors such as debt or taxes. Internal and external capital serve as perfect substitutes, and all opportunities with positive net present value (NPV) are financed and thus realized (Modigliani and Miller, 1958). In the frictionless capital markets of Modigliani and Miller (1958), capital is provided at the risk-free interest rate combined with a risk premium that reflects only the asset's systematic risk. In an equilibrium lending market, prices only rise when demand exceeds supply and/or supply rises until demand and supply equalize at the new equilibrium price. In reality, however, market frictions, asymmetric information, and risk-averse investors erode this concept, leading to capital allocation, preferences and constraints. Akerlof's (1970) lemon principle has accurately portrayed the fundamental problem of asymmetric information between sellers and buyers. The theory describes that buyers and sellers do not have the same amount of information they need to make an informed decision about a transaction, placing the seller at a disadvantage. The buyer who does not possess complete information is unwilling to pay a fair price due to the fear of receiving a "*lemon*".

In modern capital markets, this conflict is described by the agency theory of Jensen & Meckling (1976). The theory deals with the conflict-of-interest present in any relationship in which one party is expected to act in the best interests of the others. To overcome this, market participants require remunerations for supervision and the incentive alignment mechanism. (Tosi, Katz & Gomez-Mejia 1997). Lenders such as banks require a risk premium based not only on the systematic risk of the assets' cash flow but also on idiosyncratic factors (Degryse, Goeij & Kappert, 2010). The literature states that the size and age of a company determine its propensity to obtain capital (Sogorb-Mira, 2005; Gregory, Rutherford, Oswald & Gardiner, 2005). Older and bigger companies have greater information permeability, a larger stock of pledgeable assets that serve as collateral and better capacities to internalize their financing needs and redeploy their capital according to their exigencies (Beck and Demirguc-Kunt, 2006). The standard neoclassical growth theory (Solow,1956) identifies capital as one of the three factors driving economic growth. A lack of availability of one of the factors would inherently decelerate long-term growth.

Summarizing the above findings, the financing constraint literature has its provenance in the discrepancy of information availability between two parties, market frictions and the action of risk

adverse investors. SMEs, particular affected by greater information opacity, appear to be at a disadvantage when it comes to financing compared to larger companies. Greater agency costs and lending premiums are the consequence.

2.2 SME Financing Constraints in Equilibrium

Jaffee and Russell (1976) developed a model demonstrating credit rationing as a market response to adverse selection. In their model, borrowers have greater information about the likelihood of default than lenders. The asymmetric information leads "*dishonest*" borrowers to take advantage of lenders by deliberately defaulting on their loans whenever this leads to an increase in their utility. In response, borrowers are rationed in the amount of their borrowing to achieve an equilibrium where no one defaults. Thus, in their model, the competitive credit market restricts the availability of credit due to information asymmetry, even for participants who can derive greater utility from repaying the loan. The authors acknowledge that, in reality, loan markets exhibit different features, with banks requiring collateral or governments imposing regulations on the market.

The model by Stiglitz & Weiss (1981) explains the functions of the credit market in the presence of limited information. The authors point out that in an equilibrium, the lending market is characterized by credit constraints and that the degree of moral hazard depends on the interest rates charged by the bank. While interest rates can serve as screening techniques, individuals that are willing to pay higher interest rates may, on average, be riskier. Their willingness to borrow at higher rates indicates that they perceive their probability of repaying the loan to be lower, ultimately lowering the banks' profit. Additionally, the authors argue that raising interest rates lowers the return of successful projects. Eventually, inducing firms to undertake projects with lower probabilities of success but higher payoffs. Hence, banks are not incentivized to reciprocate increasing credit demand with higher interest rates or smaller loans but with a limiting number of credits.

Holmstrom and Tirole (1997) studied a moral hazard model on capital constraint lending. The same model was applied by Hoshi, Kashyap, and Scharfstein (1993) and Repullo and Suarez (1995) with the difference that Holmstrom and Tirole (1997) account for capital constraint intermediaries in their analysis. The model examines how the allocation of wealth among companies, intermediaries, and investors affects investment, interest rates, and monitoring mechanisms. Their model differentiates between three categories of investors with well-capitalized firms on the one hand side and poorly capitalized firms on the other side. The model shows that after the occurrence of a capital shortage, poorly capitalized firms are the first to face financial constraints. In the model, poorly capitalized firms suffer from higher agency costs and therefore face monitoring premiums. Since intermediaries suffer from credit constraints and monitoring intensity is higher for poorly capitalized firms, they are the first to be shorted out.

