KADIR HAS UNIVERSITY
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CORPORATE LEVERAGE, MONOPOLIZATION, ZOMBIFICATION: AN ANALYSIS OF THE U.S. NONFINANCIAL CORPORATE SECTOR

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MASTER'S DEGREE THESIS

ISTANBUL, DECEMBER, 2021

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ACCEPTANCE AND APPROVAL

This study, titled **CORPORATE LEVERAGE, MONOPOLIZATION, ZOMBIFICATION: AN ANALYSIS OF THE U.S. NONFINANCIAL CORPORATE SECTOR**, prepared by the **BERKE SANCAKLI**, was deemed successful with the **UNANIMOUS/MAJORITY VOTING** as a result of the thesis defense examination held on the **27/12/2021** and approved as a **MASTER'S DEGREE THESIS** by our jury.

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To the Working Class who helped me to get to this point…

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CORPORATE LEVERAGE, MONOPOLIZATION, ZOMBIFICATION: AN ANALYSIS OF THE U.S. NONFINANCIAL CORPORATE SECTOR

ABSTRACT

The U.S. non-financial corporations hit record debt levels and leverage ratios even before the COVID-19 pandemic. A recent series of reports, news articles and academic studies show widespread attention to the increasing indebtedness of the non-financial corporate sector and raise concerns about the increases in corporate debt. Using firm-level data from a sample of the U.S. non-financial corporations covering from 1980 to 2019, I find that large firms rapidly increased their leverage ratios without increasing the corresponding level of real investment in last decade. In addition to leverage, most of the outstanding debt is held by very large firms. High profitability and low interest rates allow them higher interest coverage ratios. I also show that leverage is higher in highly concentrated industries and intangible intensive firms, potentially indicating a link between market power and debt levels. Concurrently, although smaller firms face lower leverage ratios, they also have lower interest coverage ratios. A remarkable proportion of firms now become zombie or ponzi units.

Keywords: Corporate debt, capital structure, leverage, concentration, zombie

KURUMSAL ŞİRKET KALDIRAÇ ORANLARI, TEKELLEŞME, ZOMBİFİKASYON: ABD FİNANSAL OLMAYAN KURUMSAL SEKTÖRÜNÜN BİR ANALİZİ

ÖZET

ABD'deki finansal olmayan kurumsal şirketler COVID-19 pandemisinden daha önce rekor borç seviyelerine ve kaldıraç oranlarına ulaştı. Yakın tarihli bir dizi rapor, haber ve akademik çalışma, finansal olmayan kurumsal şirketlerin artan borçluluğuna kapsamlı bir ilgi göstermektedir ve kurumsal borçlardaki artışla ilgili endişeleri yansıtmaktadır. 1980'den 2019'a kadar olan, ABD'deki finans dışı kurumsal şirketlerin firma düzeyindeki verilerini kullanarak, büyük firmaların son on yılda yatırım seviyelerini artırmadan kaldıraç oranlarını hızla artırdığını buluyorum. Kaldıraç oranlarına ek olarak, var olan borcun çok büyük kısmının çok büyük firmalarda toplandığını, yüksek kârlılık ve düşük faiz oranlarının çok büyük şirketlere daha yüksek faiz karşılama oranları sağladığını da gösteriyorum. Ayrıca, kaldıraç oranlarının konsantrasyonun yüksek olduğu endüstrilerde, bilançosunda maddi olmayan varlıkların yoğun olduğu firmalarda daha yüksek olduğunu ve pazar payı ile borç seviyeleri arasında olası bir bağlantı olduğunu gösteriyorum. Daha küçük firmaların daha düşük kaldıraç oranlarına sahip olmalarına rağmen, düşük faiz karşılama oranlarının onların dikkate değer bir kısmını *zombi* veya *ponzi* şirketlere dönüştürdüğünü gösteriyorum.

Anahtar Sözcükler: Kurumsal şirket borçları, sermaye yapısı, kaldıraç, konsantrasyon, zombi şirketler

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BIS	Bank for International Settlements
CCAdj	Capital Consumption Adjustment
Fed	Federal Reserve
FIH	Financial Instability Hypothesis
FRED	Federal Reserve Economic Data
GFC	Global Financial Crisis
ICR	Interest Coverage Ratio
IVA	Inventory Valuation Adjustment
NAICS	North American Industry Classification System
NFC	Non-Financial Corporation
NFCI	National Financial Conditions Index
OECD	Organization for Economic Cooperation and Development
R&D	Research and Development
SIC	Standard Industry Classification

1. INTRODUCTION

The U.S. non-financial corporations (NFCs) faced the pandemic shock with high levels of debt and high leverage ratios. A couple of years of deleveraging after the Global Financial Crisis (GFC), the level of debt and leverage ratios of the NFCs increased rapidly in the last decade. The pandemic shock led to renewed discussions on this issue in both research reports, academic studies and business press. In the aftermath of the GFC, the U.S. economy went through a long period of low inflation and low interest rates. According to the former Fed Chair Yellen "the long-term persistence of low-interest rates could lead to undesirable increases in leverage and other financial imbalances" (2017). More recently, the financial stability reports issued by the Fed frequently highlight that the debt owed by the NFCs reached historically high ratios with respect to the GDP and pointed out that "the high level of business-sector debt is likely to amplify the adverse effects of the COVID-19 outbreak" (2020a, 33).

Before the GFC, the NFCs' total debt was $6.3 trillion at the end of 2007 and 44% of the GDP. However, after deleveraging a couple of years following the GFC, NFCs began to re-leverage, and the sector's level of debt reached $10.1 trillion and 47% of the GDP in 2019, an all-time high. Furthermore, the Fed highlighted in the Financial Stability Report (2019b) that the fastest growing asset class, 14.6%, was leveraged loans in the term between 2018 Q2 and 2019 Q2. In this report, due to increasing leveraged loans, private credit and triple B- rates bond, corporate debt is frequently cited as a potential concern in the Fed survey. The May issue of Financial Stability Report (2020a) pointed out that the fastest-growing asset class, 26.4%, was equities this time in the term between 2018 Q4 and 2019 Q4. Again, in this issue, increasing holdings of corporate debt by mutual funds comprise vulnerabilities in the Fed survey in terms of potential concerns on recession.

Another point stressed by the New York Fed was that high levels of corporate debt, which rivals mortgage-backed securities, especially the BAA rated, might threaten financial

stability as well.[1] Growing public concerns regarding corporate debt received attention from both regulators and investors. One concern was that the critical vulnerability resulting from *junk* corporate debt and those increasingly held by mutual funds might prolong the next recession and bankruptcies.[2] [3] Moreover, carrying a higher risk of those bonds, which is about 60% of total bonds, comes due over the next five years.[4]

There are a number of different approaches to high levels of NFC debt. Some analyze the increase in leverage from the perspective of capital structure theories. DeAngelo and Roll (2015) and Graham et al. (2015) show an increase in leverage for the post-WW-II era. The increases in leverage are mostly concentrated among the unregulated firms, and increased leverage is associated with increases in tax rates and growth of financial markets (Graham, Leary and Roberts 2015). A number of studies show the negative effect of profitability on leverage (Fama and French 2002; Frank and Goyal 2015; Eckbo and Kisser 2020). Some papers find a positive relationship between capital stock and leverage as well as between firm size and leverage (Frank and Goyal 2009; Eckbo and Kisser 2020). Last but not least, there has been growing importance on the positive relationship between intangible assets and leverage (Gill and Heller 2019; Lim, Macias and Moeller 2020).

A number of studies on zombie firms and Minskian fragility emphasize an increase in debt and associated risks. On the zombie side, McGowan et al. (2018) and Banerjee and Hofmann (2018; 2020) show the increases in the number of zombie firms in developed economies and note that the zombie firms are less productive than the non-zombie firms and harm more productive firms by creating the market congestion. On the Minskian side, Pedrosa (2019) and Davis et al. (2019) show the dramatic increase in Ponzi firms, especially among the small firms in the U.S. economy. However, Pedrosa (2019) argues

[1] Nina Boyarchenko and Or Shachar, January 8, 2020 (https://libertystreeteconomics.newyorkfed.org/2020/01/whats-in-aaa-credit-rating.html)
[2] David J. Lynch, November 29, 2019 (https://www.washingtonpost.com/business/economy/corporate-debt-nears-a-record-10-trillion-and-borrowing-binge-poses-new-risks/2019/11/29/1f86ba3e-114b-11ea-bf62-eadd5d11f559_story.html)
[3] Susan Lund, June 21, 2018 (https://www.mckinsey.com/mgi/overview/in-the-news/are-we-in-a-corporate-debt-bubble)
[4] Mark Kolakowski, February 20, 2019 (https://www.investopedia.com/why-the-corporate-debt-bubble-may-burst-sooner-than-you-think-4587446)

that the relation between aggregate leverage and financial fragility does not account for the general outcome because of the frequency of speculative and ponzi firms. Similar analyses are done for Brazilian electricity distribution firms (Filho, Martins and Miaguti 2018) and Japanese NFCs (Nishi 2019).

Rises in leverage and associated risk are also linked to other recent trends such as financialization, stock buybacks, market concentration and increased uses of intangible assets literature. Higher levels of debt may increase vulnerabilities and may eventually have a negative effect on investment (Orhangazi 2008a; 2008b), and financialization, in general, slows down capital accumulation processes (Stockhammer 2004). The increases in firms' borrowings are linked to increases in shareholder payouts (Mason 2013; 2015; Davis 2016; 2017a; 2018) and financial assets accumulation (Davis 2017b). A recovery in profitability without increasing the corresponding level of real investments are linked to increased uses of intangible assets (Orhangazi 2019), and increases in market concentration might be resulting from increases in intangible assets accumulation (Davis and Orhangazi 2021) and corporate leverage (Baines and Hager 2021).

The main question of this thesis is whether it is possible to identify certain firm and industry characteristics that are associated with higher debt and leverage and look at how firms use the cash flow coming from debt. To that end, I analyze the publicly listed U.S. NFCs by using Compustat database. My findings are as follows: NFCs' total debt is distributed unequally among the firms. Most of the outstanding debt is concentrated among very large firms. These firms have higher interest coverage ratios enabled by high profitability and low-interest rates. Leverage is higher in highly concentrated industries as well as among intangible-intensive firms that potentially indicate a link between market power and debt levels. On the other end of the distribution, whereas smaller firms have lower leverage levels, they also have lower interest coverage ratios. As a result, a large proportion of firms now appear as *zombie* firms or *ponzi* units.