In a more recent study, Ascioglu, Hegde, and McDermott (2008) investigate whether market imperfections such as information asymmetry erode the perfect substitution of internal and external capital and if capital investment is related to the cash flow of the company. Their research is the first to construct measures of information asymmetry from the microstructure literature. They define the *relative effective spread*, the *price impact of a trade,* and the *probability of informed trading* as a proxy for information asymmetry. Further, they classify their sample firms into three categories ordering them from constraint to not constraint. Their analysis suggests that firms with high information asymmetry have greater investment–cash flow sensitivity, indicating higher reliance on internal capital. Overall, their results are consistent with the above-mentioned research findings that firms for which information is opaque face greater financing constraints and rely more heavily on internal capital to finance investments.

The above models are unambiguous in their theoretical proposition that information asymmetry leads to credit constraints; moreover, there is consent in the empirical literature as to which companies are most affected. Gregory, Rutherford, Oswald, and Gardiner (2005), Sogorb Mira (2005), and Degryse, Goeij, and Kappert (2010) all argue that as companies grow in size and age, their information transparency increases simultaneously, giving them wider access to external financing. Consequently, SMEs suffer from more severe information asymmetries leading to higher financing premiums or capital constraints. Berger and Udell (1998) found that firms' capital structure varies with firm size and age. Firms follow a financial growth cycle that determines the optimal capital structure at each point in time. While larger companies can use the public capital market to adapt to changing economic conditions, SMEs have limited access to these sources. The authors' reason that greater information transparency and agency costs lead to a higher debt financing premium. Carpenter & Peterson (2002) demonstrate for a sample of 1,600 US firms that SMEs are, in fact, financially constrained in their growth. The paper by Rien (2003) analyses the growth-cashflow sensitivity for different firm sizes. The research shows that the sensitivity of firm growth to cash flow decreases with increasing firm size, implying that SMEs are more dependent on internal funds compared to larger firms. Watson and Wilson's (2002) study identified that SMEs prefer retained earnings over debt and debt over new share issues to outsiders. Smaller firms tend to finance their operations with internal capital, while more mature firms with larger histories rely more on debt (Nofsinger and Wang 2011, Vaznyte and Andries 2019, Frank and Goyal 2002). Fazzari, Hubbard & Petersen (1988) examine the differences in investment policies of firms with financial constraints. They divide firms into three categories according to the amount of retained earnings. They observe that firms with external financing constraints show higher reliance on internal funds and are forced to have higher retention rates. The entities they identify to be most financially constrained are younger and smaller than their peers.

Moreover, their investments are more dependent on cash flow and liquidity and not all investment opportunities can be exploited.

In summary, the literature identifies a strong link between information asymmetry and financial constraints. The lack of adequate knowledge about the borrower's status-quo prompts lenders such as banks to restrict credit supply or raise interest rates. Inherently, SMEs tend to suffer from bigger information opacity, consequently restricting their access to external finance.

2.3 Financing Constraints of SMEs in Terms of Crisis

The following section discusses the crisis-related financing bottlenecks of SMEs. Whereas SMEs already suffer from limited access to external capital, these inequalities may be exacerbated during an economic downturn.

Michaelas, Chittenden and Poutziouris (1999) use panel data to review different capital structure theories of SMEs in the UK. While they confirm the relevance of theories discussed in chapter 2, they provide evidence, suggesting that small firms' capital structure is time and industry dependent. The average short-term debt ratios of small firms tend to increase in times of economic downturn and decrease when economic conditions in the market improve, highlighting the sensitivity of small firms to macroeconomic changes.

Piette and Zachary (2015) studied the effect of the financial crisis of 2007/08 on SMEs financing in Belgium. In their model, banks associated the crisis with increased risks in lending to SMEs and reduced their credit supply, particularly by adjusting the collateral required. However, in the aftermath of the crisis, Belgian banks did not impose tougher restrictions on their existing customers, suggesting that they preferred to maintain long-term relationships with present customers.

Dubovik (2019) studies credit rationing from 2007 until 2016 in the Dutch market. His results show that before the financial crisis of 2007/08, there was no clear evidence for differences between small and large firms' credit rationing. The author shows, that following the financial crisis, credit rationing for the largest 20% of the companies decreased substantially while credit rationing for the smallest 20% remained at a high level.

Overall, long-term consequences for SMEs seem to diverge with companies in the Netherlands suffering long-lasting consequences from the credit squeeze while Belgian firms seem to enjoy the benefit of relationship lending. However, while SMEs already seem to be financially constrained in equilibrium, past economic recessions exacerbated that phenomenon. Capital lenders such as banks tighten capital supply and become more selective in their choice of borrowers. In particular, age and

size seem to play an even bigger role in times of economic crisis. Early research on the consequences of the Covid-19 crisis confirms the worsen credit conditions for SMEs. Corredera-Catalán, di Pietro & Trujillo-Ponce (2021) report in their paper that SMEs suffer from lower credit supply, higher interest-rates, shorter repayment period and higher requested loan guarantees during the Covid-19 crisis. Especially, sectors with high bank dependence seem to be most heavily affected. Similar impacts are outlined by Dimson et al. (2021), describing liquidity constraints that limit SME financing in Europe.

2.4 The Relationship of Financing Constraints to Firms' Investment

The following section assesses the literature dealing with the impact of financing constraints on firms' investment. First, the routes of the relationship between financing and investment are explored. Second empirical evidence is provided that financial constraint SMEs have reduced investment.

Much of the early investment literature concluded that cash flow and other financial variables have no impact on the investment function. According to the neoclassical investment theory, investment is determined by the marginal product of capital (MPK) and users' cost of capital (Mukherjee, 2015). Myers and Majluf (1984) argue that the dispersion of the firm's management to the supplier of financing intuitively creates information asymmetry, which adds a new dimension to the equation. To determine a firm's investment, it is not only sufficient to know the firm's capital requirements but also whether the desired capital can also be provided (Fazzari and Athey, 1987). Thus, imperfections in the financial market play a major role in a firm's quest for capital and are responsible for the interaction of a firm's investment and financing decisions.

Fazzari, Hubbard, and Petersen (1988) are one of the first to investigate the relationship between financing constraints and the investment behavior of firms. The authors argue that information asymmetry leads to an increase in the cost of external financing, as the counterparty requires compensation for the verification of its investment. Firms, therefore, tend to follow a pecking order when financing investments (Myers and Majluf, 1984), leading to a clear preference for internal over external financing. Companies must resort to external funding only when internal funding is insufficient to continue their investments. Consequently, firms' investment is determined by fluctuations in cash flows, so a firm's capital expenditure depends essentially on the funds it can generate internally and the premium it pays for external financing.

Campello, Graham and Harvey (2010) surveyed 1,050 Chief Financial Officers during the global financial crisis of 2007/08. By employing a matching estimator analysis to account for significant cross-sectional variation in the investment environment of constrained and unconstrained firms, they demonstrate that financially constrained firms had to forgo positive NPV projects. Moreover, they show that constrained firms reduce marketing, R&D and human capital spending, as well as burning

through their credit line more rapidly, in the prospect of credit rejection. Up to 90% of the companies in the sample reported that the tightening of credit supply prevented them from carrying out all valuable investment opportunities. Becchetti and Trovato (2002) empirical findings show that small firms have higher than average growth potential but that a lack of external finance, as well as limited access to foreign markets, hinders expansion. Huovinen and Finnish (2011) employed longitudinal surveys to research the financing constraints of 2,000 SMEs in Finland during the financial crisis of 2007/08. Up to 10% of the sample reported major financing difficulties and 21% had solvency problems. Overall, SMEs reported an increasing demand for short-term financing and a postponement of long-term investments.

In summary, the literature provides clear evidence that financial constraints are associated with a decline in investment. Companies that do not have sufficient access to external sources of capital are usually not able to fully substitute them with internal financing and therefore cannot exploit every investment opportunity.