Econometric analyses show that there is no uniform explanation covering all firms regardless of their firm size and industry characteristics in terms of determinants of leverage. The main findings of the econometric analyses are as follows. The impact of internal funds in determining leverage decreases over the periods and is smaller for large

firms. Fixed capital accumulation has a lower impact on leverage for large firms than small firms. Intangible asset accumulation has a larger impact on middle size firms than other firms. An increase in shareholder payouts has a larger impact on leverage for larger firms.

Based on these findings, it is possible to argue that uneven distribution of NFCs' debt leads to unequal accumulation and unequal consequences. While large firms enjoy benefitting abundant and cheaper external sources and increase or sustain their profitability and shareholder payouts without increasing corresponding level of real investment, small firms face a higher cost of external sources that eats into internal funds, deteriorate firms' balance sheets, increase financial fragility and zombification, depress profitability and real investment activities. This uneven distribution of debt increases entry barriers and eventually promotes market concentration.

The thesis is organized under two main questions: Why do firms borrow? What are the possible consequences of increasing debt? The importance of these questions is already addressed above. The decision of borrowing does not only change the leverage of the firm but also changes the characteristics of the economy. Even before the Covid-19 outbreak, the NFCs already had record ratios of debt as a percentage of the GDP as discussed by a number of studies. The covid-19 outbreak has increased the concerns on this issue. Almost 50% of the total U.S. value added consists of the NFCs according to the Integrated Macroeconomic Accounts[5] provided by the Bureau of Economic Analysis, and as such focusing on the NFCs is crucial in understanding macroeconomic trends and tendencies.

The rest of this study is structured as follows. In Chapter 2, I review the literature on corporate debt in relation to the two questions posed above. I begin with capital structure theories such as the Modigliani and Miller theorem, the trade-off theory and the pecking order theory and then review financing constraints arguments, as a bridge connecting orthodox theories to heterodox theories, the post-Keynesian theories and the financialization literature and finally review the most recent corporate debt studies. This

[5] Table S.2.a Selected Aggregates for Total Economy and Sectors. (https://apps.bea.gov/iTable/iTable.cfm?reqid=14&step=1#reqid=14&step=3&isuri=1&1403=6206)

review also shows how firm's objective, the importance of assumptions and conflict between manager and shareholder can affect the firm financing and investment decision.

In Chapter 3, I present aggregate descriptive statistics for all sectors and then focus on the trends in the nonfinancial corporate sector using Financial Account of the U.S. data (i.e., formerly known as Flow of Funds). I also document the interest coverage ratio (ICR), profitability and investment rate of the NFCs as well as their financial payouts. The link between borrowing and stock buybacks, sources and uses of funds, holdings of debt and composition of debt of the NFCs are also discussed in this chapter.

I turn to firm-level data and firm-level analysis in Chapter 4. Using Compustat data for a sample of publicly-traded U.S. firms from 1980 to 2019, I find an uneven distribution of debt among firms and present selected ratios in order to link aggregate and firm-level data. I document the leverage of firms by firm size, firm age, industry, concentration groups and type of asset held by firms. Regression analysis on the determinants of leverage is also presented in this chapter. A baseline model is used for all firms and related periods. After that, regression analysis is run for firms according to size and industry classifications. Summary of findings on regression analysis is documented in this chapter as well.

Chapter 5 is devoted to zombie or ponzi firms. In this chapter, I describe the Minskian firm classification known as *hedge*, *speculative* and *ponzi*, show distribution of debt and leverage ratios by Minskian classification, present distribution of ponzi firms by firm size, age, concentration groups and industry level. I define firms as zombie or ponzi that could not cover their principal and interest payments with their sources of cash.

Finally, I conclude with Chapter 6, where I gather all conclusions performed in the previous chapters and interpret the implication of findings.

2. LITERATURE REVIEW

This review is framed under two main questions in connection with my central argument in Chapter 1. First, why do firms borrow? Second, what are the possible consequences of debt? The importance of these questions was already addressed above in Chapter 1.

In this chapter, I document three significant contributions to both economics and finance literature. The chapter is split into four parts so as to clearly show the evolution of the fields and thus make a possible connection among them. The main arguments of the capital structure theories and its sub-categories, which are Modigliani-Miller theorem, trade-off theory and pecking order theory, are reviewed in the first part of the chapter. The second part of the chapter is divided into two sections. First, I review the literature on financing constraints of firms related to asymmetric information. Second, I review the literature on rising risk in connection with debt according to the post-Keynesian theories of firm and investment. In the third part of the chapter, I examine the broad understanding of the financialization arguments, especially on the NFCs' debt, and finally, the recent developments on NFCs' debt will be presented, especially after the GFC.

This literature review answers these questions stated above as follows. According to the capital structure theories, firms' primary objective is market value maximization, and thus firms borrow for maximizing their market value. However, this maximization process varies under different approaches within the capital structure theories. The firms borrow for targeting an optimal debt ratio (Stiglitz 1972; Frank and Goyal 2008), reducing free cash under managers' control, increasing efficiency by disciplining the firm (Jensen 1986) and financing deficits (Myers and Majluf 1984) motivated by maximization of market value, whereas firms face deadweight financial distress cost or even bankruptcy (Frank and Goyal 2008), increase the probability of defaulting (Harris and Raviv 1991), lead to underinvestment problem (Stulz 1990) due to increasing debt and debt-related payments. In the post-Keynesian theories, firms' main objective is power or survival under fundamental uncertainty (Lavoie 2015). Firms borrow if the level of investment demand exceeds its internal funds (Fazzari and Mott 1986). Borrowing and investment demand are linked to each other for pre-1980s (Mason 2015). However, new borrowings are linked to financial asset accumulation (Davis 2017b), shareholder payouts (Mason 2015;

Fiebiger 2016; Davis 2017b) and intangible asset accumulation (Orhangazi 2019). The debt also leads to macroeconomic fluctuations in investment by reducing internal funds (Fazzari, Hubbard, et al. 1988b), reduces managerial autonomy (Crotty 1990), deteriorates firms' balance sheet and thus creates vulnerabilities (Palley 1996), increases cash commitments, fragility and instability (Minsky 1975; 2008), negatively affects fixed investment (Orhangazi 2008a; 2008b).

2.1 THEORIES OF CAPITAL STRUCTURE

In finance, capital structure theories refer to how firms finance their investment activities in order to maximize firms' market value (i.e., maximizing shareholder value) through a combination of equities and debt. The investment activities are not specifically defined by these theories. Briefly, the projects which maximize firms' market value are defined as investment activities in related literature. Most of the studies focus on these decisions and their effects on the whole economy made by firms (Myers 2001). Since there is no universal consensus, capital structure theories state only framework of related family theories (Frank and Goyal 2008). Following the previous literature, I divide these related theories into three sub-categories. First, starting with the Modigliani and Miller theorem so-called "irrelevance proposition", I begin to review the initial point of modern finance because there is no widely accepted argument before them regarding capital structure theories (Frank and Goyal 2008). Second, by adding another layer, relaxing a strict assumption, I review the trade-off theories. Finally, I present the pecking order theories. I follow surveys done by Harris and Raviv (1991), Frank and Goyal (2008), Graham and Leary (2011), Ai et al. (2020) and Frank et al. (2020) by reviewing capital structure theories.

2.1.1 The Modigliani-Miller Theorem

Over the last six decades, capital structure theories have been widely discussed, and various scholars made contributions to the literature both theoretically and empirically. Modigliani and Miller (1958) can be considered as a starting point of the modern capital

structure theories in this respect. In this study, Modigliani and Miller note that the firms borrow in order to maximize their market value.

Modigliani and Miller (1958) make strict assumptions. These assumptions describe a world with no taxes, no bankruptcy costs, no imperfect markets etc. Under these assumptions, they reach a number of propositions. The most referential proposition is that the value of the firm is independent of the proportion of debt or equity finance. That is to say, market value of firms is irrelevant to their leverage level and not influenced by their financing decision (Modigliani and Miller 1958).

This paper subsequently generated discussion on the restrictive assumptions made by the initial paper and led to a revision. Once taxation assumption is relaxed, Modigliani and Miller (1963) suggest that debt financing is better than equity financing in which the world with corporate tax. Since corporate tax is interest deductible, and debt financing includes interest, firms gain interest tax shield with debt financing. Based on this, one might possibly say that the firms' market value increases as much as deducted tax increases. Hence, the market value of the firm is affected by its financing decision. Given the fact that there is no bankruptcy cost, which is debt holders claimants cost such as lawyer's fees, filling fees, legal and accounting fees etc., one might say that firms must prefer full debt financing (Frank and Goyal 2008). The next part of the chapter is dedicated to review the trade-off theories of debt, by relaxing no bankruptcy cost assumption.

Although the following capital structure theories have been influenced by the Modigliani-Miller theorem throughout the decades, they consider more realistic assumptions trying to understand why financing matters for the maximizing market value of the firm (Frank and Goyal 2008). Unlike the Modigliani-Miller theorem, the following sub-category considers that there is a limit for debt financing. Despite the fact that firms enjoy benefiting interest tax shield, at the same time, there is a bankruptcy cost because of the growing debt amount that affects the market value of the firms. As leverage of the firm increases, the probability of defaulting increases (Frank and Goyal 2008).

2.1.2 The Trade-off Theory

The principal idea behind the trade-off theory is that, as the name suggests, there is a trade-off between debt interest tax shield and the bankruptcy cost. By relaxing Modigliani and Miller's no bankruptcy cost assumption, firms optimally target and balance their debt level as well as their leverage. That is to say, firms borrow up to a target level that tax benefits are greater than the bankruptcy costs motivated by maximizing the market value of the firm. The theory is based on two fundamental issues. First, according to Stiglitz (1972), the cost of bankruptcy is likely to intimidate the firms to limit borrowing as stressed above. Second, Jensen and Meckling (1976) point out that the agency cost, which is a conflict of interest between investors and managers, is also as real as other costs. Firm managers are the representatives of the shareholders, but their interests are not always the same for the shareholders (Jensen 1986).