2.5 Summary

To synthesize all the above finding's, information asymmetry is the core obstacle preventing SMEs from obtaining sufficient external funding. The fundamental problem of asymmetric information in any exchange penalizes the party with greater information opacity. SMEs inherently have less information dissemination due to the nature of their structure and the markets they are operating in. As a result, SMEs must compensate lenders by paying higher premiums on loans. While in a state of an equilibrium higher premiums are sufficient to compensate for the information asymmetry, this is no longer satisfactory in times of crisis. Lenders, especially banks, not only raise the cost of debt but also tightening the allocation of credit. Consequently, leaving some SMEs without the possibility to obtain sufficient financing. Since SME investment depends not only on the availability of projects with positive NPV, but also on the ability to finance these projects, financial constraints have a direct impact on SME investment. Firms that do not obtain sufficient financing have to forgo valuable growth projects that are essential for long-term prosperity. Firms' investment is thus depending on the ability to raise financing, but as internal financing is limited in times of crisis and external financing unobtainable, investment is severely restricted.

Based on the literature review following hypothesis were developed:

H1: The level of external financing of companies increases following the crisis in Covid-19.

H2: Investment of private firms decline following the onset of the corona crisis.

H3: Investments of private firms become more dependent on internal finance than external finance during the corona crisis

H4: The level of investment recovered in the past-crisis period

Summary Descriptive Statistic

Comparing the results from both datasets some similarities and difference become evident. Foremost, in both industries firms reduced their investment during the crisis period while only firms within the construction industry slightly increased their investment in the post-crisis period. Moreover, in both industries firms had a reduction in internal as well as external finance. While external financing fell by about 3 percentage points for both industries, internal financing fell by only 0.866 percentage points in retail and wholesale industry, while it fell by 1.541 percentage points in the construction industry. The size effect was consistently larger for external financing across both samples and both time periods. These findings are in line with the SME United (2020) report, showing that up to 50% of the SMEs in the retail and construction industry face liquidity shortages and Gourinchas, Kalemli-Özcan, Penciakova & Sander (2020) who report that banks became more stringent in their lending conditions. (European Cluster Collaboration Platform, 2020). Growth, measured in employment, declined by around 1.2 percentage points more in the retail and wholesale industry. Joseph, Kneer, Van Horen & Saleheen (2020) and Chang & Yang, (2022) both report that the availability of cash is a critical factor determining investment and SMEs' financing, not only during the crisis but also in the recovery phase. Sample firms act in line with the notion, increasing their cash and cash equivalents drastically during the crisis period. Finally, in the retail and wholesale sample, external financing shows a significantly stronger correlation with the investment variables, while in the construction sample internal financing shows a stronger correlation with the investment variables. This observation can be attributed to the fact that the companies in the construction sample hold a higher percentage of liquid assets and are therefore less dependent on external capital to finance their expenditures.

Methodology

To assess the consequences of the corona crisis on the sample firms a balanced fixed effect panel regression is performed. Investment, proxied as a change in fixed assets plus depreciation scaled by total assets, serves as the dependent variable. This paper follows previous research from Badertscher, Shroff, & White (2013) and Yang et al (2009) who identified firm-level variables such as cash flow, firm size and age as the main explanatory variables to analyze SMEs investment. Cash and cash equivalents serve as an additional independent variable, as research by Martínez-Sola, García-Teruel & Martínez-Solano (2018) has shown that it can greatly improve SMEs' adaptability and resilience to crises. Internal financing, external financing and equity are representative of the different sources of financing for enterprises. In line with previous literature, the analysis includes fixed effects to account for the invariant unobservable characteristics. The following fixed effect Regression Model 1) is estimated:

$$Investment = \alpha + \beta 1\, Crisis + \beta 2\, Post - crisis + \beta 3\, Internal\, Finance_{it}$$
$$+ \beta 4\, External\, Finance_{it} + \beta 5\, Shareholders\, equity_{it} + \beta 6\, Cash\, Flow_{it}$$
$$+ \beta 7\, Size_{it} + \beta 8\, Growth_{it} + \beta 9\, Cash\, and\, equivalents_{it} + Firm_i + \varepsilon_{it}$$

The subscript i relates to individual firms and t to different years. Crisis represents a dummy variable equal to 1 for the year 2020, and 0 otherwise. Post-crisis reports a dummy variable that is equal to 1 for the year 2021, and 0 otherwise.

To investigate whether the financial crisis has had an impact on the way internal and external financing influence investment, a modified version of Regression Model 1), namely Regression Model 2) is adopted:

$$Investment = \alpha + \beta 1\, Crisis\, (Post - crisis) + \beta 2\, Internal\, Finance_{it} + \beta 3\, External\, Finance_{it}$$
$$+ \beta 4\, Shareholders\, equity_{it} + \beta 5\, Internal\, Finance_{it} * Crisis\, (Post - crisis)$$
$$+ \beta 6\, External\, Finance_{it} * Crisis\, (Post - crisis) + \beta 7\, Size_{it} + \beta 8\, Growth_{it}$$
$$+ \beta 9\, Cashflow_{it} + \beta 10\, Cash\, and\, equivalents_{it} + Firm_i + \varepsilon_{it}$$

Regression Model 2) is estimated twice, once for the crisis and once for the post-crisis period. The coefficients of interest are the two interaction coefficients β4 and β5, which capture the change in the effect of internal and external finance, respectively, on a firm's investment during the crisis (post-crisis) period. The interaction model is applied to investigate whether the impact of the two financing methods differs statistically. Moreover, to quantify the effect of the different financing sources over the sample time, separate regressions with Regression Model 1) are carried out across the sub-periods. This approach allows researching the coefficients of the financing sources over the different periods.

Emprical results

7.1 External Finance Analysis

To test Hypothesis 1 whether external financing increased following the Covid-19 crisis, it is examined whether there was a significant difference between the pre-crisis and crisis period. Based on the independent t-test conducted as part of the descriptive statistics, it can be observed that in both industries external finance decreased during the crisis. External finance decreased by 0.667% in the retail and wholesale industry and 1.089% in the construction industry. The decline was significant for both sectors with a medium effect size. Also, internal finance decreased significantly in the crisis period, even though with lower effect sizes. These results provide the first insights into how the Covid-19 impacted the financing behavior of SMEs.

In perfect capital markets, SMEs would replace the lack of internal funding with sufficient external funding to compensate for any loss of income and ensure seamless business operations. However, it can be observed that this reaction fails to materialize as companies not only reduce internal but also external financing. The findings are in line with recent research from Calabrese, Cowling & Liu (2022) who investigated the dynamics of SME financing in the UK in response to Covid-19. They report that 92.1% of debt financing during the crisis period was backed by the government and that banks became reluctant to issue new debt without sufficient collateral. The European Commission (2021) also reports that it is essential for governments to provide full or partial loan guarantees to SMEs to ensure that banks provide adequate lending to illiquid SMEs. Both results indicate that SMEs have limited access to external financing and that only external support can cushion the effect. By all means, firms reduce the amount of external financing, which contradicts Hypothesis 1 that firms would increase external financing following the Covid-19 crisis. For that reason, Hypothesis 1 of this paper is rejected. These results are evidence of the inadequacy of capital markets and are related to the findings of the literature review, especially Calomiris and Hubbard (1990). Their model stresses the importance of internal financing and collateral for lenders and predicts that information-intensive borrowers such as SMEs will be the first to face financial constraints after a systemic shock.

7.2 Investment Analysis

The results of the Regression Model 1) are examined to test Hypothesis 2 and Hypothesis 4, whether investment declined during the Covid-19 crisis and whether investment increased in the post-crisis period. Table 13a) and 13b) present the empirical results for construction industry and the retail and wholesale industry, respectively. Model 1) displays the baseline regression comprising only Crisis, Post-Crisis and firm fixed effects. Model 8) represents the extended regression exhibiting all firm-level control variables, financing sources as well as the Crisis, Post-Crisis variable and firm fixed effects.

7.2.1 Construction Industry

The ANOVA test reports high F-statistics and significant results from Model 2) to Model 8). The adjusted R-square increases continuously with each variable included and reaches 6.3 % in Model 8). The R-square is slightly lower than comparable studies by Vermoesen Deloof & Laveren (2013) and Akbar Rehman & Ormrod (2013) who reported R-square values around the 14% mark. However, as the models show a significant F-statistic it can be assumed that the variation in firms' investment is well explained. Overall, the results indicate no statistically significant decline in investment both during and after the Covid-19 crisis. Both Crisis and Post-crisis variables show no significant effect across all models. Internal Finance, external finance, cash flow, size and cash and cash equivalents all show significant results in Model 8). Both financing sources show positive coefficients suggesting that