Managers act in their own interests so as to obtain higher compensation and other benefits. This forces them to spare more available cash in balance sheet and distribute less to shareholders. Since payouts decrease the available sources under managers' control and weaken their power, managers keep free cash under their control. Managers also gain power when the firms grow. Even so, growing firms generate more sources under managers' control, and there is a positive relationship with the managers' compensation. According to the theory, in order to control manager, firms issue debt securities to reduce free cash flow. Otherwise, this free cash is invested inefficient projects or wasted by manager and thus decreases the market value of the firm (Jensen 1986).

According to the theory, the debt plays a prominent role to control managers. Two major factors can be addressed. First, issuing debt reduces available sources under managers' control. Increasing interest payments reduce free cash in balance sheets and restrict managers from investing in low-return projects or prevent them from wasting it. Second, the growing amount of debt forces the firms to be more efficient and helps to set organizational incentives. To meet debt service payments under threat of failure, managers are forced to make the organization to become more effective. Issuing debt to buyback shares also helps to build up needed organizational incentives. The stock buybacks by issuing debt also have a tax advantage since interest payments of firms are

tax-deductible, and this corresponding buyback is not taxed (Jensen 1986). However, there is a limit to borrow. He notes that the increased debt ratios also increase the bankruptcy cost given firms motivated by market value maximization.

Empirical tests of the trade-off theory go back to the late 1970s. The trade-off theory, as I addressed above, emphasizes the tax benefits of debt and the cost of bankruptcy. Therefore, the theory suggests that there is an optimal leverage ratio for firms. Using aggregate U.S. data, Frank and Goyal (2008) show that leverage is stable over time. The stability behind this situation might be resulting from the definition or measurement of the variable. Taggart Jr. (1985) finds that the U.S. corporate leverage increased in the post-World War II period. He emphasizes that the measurement technique changes the appearance of the trend. Even so, market leverage and book leverage, two main measurement methods, are different from each other, and there is a debate on which one should be used. Myers (1977) suggests using book values as the best descriptor for growth opportunities, but Welch (2004) encourages using market values by estimating leverage. The main difference between book and market values is based on the pricing of assets. Book values use historical prices (i.e., backward-looking), whereas market values use market prices that are forward-looking (Frank and Goyal 2008).

Early studies estimating target debt ratios such as Taggart Jr. (1977), Jalilvand and Harris (1984) and Shyam-Sunder and Myers (1999) find that firm leverage is unchanged over time. Frank and Goyal (2009) show that both market values and book values of leverage provide robust results. Frank and Goyal (2009; 2008) also show reliable factors so as to explain determinants of the market leverage. They present six core factors that determine leverage as follows: 1) Median industry leverage has a positive effect on market leverage. 2) High market-to-book asset ratio (i.e., interpreted as growth opportunities) has a negative effect on leverage. 3) The firms with more tangible assets have more leverage. 4) The firms with more profits have less leverage. 5) Size of the firm with respect to book assets has a positive effect on leverage. 6) There is a positive relationship between expected inflation and leverage as well.

Graham et al. (2015) analyze NFCs by splitting them into two sectors, regulated and unregulated, and find that there is stable leverage in regulated sectors (i.e., utilities,

railroads, telecommunications) as opposed to unregulated (i.e., rest of) sectors. They stress that the stable leverage ratios in the U.S. regulated sector masked the secular increase in unregulated sectors in terms of leverage. In addition to this, Graham et al. (2015) find unclear evidence of tax effects, which is consistent with Rajan and Zingales (1995) and Myers' (2003) findings. Furthermore, Graham et al. (2015) have also examined the effect of the interest rates and find a positive relationship between interest rates and leverage, which is consistent with the theoretical background of trade-off theory, since higher interest rates are related to greater interest tax shield.

Frank and Goyal (2009) indirectly support the positive relationship between interest rates and leverage. Since they addressed that there is a positive relationship between expected inflation and leverage, expected inflation is associated with the interest rates (Ai, Frank and Sanati 2020). Ai et al. (2020) underline that the trade-off theory does not clarify the complete story. However, the dominant idea in capital structure theories, both in teaching and research, is still the trade-off theory. As I presented above, the findings on the same topic are controversial. Meaning that, there is no consensus on explaining leverage even within trade-off theory itself. All in all, the trade-off theory, as exhibited above, is mainly based on the benefit of the tax and cost of the bankruptcy in order to maximize firm value.

2.1.3 The Pecking Order Theory

Modigliani and Miller (1958) have made strict assumptions such as no taxes, no bankruptcy costs and no imperfect markets. Modigliani and Miller (1963) have relaxed the no taxes assumption and led to a revision. In this respect, it is shown that the full of debt financing due to interest tax shield maximizes the firm's market value. However, after relaxing the "no bankruptcy cost" assumption (Stiglitz 1972), it is seen that there is a limit to borrow. The firms maximize their market values by targeting an optimal debt ratio, up to a point that tax benefits are greater than the cost of bankruptcy. Simply, this was the origins of the trade-off theory. Here, by relaxing the no imperfect market assumption, the pecking order theories emerged. In this theory, firms borrow to finance their financing deficits. These financing deficits can be due to capital expenditures, dividends and changes in the working capital etc. (Frank and Goyal 2003). The pecking

order theories are mainly based on the adverse selection model motivated by indirectly maximizing the market value of the firm.

The adverse selection model is based on the information asymmetry between firms' management and outside investors. It is assumed that the managers know more about firms' potential value of their assets and future opportunities, and outside investors only predict the value of their assets and opportunities. To invest in valuable projects, the firm can issue debt or equity. However, since there is information asymmetry between managers and investors, investors might misprice the investment signal. Issuing debt or share might be interpreted as bad news, and thus firm value might reduce. This problem arises issue-invest decision. If the firm passes valuable projects due to adverse selection, again, the firm value might decline. Therefore, adverse selection implies a financing hierarchy, the pecking order (Myers and Majluf 1984).

Myers (1984) is treated as the starting point of the pecking order theory in the relevant literature. He stressed that there is a ranking between financing decisions referred by the adverse selection model. He implies that retained earnings are less costly than external debt, and external debt is less costly than equity financing given information asymmetry. That is to say, firms prefer, first, internal sources then external debt and equity financing as a last resort so as to finance their financing deficits to maximize firm value. This ranking comes from different sources such as asymmetric information, agency conflict and taxes (Frank and Goyal 2008).

In his work, Myers emphasizes that so far how firms decide on their capital structure question is unclear. However, he lists five facts on corporate financing behavior. These stylized facts are as follows: 1) Investments are overwhelmingly financed by internal sources. 2) Timing of issuing security is valid. 3) The firms which hold precious intangible assets tend to borrow less than others. 4) Firms prefer to exchange debt for equity while stock prices rise and vice versa. 5) When stock prices rise, firms prefer stock buyback. When stock prices fall, firms announce a stock issue (Myers 1984).

A form of the agency theory is the next factor forming pecking order theory. As shown in detail in the trade-off theory part, Jensen and Meckling (1976) and Jensen (1986) are

the scholars who contributed to the agency theory. In this theory, potential investors require detailed information on projects invested, and this should require monitoring (i.e., bond covenants etc.) the management. The monitoring process of the management is costly. Thus, management prefers not to be monitored and would like to use retained earnings first (Frank and Goyal 2008). As a result, the existence of agency cost might force management to follow pecking order theory in some cases (Myers 2003).

Testing pecking order theories of corporate financing go back to the 1990s. Shyam-Sunder and Myers (1999) test U.S. firms and find strong relationship between net debt issues and the pecking order. Frank and Goyal (2003) find contrary findings for the pecking order theory. Equity issuing is more related to financing deficits than net debt issues for small firms. However, there is evidence that that large firms might be following pecking order behavior in this respect. This result might be interpreted as low adverse selection cost among large firms since more information covers those firms (Frank and Goyal 2008).

Fama and French (2002) find consistent evidence with pecking order theory and show that the firm, which has been more profitable and making less investment, have distributed higher dividend payouts which have been consistent with pecking order theory and inconsistent with simple trade-off theories. As a result, those firms have lower leverage ratios. Similar results were found by Harris and Raviv (1991), Frank and Goyal (2009) and Eckbo and Kisser (2020). In relation to that, Kester (1986), Titman and Wessels (1988) and Frank and Goyal (2015) find an inverse relationship between leverage and profitability. A negative correlation between leverage and profitability is an important fact to validate pecking order theory against trade-off theories (Frank, Goyal and Shen 2020). However, Frank and Goyal (2015) emphasize that this finding does not come from theory but comes from its usage.

Lemon and Zender (2010) show consistent findings with pecking order theory, such that internal funds are seen as preferred financing sources for all firms, and if risky sources are required, and there are no debt capacity or financing constraints concerns, firms prefer to have debt to equity financing. However, if debt capacity is *reached*, they issue equity for financing. Moreover, Leary and Roberts (2010) test pecking order theory by

considering hierarchical order and found that the data used show 67% of firms' financing decisions are internal 23% of are debt and 7% of are equity.

Like trade-off theory, the pecking order theory does not provide a full understanding of how firms choose between using internal or external financing sources. That is to say, the problem is not unique for the pecking order theory. As Frank et al. (2020) highlight that the more the theory is interpreted, the greater challenge seems to have followed to the empirical side of the studies. To sum up, the pecking order theory might explain some aspects of the data and is not fully rejected. Some stylized facts exhibit consistent evidence for pecking order. Some do not provide as in trade-off theory. As a result, empirical and theoretical works are still studied from both perspectives. Both theories still have some missing or unclear parts, which are to be improved in future research as well (Frank, Goyal and Shen 2020).

2.2 FINANCING CONSTRAINTS AND RISK

This part of the chapter is divided into two sections. The first section is dedicated to present the financing constraints argument on firms financing and investment decisions based on asymmetric information/adverse selection. With reference to financing hierarchy (i.e., the pecking order) and imperfect market assumption, an alternative research agenda will be reviewed. The second section is devoted to the increasing risk regarding the firm indebtedness in line with the post-Keynesian theories of the firm and investment. In the first section in this part, again, firms borrow to finance their valuable investment projects motivated by maximizing shareholder value. However, in this alternative approach, investment is mostly considered as the fixed asset accumulation (i.e., plant, property and equipment) (Fazzari, Hubbard, et al. 1988b).