firms with availability to internal or external funding undertake more investment. Comparing the coefficients of internal and external financing in Model 8), it can be stated that internal financing has a greater impact on investment than external financing. Cashflow, size and cash and cash equivalents show negative coefficients indicating that bigger firms with more cash inflows and cash reserves undertake less investment. Arslan, Florackis & Ozkan (2006) report in their analysis that in times of crisis firms utilise cash reserves as a hedging device to protect themselves against fluctuations in cash flow and financial constraints. Therefore, they become more selective in investment opportunities and only firms with excessive cash reserves are not sensitive to funding constraints. Overall, these results are in contradiction to Hypothesis 2 and Hypothesis 4 which predicts firms' investment to decline following the Covid-19 crisis and increase during the post-crisis period.

7.2.2 Retail and Wholesale Industry

The ANOVA test reports high F-statistics and significant results from Model 2) to Model 8). The adjusted R-square increases continuously with each variable incorporated and reaches 2 % in Model 8). This represents a smaller value than in the construction industry and a significantly lower R-square than in the comparable studies by Vermoesen Deloof & Laveren (2013) and Akbar Rehman & Ormrod (2013). However, as the models show a significant F-statistic it can be assumed that the variation in firms' investment is well explained. Model 1) shows a t-statistic of -1.948 and a p-value of 0.052 for the crisis-period, almost being significant at a 5% level. Overall, however, across the models, no statistically significant change in investment both during and after the Covid-19 crisis can be observed. In Model 8), internal finance, external finance, size, growth and cash and cash equivalents all show significant results. All significant variables show positive coefficients indicating that the availability of financing as well as bigger, growing firms with cash and cash equivalents undertake more investment. In contrast to the construction industry, the signs for cash flow, size and cash and cash equivalents assets are positive revealing the differences between the industries. In a similar notion as in the construction industry and in line with previous research exhibits internal finance a bigger coefficient and thus a larger effect on firms' investment. Overall, these results are in contradiction to Hypothesis 2 and Hypothesis 4 which predicts firms' investment to decline following the Covid-19 crisis and recoup in the post-crisis period.

7.3 Interaction Analysis

Regression Model 2) is analyzed to investigate whether the effects of internal and external financing differed during and after the Covid-19 crisis. Two models are constructed: In the first model both financing sources are interacted using the crisis and post-crisis dummy variables. In the second model, all firm-level predictors are added. Table 14a), b) and 15a), b) report the results of the regression for the construction industry and retail and wholesale industry, respectively.

7.3.1 Construction Industry

Table 14a) displays the results of the interaction analysis for the crisis period. In Model 1), it is observed that both funding sources have a significant p-value at $\alpha = 0.05\%$, which is consistent with the previous regressions. No significant interaction coefficients are given for the crisis period, indicating that the effect of the financing sources did not change during the Covid-19 crisis. The analysis of Table 14b) and the interaction effects of the post-crisis period show a statistically significant and negative interaction coefficient for External Finance * Post-crisis at a $\alpha = 0.10\%$ level. This indicates that the effect of external finance on investment declined significantly during the post-crisis period. External finance became a less important determinant for firms' investment in the post-crisis period. On the other side, no significant change in the effect of internal finance on investment during the post-crisis can be observed. While neither effect gained importance during the crisis, the importance of external financing for business investment decreased after the crisis.

7.3.2 The Retail and Wholesale Industry

Table 15a) highlights the results of the interaction analysis for the crisis period. Both financing sources display statistically significant results across the periods. Model 1), displays a statistically significant and positive coefficient for the External Finance * Crisis variable, indicating that the effect of external finance on investment increased significantly during the crisis period. Also Model 2), shows the significant results with the same coefficient. No significance is found for the interaction with internal financing, displaying that the crisis did not affect the impact of internal financing on investment. Analyzing Table 15b), the External Finance * Post-Crisis variable shows a significant and negative coefficient in Model 1) and Model 2), showing that the effect of external financing decreased during the post-crisis period. For both models, the variable Internal Finance * Crisis has no significant coefficient, which means that there was no change in the effect.