Under Modigliani and Miller' (1958) conditions, there is no tax, no bankruptcy cost and no imperfect markets, a firm's capital structure is irrelevant to its investment decisions, and any valuable projects can be undertaken motivated by the maximization of shareholder value. Given perfect market assumption, external funds are perfect substitutes for internal funds and thus investment decisions and firm value are independent of its

capital structure. However, given the existence of asymmetric information, external and internal funds are not perfect substitutes. In line with the pecking order theory, internal funds are less costly than external funds, and investment spending might be affected by the availability of internal funds (Fazzari, Hubbard, et al. 1988b). All in all, Fazzari and Athey (1987) and Fazzari et al. (1988b) note that firm's investment and financing decisions are linked to each other.

According to Fazzari and Athey (1987), firms likely suffer from asymmetric information. They emphasize that if a firm has enough internal funds from ongoing operations in order to finance its investment, it does not employ or seek any external funds. However, if internal funds are exhausted, then firms seek external funds to finance investment projects. Again, the cost of external funds under asymmetric information is higher than the internal funds, and thus firms may forego desirable investment projects. Briefly, firms cannot undertake all valuable investment projects under asymmetric information. Internal funds constraint investment directly (Fazzari and Athey 1987; Fazzari, Hubbard and Petersen 1988a; 1988b). This is the baseline of the financing constraints argument. Moreover, Fazzari et al. (1988b) test their arguments by classifying firms into three groups and show that there is no representative firm (i.e., heterogeneity of firms), and using retained earnings (i.e., retention ratio) to finance investment projects differs by size, capital stock intensity and industry. They conclude that when internal funds decrease, it may reduce investment rather than issue external funds and hence increase the significance of financial constraints for macroeconomic fluctuations in investment.

The second section of this part of the chapter is dedicated to increasing risk as a result of debt financing. The post-Keynesian theories of investment are based on fundamental uncertainty. Investment decision primarily depends on the firm's demand expectations and capacity utilization under fundamental uncertainty (Fazzari and Mott 1986). In addition to this, unlike previous theories, the firm main objective is not maximizing its profits or value but *satisficing* the profits owing to uncertainty. The term *satisficing* is a combination of the words *satisfy* and *suffice* (Lavoie 2015). The goals of firms are to seek satisfactory level of overall performance, production, share of market, public image rather than maximizing profits, sales etc. (Koutsoyiannis 1975). Lavoie (2015) summarizes the firm's objectives as follows: 1) power is the ultimate objective. 2) To obtain power, firm

must grow. However, Lavoie (2015) does not underestimate the role of profits for the firms. He notes that "profits are means rather than ends" (128). Even so, he emphasizes that profits are targeted for obtaining the firm's objectives, which is survival of the firm and hence increasing its power in the market under fundamental uncertainty.

Contrary to the post-Keynesian theories, in Modigliani and Miller theorem, under certainty, firms can predict the potential projects (i.e., positive net presented value projects), which are profitable for the firms in the future, and under perfect market, they obtain all financial capitals required to finance these projects (Lavoie 2015). However, the world with uncertainty, survival is the main objective of firm resulting from uncertainty as stressed above, and survival requires market power which is the main concern in the post-Keynesian theories (Shapiro and Mott 1995). Dunn (2005) highlights that the firm "is a strategic institution for coping with, or getting rid of, market uncertainties" (94) and thus making strategic planning is a response to uncertainty. Davies and Lee (1988) point out that this strategy to ensure continuity can be "a degree of control over firm's environment through research and development (R&D), market development, interfirm cooperation, entry deterrence" (21).

The other important objective of the firms is growth. Growth is the only means to reach the ultimate objective, the power. Having power in the corporate world, firms must be big (Lavoie 2015). To become big, firms must grow. If a firm objective is profit maximization, firm should first maximize the rate of growth (Lavoie 2015). That is to say, survival and growth are related to each other in opposition to previous theories. Several economists also share the same vision on the objective of the firm such as Galbraith, Chandler, Marris, Robinson etc. cited in Lavoie (2015, 132-133). As addressed above, the role of the post-Keynesian firm is not to target profit maximization but to obtain power by expanding the firm. However, there are constraints on growth. Similar to the pecking order theories and financing constraint arguments, retained earnings (i.e., internal funds) play an important role to maintain firm's activities (Mott 2010).

Significant contributions are also made by Crotty (1990), in his work, Crotty emphasizes that the objectives of managers and shareholders are different. Managers try to maximize firms' growth, whereas shareholders maximize the short-term capital gains. This conflict

between them changes the behavior of the firm in terms of investment behavior. This change comes from the different objectives of owners and managers. Crotty (1990) argues that maximizing short-term gains is done under two strategies by owners. First, selling firms to a potential buyer who will pay a premium above current market value. Second, forcing managers to distribute extraordinary dividends or stock buybacks by raising money through borrowing. These strategies both end up with disasters. As a result of these strategies, he notes that "the sale of firm often costs the current management its control of the corporation. The second strategy represents the looting the company and the destruction of its long-term prospects for growth and profitability" (539). All in all, he concludes that the owners and managers are not identical economic agents in terms of objectives.

As stressed above, profits are only the means to expand firms. Thus, profits and expansion of firms are interdependent. Even so, increasing profits help grow the firm, and the growth help firm to be profitable. This mutual relationship between profits and growth of firm is crucial for the post-Keynesian theories. In the post-Keynesian theories, under firm's objectives, Lavoie (2015) notes that "…firms will dare to borrow only to the extent that they have been accumulating their own means to finance investment…" (137) and highlights the limit of borrowing "…a firm can or is willing to borrow only limited amounts, related to its previously accumulated internal funds…" (137). This is also known as the *principle of increasing risk* quoted by Kalecki (1937). The intuition behind this is to answer determination of size of investment undertaken by a decision maker. According to Kalecki (1937), there are two reasons affecting amount of investment. First, as level of investment increases, wealth of decision maker may endanger in the event of undesirable environment. Second, as level of investment increases, marginal risk rises with the amount invested. In the event of sudden need for capital, the assets, perceived as *liquid*, might turn out to be *illiquid*. In this case, decision maker borrows at a rate of interest higher than market interest rate.

In addition to the above notion, in line with Kalecki's (1937) principle increasing risk, as the level of investment increases, exceeding planned investment level financed with internal funds or in case of inadequate internal funds, external funding will be used and thus cost of external funding will rise and create interest obligations for the firms (Fazzari

and Mott 1986). Even so, lenders eventually demand higher interest rates, as level of investment increases (Mott 2010). Fazzari and Mott (1986) note that "the marginal risk of fixed capital investment rises with the level of investment" (174). This phenomenon can also be similarly found in Keynes's (1936) *lender's and borrower's risk*. In these approaches, unlike other theories, limitations of borrowing are not a one-sided issue. Firms are willing to borrow if lenders or other parties are willing to lend them. Lavoie (2015) summarizes that excluding periods of crises, firms can borrow as much as they desire within their limitations set based on their internal funds. However, during a crisis period, firms are constrained by the leverage ratio that is acceptable by lenders.

The ideas, *Keynes's risk and Kalecki's risk*, presented above, are extended by Minsky. Financing hierarchy or the pecking order ideas are presented by Kalecki and Minsky before the pecking order theorists (Fazzari and Mott 1986). The early studies of Minsky laid the foundations of his financial instability hypothesis, and his insights started to attract *mainstream* attention during the debt explosion in the mid-1980s (Palley 1996). Minsky (1975) argues that the internal cash flow and cash commitments are key determinants of the firms to finance investment. As Minsky (1972) notices that the structural characteristic of the system such as periods of expansion and economic boom era pose the stability of the system. During buoyant times (i.e. period of *tranquility*), as risk perception decreases, future expectations of the investors become optimistic, and financial constraints are unwound. This optimism in the real sector increases real investment and willingness to borrow. On the other side, financial sector is willing to lend and easing the lending conditions during the same time (Palley 1996).

Concurrently, these buoyant periods, such as before the GFC, are also justified by market participants and validated by the optimistic expectations that *this time is different*. All market participants forget the past events, and this is one of the key components of Minsky's financial fragility hypothesis (Lavoie 2015). Debt to equity ratio and debt coverage ratio are progressively deteriorated and reflected the firm's balance sheet, meaning that there is a financial fragility growing inherently. This ends up with the failure of meeting debt obligations, or these circumstances create a vulnerable economy to be affected by small negative shocks (Palley 1996). Minsky (1972; 1992; 2008) classifies firms into three units, *hedge* unit, *speculative* unit and *ponzi* unit. This classification is

based on their capacity to meet financial obligations. Hedge firms can generate available sources more than their interest and principal debt payments. Speculative firms can meet their interest payment but must borrow to roll over their principal debt payments. Finally, ponzi firms cannot generate sufficient cash flow to meet their neither interest payments nor principal debt payments.

Empirical evidence above arguments is split into two parts. The first part, the shared vision on financing and investment constraints are presented under Keynes and Kalecki's framework. Fazzari and Mott (1986) analyze the determinants of investment and find that the financing constraints play a critical role of investment from the perspective of Keynes and Kalecki. They note that "internal finance is quite important for explaining why different firms invest different amounts at any point in time" (184). They also point out that interest payments and capacity utilization play an important role in determining borrowing and investment. Similar results are found by Ndikumana (1999), Brown et al. (2009) and more recently Medlen and Chen (2020).

The second section is devoted financial fragility hypothesis in line with Minskian framework. Theoretical works using Minskian approach have been conducting almost 40 years. However, very limited empirical work recently analyzed the firms arming Minskian interpretation of the *Financial Instability Hypothesis (FIH)* by deploying Minskian typology (i.e., hedge, speculative and ponzi). Mulligan (2013), Filho et al. (2018), Nishi (2019), Davis et al. (2019), Pedrosa (2019) employ the Minskian interpretation of FIH and address the growing fragility.

To sum up, in post-Keynesian theories, there is no representative firm. The objective of small and large firms is different. However, the firm, regardless of size, wants likely to control future events. Therefore, in general, the firm main objective is power or survival. To have power, the firm must grow. Even so, unlike profit maximization, firms maximize growth. In these theories, internal funds and external funds are complements to retained earnings rather than substitutes (Lavoie 2015). Firms first exhaust internal funds and then seek external funds to finance their investments (Fazzari and Athey 1987). Therefore, as investment increases, the level of external funding increases and creates an obligation to firms (Kalecki 1937). This allows the lenders to demand higher interest rates, as

investments increases (Mott 2010). However, increasing debt-financing increases profits and encourages to increase leverage during good times. As the portion of debt-financing increases, debt reduces available cash and increases cash commitments and thus increases fragility, which is the key feature to finance investment (Minsky 1975).

Inherently deteriorated firm's balance sheet ends up with the failure of meeting debt obligations or creates vulnerabilities affecting from small negative shocks (Palley 1996). Firms can meet financial obligations by selling their assets or borrowing more. If these actions become a general attitude, asset prices drop severely in the absence of active intervention (Minsky 1975). All in all, increasing level of debt causes increasing fragility, instability, debt deflation and crisis (Lavoie 2015).

2.3 FINANCIALIZATION

Increasing size and importance of the financial system in advanced economies is frequently referred to as financialization. Although there is no consensus on the definition of financialization, it is more generally defined as the "increasing role of financial motives, financial markets, financial actors and financial institution in the operation of domestic and international economies" (Epstein 2005, 3).

Besides the increasing size and scope of the financial sector in the whole economy, Krippner (2005) emphasizes that changing behavior of the NFCs and actors in macroeconomy are also important figures. Nevertheless, the common usage of the definition of financialization and the studies conducted on it might be considered as an expansion of finance, which is a crucial feature of the capital accumulation of the post-1980 U.S. economy (Davis 2017b).

Orhangazi (2008a) draws attention to the relationship between non-financial corporate sector and financial markets and points out that the relationship between them has become more complex. His usage of the word financialization expresses the changing relationship between non-financial corporate sector and financial markets over the last 30 years. Evidence in large NFCs shows that some large NFCs resemble financial firm behavior

and a growing complex relationship between NFCs and the financial sector is observed during this time as stated by Froud et al. (2006).

Early studies on financialization are mainly about the link between financialization and fixed investment of the NFCs. The negative effect of financialization on investment is found (Stockhammer 2004; Orhangazi 2008a; 2008b), and changing composition of the balance sheet of NFCs towards financial assets replaces fixed investment which is so called *crowding-out* effect of financialization both in the U.S. and E.U. economies respectively (Orhangazi 2008a; Tori and Onaran 2018).

Following the survey done by Davis (2017b), I divide the financialization literature into three parts. The first part consists of the studies that focus on the asset side of the balance sheet. The second part consists of the studies that focus on the liability side of the balance sheet, and finally, the studies that focus on shareholder revolution. Reviewing thoroughly for all parts mentioned above, of course, is not the scope of this study. However, the main ideas and works that cover the parts above will be summarized.

The first part of the financialization literature that focuses on the asset side of the NFCs' balance sheet mostly analyses interest and dividend income, financial assets and profits and portfolio income. These studies, in general, cover advanced economies such as the U.S. and the U.K. and investigate the term starting with the early 1950s. In addition to these, both aggregate and firm-level analyses have been used and have been a common approach of these first part of studies. An increase in the financial incomes of NFCs is commonly emphasized in this set of studies by Stockhammer (2004), Krippner (2005, 2011), Orhangazi (2008a; 2008b) and Davis (2017a).

The second part of the financialization literature that focuses on the liability side of NFCs' balance sheet generally investigates interest and dividend payments, stock buybacks and indebtedness. These studies mostly cover advanced economies, U.S. and U.K., and examine the term starting with the mid-1950s. Moreover, aggregate and firm-level data have been used in these second part of the studies. Growth in financial payments (i.e. interest payments, dividends and stock buybacks) from NFCs to financial companies is a

common feature of this term stressed by Orhangazi (2008a), van Treeck (2008), Davis (2016; 2017a), Tori and Onaran (2018).

Number of scholars emphasize the relationship between debt or borrowing and investment (Orhangazi 2008a; 2008b; Mason 2013; 2015; Davis 2016). One of the prominent characteristics of financialization is seen as dramatic rises in indebtedness of NFCs (Palley 2007). Beginning of the post-1970 in the U.S. economy, increases in debt level has been highlighted by Palley (2007), Orhangazi (2008b), Gowan (2009) and Kliman and Williams (2014) at the aggregate level and Davis (2016; 2017b) at the firm-level. The developments above point out the growing significance of financialization processes and also contain fragilities in itself. More debt implies more vulnerabilities and may have negative effect on investment (Orhangazi 2008a; 2008b), and financialization slows down the capital accumulation processes (Stockhammer 2004). Orhangazi (2008b) notes that "The relation between investment and debt should depend on the level of debt perceived as safe by the firm's management and by financial markets. If the level of debt is perceived to be above the safe level, then increases in total debt would have a negative effect on investment" (96).

Orhangazi (2008a; 2008b) also points out that the debt may play an important role in protecting firms from hostile takeover movements and forces managers to be efficient by reducing internal funds or increasing cash commitments under managers' control thus minimize the principal-agent problem in line with Jensen (1986). However, Jensen (1986) also highlights that high debt also poses a threat to the autonomy of the firm management by reducing the ability to meet cash commitments and losing control over the firm, and thus firm possibly goes bankrupt.

Mason (2013; 2015) and Davis (2016; 2017a; 2018) also stress that by showing correlations between borrowing and investment and borrowing and financial payouts, they show a positive but weakening link between borrowing and investment and a strengthening link between borrowing and financial payouts after the 1980s. Mason (2013) explains the above relationship showing pre- and post- 1980s correlations and notes that "firm that was borrowing heavily also tended to be investing a lot, and vice versa; but after 1985, that was much less true… Only those firms with exceptionally high

investment demand borrowed heavily; this explains the strong correlation between borrowing and investment. But since the shareholder revolution of the 1980s, this no longer really holds". According to Mason (2013), the main reason behind this shift is the shareholder revolution movement.

Third part of the financialization literature that focuses on shareholder revolution (Lazonick and O'Sullivan 2000), owner-manager conflict (Crotty 1990) and examining NFCs' financial incomes (Stockhammer 2004; Orhangazi 2008a), financial payments (i.e. interest income and payments, dividend payments, shareholder payouts meaning that dividend payments plus stock buybacks) (Orhangazi 2008a; van Treeck 2008; Dumenil and Levy 2011; Davis 2017a). These studies examine advanced economies, especially the U.S. economy, and cover the term starting with the early 1970s. Both aggregate and firm-level analyses have been used in these studies.

Starting with 1980s, shareholder value maximization was the principal rhetoric of corporate governance. The late 1990s was witnessed a growing debate on shareholder value maximization in the U.S., U.K. and European economies. Organization for Economic Cooperation and Development (OECD) has issued a number of documents that have emphasized that shareholders' management in corporate control is efficient, and shareholders' interest should come first place (OECD 1998; 1999). That is to say, according to OECD, under shareholder influence on management control, the financial markets have become increasingly more effective. In the 1960s and 1970s, Lazonick and O'Sullivan (2000) point out that the growing complexity of markets and competition have changed the behavior of companies from *retain and reinvest* to *downsize and distribute.*

During the 1970s, the U.S. economy witnessed significant deregulation. Before that, during the regulation era, the shareholder influence on management behavior was restricted. The growing significance of financial liberalization or deregulation on the economy allowed the new financial instruments and increased the shareholder ability on management control (Crotty 2003; Stockhammer 2005). As shown in the previous part of this study, these ideas might also be found in Jensen and Meckling (1976) and Jensen (1986). They show in the agency theory that the interest conflict between managers and shareholders would result in inefficiency, since management would engage in

unnecessary activities to be better off his compensations which would be worse off for shareholders of the company. Therefore, they conclude that orderly monitoring management by the shareholder and the role of issuing debt would improve the efficiency, and the measure of performance of the company is the rate of return on their market value of corporate equity (Jensen and Meckling 1976; Jensen 1986).

To sum up, NFCs' debt level hits record level even before the pandemic shock. I present fundamental arguments on changing composition of NFCs' assets, liability side of the balance sheet and point out the importance of shareholder revolution and owner-manager conflict. On the one hand, pre-1980s period, there was a positive and strong link between borrowing and investment. However, after the 1980s, the positive and strong link between borrowing and investment was replaced with the borrowing and shareholder payout stemming from increasing shareholder movement addressed by Mason (2013; 2015). Davis (2017b) also notes that "why firms borrow simply in order to hold more financial assets" (1345). Moreover, Fiebiger (2016) addresses another significant point in order to understand the borrowing behavior of firms and notes that "financing for stock repurchases has been mainly from borrowing rather than profits" (355). The possible consequences of debt might be summarized as follows. Increasing debt reduces the availability of sources to meet cash commitments and thus creates vulnerabilities and negatively affects the fixed investments (Orhangazi 2008a; 2008b), slows down capital accumulation (Stockhammer 2004) and thus endogenously generates investment instability (Crotty 1990).

2.4 RECENT CORPORATE DEBT STUDIES

Even before the Covid-19 pandemic, increasing corporate debt and rising leverage have attracted attention, as mentioned in Chapter 1. As Nikiforos (2020) states the Covid-19 pandemic had a direct impact of both supply and demand side of economy. He notes that "As a large share of production has stopped or will stop, output will decrease from the supply side" (1). On the other hand, restrictions on traveling and uncertainty triggered by the pandemic have decreased the main components of aggregate demand as well (Nikiforos 2020). Brunnermeier and Krishnamurthy (2020) also emphasize the

uniqueness of the Covid-19 outbreak and note that "the corporate sector is at the frontlines of this crisis" (663).

Afanasyeva et al. (2020) examine the link between macroeconomic performance (i.e., output gap, unemployment gap and growth rate) and financial imbalances for the U.S. economy over the last sixty years. They find a strong link between strong economic performance and increases in non-financial sector leverage. In addition to this, an important factor for non-financial sector leverage is driven by business cycle shocks. Their study notes that "running the economy too hot can indeed be a harbinger of financial imbalances" (23). By using National Financial Conditions Index (NFCI) and its sub-indexes, he finds strong and robust evidence that explains the relationship between strong economic performance and increasing nonfinancial leverage. The Chicago Fed's NFCI provides detailed information on the U.S. financial conditions, debt and equity markets. The index presents a weighted average of 105 financial indicators measuring financial activity. The main sub-indexes consist of risk, credit, leverage and nonfinancial leverage explained in Brave and Butters (2012).