7.3.3 Summary

Two somewhat similar results were observed when analyzing the interaction models. In the construction industry, the only coefficient to be significant was External Finance * Post-crisis at a 10% significance level with a negative sign, implying that following the crisis the importance of external financing for firms' investments decreased. All other interaction coefficients showed no significant impact, meaning that besides external financing, the impact of financing sources on investment did not change significantly in the crisis and post-crisis periods. In the retail industry, however, significant coefficients were observed for both periods. The External Finance * Crisis interaction term showed a significantly positive coefficient during the crisis period and a significantly

negative coefficient in the post-crisis period. No empirical effect was observed for the internal finance interaction in both periods. These results indicate that the crisis significantly changed the effects of the financing sources for firms in the retail and wholesale industry. Retailers and wholesalers were more dependent on external financing to fund their investments during the Covid-19 period, while this effect diminished after the end of the crisis. Additionally, it can be observed that the increase of the effect size from external financing on investment during the crisis period is larger than the decrease of the similar effect size in the post-crisis period.

Considering the results in conjunction, it can be concluded, that the Covid-19 crisis affected the impact financing sources have on SME investment. According to Myers & Majluf's (1984) pecking order theory, internal financing is the preferred option for companies to finance any expenditure. Only when this source is exhausted are other options considered. However, as no changes in the impact of internal financing on investment were observed in either industry during either period, it can be concluded that internal financing did not become the prevailing source of financing during the crisis. The impact of external financing during the crisis on investment only became larger in the retail sector, while the impact for both sectors decreased in the post-crisis period. This suggests that external finance is particularly important for SMEs that face liquidity shortages but less important when the economy tends to recede to the equilibrium status. In light of these conclusions, Hypothesis 3 that firms become more dependent on internal financing than external financing during the Covid-19 crisis is therefore rejected.

Conclusion and Further Research

In recent years, European economies faced various crises and have constantly been suffering from their repercussions. SMEs, which form the backbone of the economic system, have almost always been at the forefront of the impact. Their inherent characteristics make them intrinsically more vulnerable to economic shocks than larger companies, and previous research has shown that credit constraints exacerbate the impact in times of crisis. Practitioners and policy makers are very apprehensive about the impact of the current Covid-19 crisis and the consequences the extensive restrictions have on European SMEs. This study is one of the first to examine the financing and investment patterns of SMEs during the current pandemic. It investigated whether SMEs reduced their capital expenditures and to what extent internal and external financing influenced this behaviour.

The paper shows that during the research periods, there was no significant reduction in investment in either of the sectors. It notes, however, that the interaction between financing methods and business investment changed during and after the crisis. Investment by companies in the retail and wholesale industry became significantly more dependent on external financing during the crisis, while this effect decreased significantly in both sectors in the post-crisis period. Additionally, internal finance became

irrelevant for construction firms' investment during the crisis while it remained consistently significant for the retail and wholesale industry.

These results permit to draw conclusions about the source of financing employed for corporate investments. Whereas internal financing seems to be an important factor in times of economic equilibrium, external financing appeared to be an inevitable driver for SMEs' investment in times of crisis. Thus, this finding suggests that those investments made by SMEs during the Covid-19 crisis are more determined by the availability of bank financing than by the availability of internal financing. Furthermore, during the analysis cash and cash equivalents always had a statistically significant and negative coefficient, illustrating the logical relationship that companies with higher cash holdings have fewer resources for investment but a hedged position against uncertainty. The other firm-level variables used in the analysis showed the predicted results with none of them being contradictory.

In summary, the results suggest that policymakers should pay particular attention to ensuring the availability of bank credit for SMEs during an economic crisis to alleviate harmful effects on private firms' investment choices. While this study is not without limitation it is the first step towards understanding the consequences of the Covid-19 pandemic. Future research should investigate why internal financing loses influence during a crisis, especially when external financing is expensive and challenging to access. The question arises whether private companies accept the higher costs of external financing to preserve internal funds for unpredictable demands resulting from the shock? Qualitative research that addresses these questions can provide essential insights, as it has the unique advantage of exploring the motivations of the respective companies and their managers. Moreover, this study was to some extent limited by the data availability. Future research should take a more holistic approach and examine how SME's investment will be affected in the coming years. While current government measures are cushioning the immediate effect of the pandemic, it remains to be seen what the long-term impact will be