The risk sub-index covers the volatility, market fear, interest rate spreads and funding risk. The credit sub-index captures the credit condition and delinquency rates. The leverage sub-index consists of debt and equity measures for finance, insurance and real estate sectors. The nonfinancial leverage focuses on household debt and nonfinancial business debt. Moreover, nonfinancial leverage is a relatively new sub-index among them and tries to detect early signals for financial instability, according to the Chicago Fed.[6] The interpretation of NFCI is based on contributions of sub-indexes to overall NFCI. That is to say, market fear or interest rate spreads and credit risk measures tend to receive positive values in the NFCI, whereas leverage is negatively correlated with the level of the index.

A number of studies focus on zombie firms, which are defined as firms that are not profitable but still remaining in the market instead of exiting through bankruptcy or takeover, has been made by scholars as follows. The term was first used by Caballero et

[6] Brave and Butters, Chicago Fed Letter, No. 305, December 2012 (https://www.chicagofed.org/publications/chicago-fed-letter/2012/december-305)

al. (2008) to analyze Japan economy. McGowan et al. (2018) and Banerjee and Hofmann (2018; 2020) show the significant increase in the number of the zombie firms across the advanced economies and find that the zombie firms are less productive and harm more productive firms by depressing market prices, raising wages, distorting competition and congesting the market in general. All in all, they conclude that these zombie firms reduce *economic dynamism and performance*. Banerjee and Hofmann (2020) make policy advice for the central bank and government. They suggest that one of the important criteria to obtain central bank and government support ought to be viability and profitability of the firm while at the same protecting already weak and unproductive firms. Dinlersöz et al. (2019) conduct a study of the leverage of U.S. firms over their life cycles. The firm leverage, growth and aggregate shocks are investigated in connection with the firm's life cycles. They find that firm size and age are the relevant indicator of leverage for only private firms. Aggregate fluctuations are also found related to the leverage dynamics of firms.

The zombie firm definition is similar to the one ponzi firm definition of Minsky (1992). I presented the Minskian classification in Chapter 2. Based on this concept he introduced, Mulligan (2013) find strong evidence on the North American stock market development from 2002 to 2009 as described in Minsky's financial instability hypothesis, Pedrosa (2019) and Davis et al. (2019) analyze the U.S. NFCs and find consistent evidence on the NFCs that the ponzi firms is concentrated among the small firms. Filho et al. (2018) adopt Minsky's theory on financial fragility and analyze the electricity distribution firms in Brazil and find an increase in financial fragility especially between 2008 and 2013. Nishi (2019) analyzed the Japanese firms by using Minsky's concept with particular attention on differences between sectors and size. He shows that while speculative finance is dominant in many sectors and size, evolution of hedge and ponzi finance differs by category in Japan.

As a result of this literature review, I build on this literature review with a number of conjectures and hypotheses that are reviewed in Chapter 2. The role of borrowing in this literature is different across approaches. In capital structure theories, the broad understanding of borrowing is to maximize firms' market value (Modigliani and Miller 1958). The possible consequences of increasing indebtedness are financial distress cost

or bankruptcy (Frank and Goyal 2008), defaulting risk (Harris and Raviv 1991) and underinvestment problem (Stulz 1990). In the post-Keynesian theories, the primary objective of firm is power or survival under fundamental uncertainty (Lavoie 2015). The motivation of borrowing is linked to fixed investment spending for the pre-1980s. The link between them has vanished for the post-1980s (Mason 2015). New borrowings are associated with financial asset accumulation (Davis 2017b), stock buybacks and dividends (Mason 2015; Fiebiger 2016; Davis 2017b). The debt also leads to macroeconomic fluctuations in investment by reducing internal funds (Fazzari, Hubbard, et al. 1988b), vanishes managerial autonomy and thus long-term firm objectives (Crotty 1990), deteriorates firms' balance sheets and thus creates vulnerabilities both endogenously and exogenously (Palley 1996), increases debt-related payments, fragility and instability (Minsky 1975; 2008), negatively effects on fixed investment (Orhangazi 2008a; 2008b).

All in all, I analyze which firms do borrow, what is the determinants of leverage and what is the possible consequences of debt.

3. AGGREGATE OUTLOOK

The purpose of this chapter is to present the recent aggregate outlook of the U.S. NFCs focusing on increasing indebtedness. As summarized in Chapter 1, NFCs face an unprecedented amount of debt even before the Covid-19 outbreak and pose a risk to the economy stemming from excessive borrowing. The Fed (2020b) notes that "excessive borrowing by businesses leaves them vulnerable to distress if their incomes decline or the assets they own fall in value. In the event of such shocks, businesses with high debt burdens may need to cut back spending sharply, affecting the overall level of economic activity" (4). The U.S. economy had its longest expansion period from June 2009 to February 2020.[7] As Minsky (1972) argues the expansion periods generate financial developments that lead to increase fragility.

Persistent and low-interest rates have already been mentioned for creating potential vulnerabilities even before the pandemic shock (Yellen 2017). The pandemic shock has reawakened a topic that stresses the vulnerability stemming from the high levels of NFC debt. More recently, although the Fed (2020a) highlights that "Historically low-interest rates likely lessened investor concerns about default risk arising from higher leverage…" (36), the Fed also points out that "As the economic effects of COVID-19 continue to unfold, earnings declines will imply significantly lower interest coverage ratios, which could trigger a sizeable increase in firm defaults" (36).

The financial stability reports issued by the Fed (2019a; 2019b; 2020a; 2020b) frequently emphasize that the debt owed by the NFCs reached historically high levels relative to the GDP. In addition to this, recently, a rapid increase in debt is mostly concentrated among riskiest firms such as the firms with higher leverage ratios, higher interest expense and lower cash holdings. According to Fed (2020a), at the beginning of 2020, nearly half of the investment-grade outstanding debt is scored at the lowest investment category grade, which is triple B-, an all-time high. Moreover, downgrading from investment-grade category to speculative category was accelerated since February 2020. An about $125 billion NFCs' debt has been downgraded to the speculative category during this period.

[7] NBER, Business Cycle Dating (https://www.nber.org/research/business-cycle-dating)

Widespread downgrading of bonds could possibly boost investors to sell their bonds and emerge liquidity problem.

The importance of excessive borrowing by NFCs and its effects on economic activity and liquidity are emphasized above. Therefore, what is happening in NFCs at the aggregate level will be shown below. This chapter is split into four parts. The first part shows the total indebtedness of the U.S. economy beginning at the sectoral level. By the end of 2019, indebtedness of NFCs reached historically high levels relative to GDP. In addition to indebtedness of NFCs, different measurements on NFCs' leverage and their ability to meet interest obligations (ICR) are also presented in this part. There has been a sharp decrease in the interest coverage ratio in the 1970s. Beginning of the 2000s, the ratio has slightly recovered but never reached pre-1980 period levels.

The second part provides the profitability and investment of NFCs. While the profitability of NFCs has slightly recovered since the mid-1980s, the average real capital accumulation of NFCs has been lower than pre-1980s during the same period. Concurrently, there has been a decrease in the share of capital expenditures in cash flow beginning from the early 1980s. Even so, NFCs' real capital accumulation decreases or stagnates, despite increases in its profits. However, increases in profits could possibly not fully explain the investment-profit puzzle of NFCs. The earlier studies emphasize similar trends. Earlier booms in NFCs debt could be coincided with investment booms as stressed by Mason (2015). However, Orhangazi (2019) recently shows that despite increases in NFCs debt, real capital accumulation remained stagnant. In addition to above, I look at NFCs sources and uses of funds, the recent link between borrowing and stock buybacks and issuers and holders of NFCs' debt are presented in this part as well.

The sources and uses of funds of NFCs show that despite decreases in labor cost, taxes and net financial payments compared to the pre-1980s period, NFCs net investment remains stagnant or decreases after the 1980s. Meanwhile, profitability has slightly recovered, and shareholder payouts have been almost doubled after the 1980s. The composition of bond and equity holdings of NFCs have changed after the 1980s. In the pre-1980s, the insurance firms and pension funds are the major domestic lenders of NFCs, about 75% of total bonds held by those. However, by the end of 2019, its ratio is 37%.

There has been a sharp increase in the share of mutual funds and foreigners after the 1980s in terms of bond holdings. In 2019, more than half of the total outstanding bonds are held by mutual funds and foreigners.

The third part of the chapter is devoted to the relationship between macroeconomic indicators and financial imbalances. This relationship is already emphasized by post-Keynesian theories, but this is a relatively new research subject outside of the PK theories. The data is provided by Chicago Fed Non-Financial Leverage Sub Index (NFCI). Afanasyeva (2020) shows that there is a link between strong economic growth and financial turmoil. By using National Financial Conditions Index (NFCI) and its sub-indexes, he finds strong and robust evidence that explains the relationship between strong economic performance and increasing nonfinancial leverage. All in all, the importance of increasing indebtedness of NFCs at the aggregate level is summarized. The last chapter is the summary of the chapter. I collect all information presented in this chapter and give a brief summary. In the following parts, I will extend, interpret and illustrate the aggregate data in line with the above introduction for NFCs.

3.1 INDEBTEDNESS

There is no consensus on how to measure leverage, as stressed in Chapter 2. Five different measures are widely used to assess NFCs' leverage at the aggregate level. The first is the most frequently used approach, which is debt to GDP ratio as presented above. Debt to GDP ratio compares to stock variable of debt with flow of income. The second is the stock-to-stock approach, which is debt to asset ratio that is widely used in corporate finance. Another stock-to-stock approach is liabilities over total asset ratio. The fourth one is flow-to-flow approach, earnings over interest payments, called interest coverage ratio (Bräuning and Wang 2020). The last one is debt over debt plus market value of outstanding equities approach which is also widely used in corporate finance (Frank and Goyal 2008).

In this part, I display indebtedness, leverage and debt-related ratios of NFCs. I use a number of macroeconomic indicators, as a shaded areas, such as output gap and

unemployment gap provided by St. Louis Fed (FRED Economic Data). The output gap is defined as real GDP minus real potential GDP over real potential GDP. The unemployment gap is defined as unemployment rate minus natural rate of unemployment. Before the GFC, the U.S. total debt was about $33 trillion and 364% of the GDP in 2007. After the GFC, the U.S. total debt has declined as a share of the GDP. This decline has been mostly initiated by household and financial sector deleveraging. Although household consumer debt relatively stable, household mortgage debt has dramatically declined. Starting from 1987, the financial sector debt to GDP ratio has almost tripled within 20 years, the highest increase compared to others, and carried the biggest debt to GDP ratio until the eve of the GFC, 118% of the GDP as an average of the 2008 and 2009. In 2019, the U.S. total debt was about $54 trillion and 352% of the GDP. The same downward trends are valid for both household and financial sector debt ratios, 75% and 78% respectively. These two major declining components of the U.S. total debt possibly mask corporate re-leveraging, according to Table 3.1.

Table 3.1: The U.S. Sectoral Debt Composition as a share of the GDP

	1980-1999	**2000-2007**	**2008-2009**	**2010-2013**	**2014-2018**	**2019**
Household	59%	86%	96%	86%	78%	75%
Financial Sector	45%	101%	118%	95%	83%	78%
Government	59%	58%	77%	97%	101%	103%
Non-Financial Business	58%	64%	71%	67%	72%	75%
Non-Financial Corporate	39%	43%	44%	41%	45%	47%
Total	228%	319%	375%	361%	352%	352%

Source: Financial Accounts of the United States.

Table 3.1 presents the U.S. sectoral debt as a share of the GDP. The columns show the average total sectoral debt as a share of the GDP over the periods. Over periods, all sectors have increased leverage from 1980 to 2007. After reaching historically high levels in the average of 2008-2009, the following couple of years have witnessed deleveraging for all sectors, excluding the government sector. While financial and household leverage have declined, government sector rapidly but non-financial business leverage has slowly but surely increased starting from 2011. The U.S. government has been the largest issuer of debt since 2012.

The non-financial business consists of both non-financial non-corporate and non-financial corporate firms. The leverage of NFCs has displayed similar trends like total non-financial business. In 2010s, NFCs have piled up about $4 trillion debt and reached $10 trillion total debt at the end of 2019. Even before the pandemic shock, debt to GDP ratio of NFCs has reached historically high levels, 47% of the GDP. Recent quarterly data from the FRED, 2020 Q2, show that the NFCs total debt is almost $11 trillion and 56% of the GDP. This newest peak level is mainly due to the COVID-19 pandemic, causing both a rapid increase in NFCs total debt and a sharp decline in the GDP. Although there is a signal for the GDP to recover the following quarter, unprecedented debt accumulation is experienced for the NFCs during this period. According to the Financial Account of the U.S., NFCs accumulated about $800 billion debt within the first six months of 2020, which is never seen before.

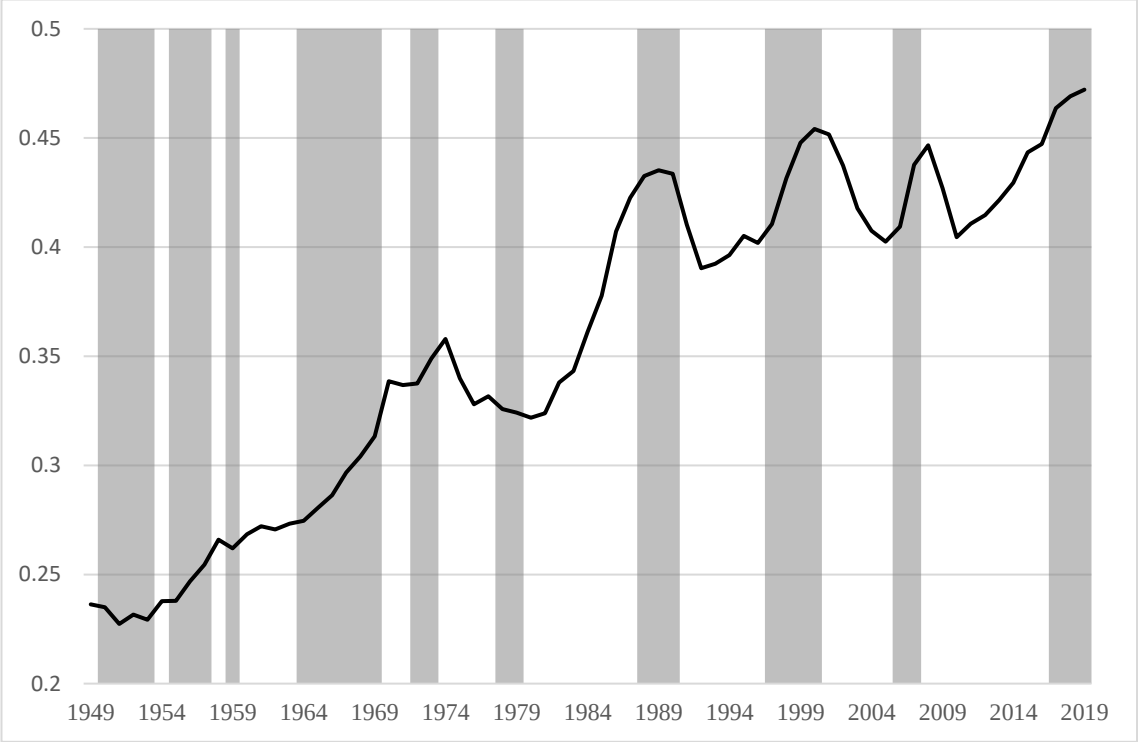

Figure 3.1: NFCs' Debt as a Share of the GDP

Notes: The shaded areas denote years of positive output and/or negative unemployment gaps and the data come from FRED.
Total Debt / GDP: LA104104005 / FA086902005
Source: FRED, Financial Accounts of the United States (Table D.3, F.2).

Figure 3.1 displays the debt to GDP ratio for the NFCs over the years. The debt depicts the sum of debt securities and loan liabilities for the NFCs. The leverage of NFCs has regularly increased until the 1974 crisis. After a couple of years of deleveraging, the leverage of NFCs has begun to increase and interrupted again in 1989. A similar trend could be seen in the term between 1992 and 2000 and between 2005 and 2008. Every expansionary term has been likely interrupted by the crisis. The last expansionary cycle started in 2010 in terms of debt. This is the longest and ongoing debt expansionary period, which is not interrupted for nine years since the 1980s.

Figure 3.2 presents the three leverage measurements for the NFCs. Which measures used is beneficiary in order to understand aggregate leverage levels of NFCs.

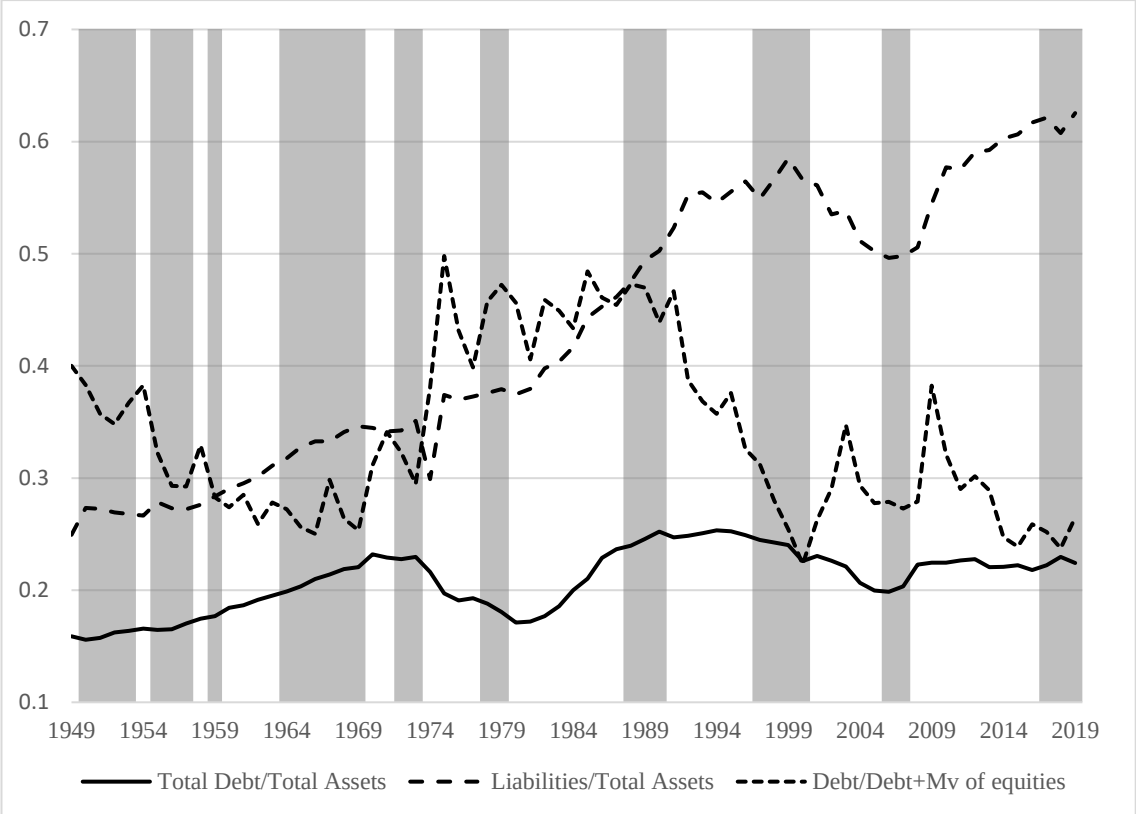

Figure 3.2: NFCs' Leverage Ratios

Notes: The shaded areas denote years of positive output and/or negative unemployment gaps and the data come from FRED.
Total Debt / Total Assets: LA104104005 / FL102000005
Liabilities / Total Assets: FL104190005 / FL102000005
Debt / Debt+Mv of Equities: LA104104005 / (LA104104005 + LM103164103)
Source: FRED, Financial Accounts of the United States (Table D.3, B.103).

The debt to GDP ratio and liabilities to total asset ratio show that the NFCs have leveraged over time and reached an all-time high in 2019. This means that the role of "net worth" of NFCs decreases over the periods as a fraction of the total liabilities. Total debt to total assets ratio displays that the aggregate leverage is stationary over the periods, as stressed in Frank and Goyal (2008). However, debt over debt plus market value of outstanding equities ratio shows that the leverage of NFCs decreases since the 1990s. Decreases in this ratio beginning in the 1990s might be coincided with stock market boom or increases in market values of equities by repurchasing own shares through borrowing. As discussed in Chapter 2, different measurement shows us different trends for the NFCs leverage. Using debt to GDP and or debt to asset ratios as a leverage may show more clear trends in this manner.

Figure 3.3 shows the NFCs ability to meet interest obligations. This ratio is also known as the ICR. The ratio is defined as operating surplus over interest payments. The interpretation of the ratio is as follows. ICR means that the higher the ratio is, the more firms are able to cover interest payments by using their income. If the ratio is below zero, firms must borrow or sell their assets to meet interest repayments. Throughout the term between 1949 to 1969, ICR has sharply declined from about 13 times to 3 times. The term between the 1970s to 2000s, ICR has continued to worsen and reached historically low levels in 2001. After then, ICR has barely recovered. Despite improvement of ICR after the GFC, the ratio has never reached the pre-1980 period averages. What lies under this recovering is likely the lowered interest rates and increases in earnings. Almost zero level interest rate policy possibly helps improve the ICR.

All in all, in this part, I present the liability side of the balance sheet of the NFCs. NFCs face an unprecedented level of debt and pose a risk to financial and economic stability, as stressed in Chapter 2. Former Fed Chair and now Treasury Secretary Yellen highlighted that the potential risks that the economy might face. The Former Fed Chair Yellen noted that as follows:

> I think that allowing the economy to run markedly and persistently "hot" would be risky and unwise… The combination of persistently low interest rates and strong labor market conditions could lead to undesirable increases in leverage and other financial imbalances, although such risks would likely take time to emerge. Finally, waiting too long to tighten

policy could require the FOMC to eventually raise interest rates rapidly, which could risk disrupting financial markets and pushing the economy into recession. (2017)

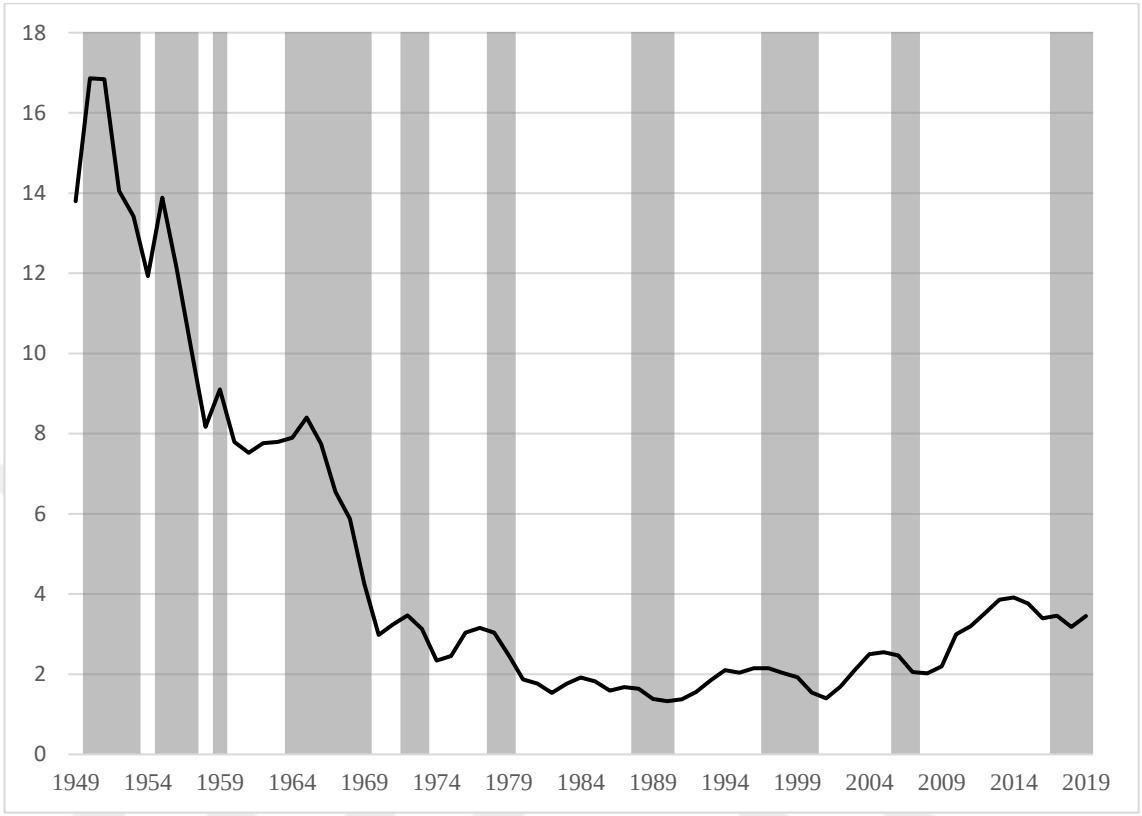

Figure 3.3: NFCs' Interest Coverage Ratio

Notes: The shaded areas denote years of positive output and/or negative unemployment gaps and the data come from FRED.
Operating Surplus / Interest paid: FA106402101 / FA106130001
Source: FRED, Financial Accounts of the United States (Table S.5).

The following part of this chapter mostly focuses on the cash flow statements of the NFCs. How NFCs use cash flows coming from debt as well as their profits will be analyzed in the next part at the aggregate level.

3.2 PROFITABILITY AND INVESTMENT OF NFCs

Minsky (1972) argues that the structural characteristic of the system such as periods of expension and economic boom era pose the stability of the system. Confidence in the economy and after an expansionary era for some time could trigger the economic downturns endogenously. During buoyant times, as risk perception decreases, future expectations of the investors become optimistic, and financial constraints are unwound.

The idea known as *this time is different* becomes popular wisdom during this period. Armed with these information, I first look for selected ratios in help with macroeconomic indicators for the NFCs over the period. By using shaded areas, positive output gap and negative unemployment gap, profitability of the NFCs is illustrated in Figure 4. Profitability is defined as profits before tax excluding inventory valuation adjustment (IVA) and capital consumption adjustment (CCAdj) over nonfinancial assets minus inventories.

Figure 3.4, in help with shaded areas, explicitly shows the relationship between macroeconomic indicators and profitability of NFCs. Almost all profitability declines fall into shaded areas, implying the link between them. However, of course, there are other factors that contribute to decrease profitability as well. Nevertheless, one could possibly say that there is a relationship between macroeconomic indicators and profitability in this manner.

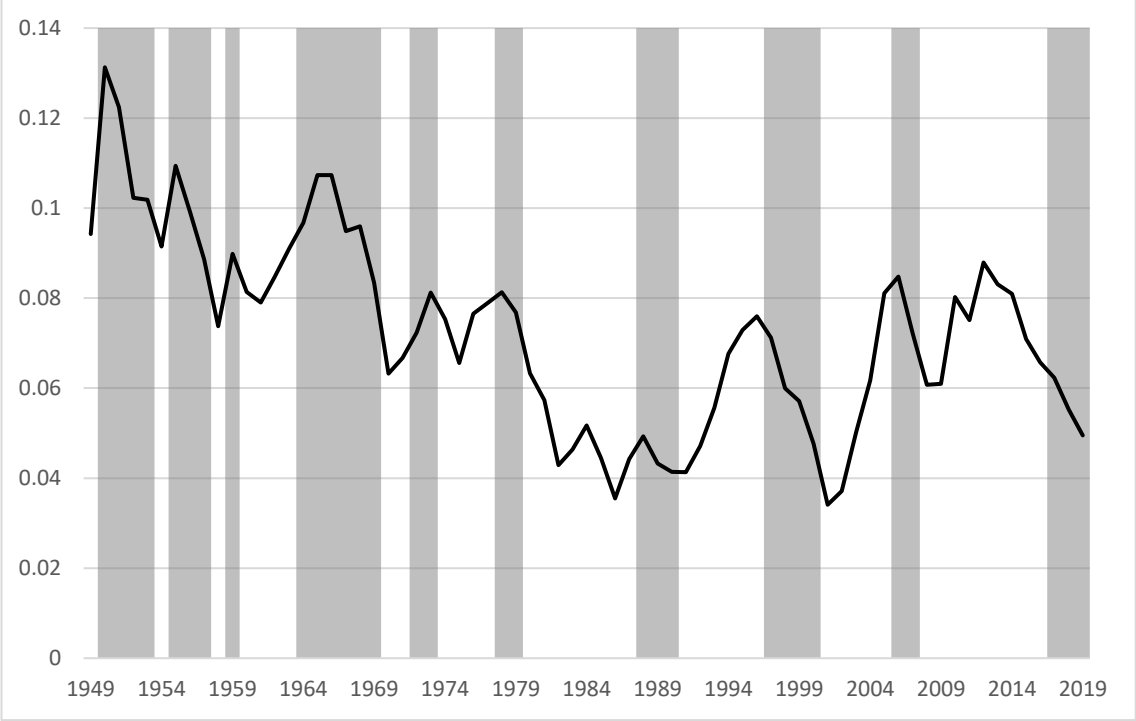

Figure 3.4: Profitability of the NFCs

Notes: The shaded areas denote years of positive output and/or negative unemployment gaps and the data come from FRED.
Profitability: FA106060005/(LM102010005-LM105020015)
Source: FRED, Financial Accounts of the United States (Table F.103, B.103).

The profitability of NFCs tends to decrease until mid of the 1980s. However, starting from the mid of 1980s, profitability of NFCs tends to recover following years but never reaches 1950s' and 1960s' peak levels. NFCs hit record low levels in profitability in 2001. Following 2001, there has been a recovery in profitability of NFCs until the GFC. Despite increases in profitability following years after the GFC, profitability of NFCs has tended to decline since 2013.

Figure 3.5 displays the rate of capital accumulation for NFCs defined as NFCs' net investments divided by the NFCs' nonfinancial assets minus inventories for the period between 1949 and 2018. Net investment is calculated as gross fixed investment minus depreciation. Throughout the years between 1949 to 1980, the rate of capital accumulation fluctuated in a corridor between %2 and 4%. A sharp collapse in the rate of capital accumulation begins in the early 1980s and continues to the end of the 1980s. A rapid increase starting from the early 1990s is interrupted by the dot-com crisis beginning of the 2000s. After an expansionary period starting from 2002 to 2007, the rate of capital accumulation hits a record high level but never reaches pre-1980 levels. Following the period after GFC, the rate of capital accumulation barely recovers and almost reaches pre-crisis levels and then collapses again after 2014.

On average, I observe that the rate of capital accumulation for the post-1980 period is below the pre-1980 period. In addition to the average rate of capital accumulation, the fluctuations of the rate of capital accumulation are also more severe than in the pre-1980 period. As seen in figure 3.4, figure 3.5 also exhibits a similar relationship between macroeconomic indicators and the rate of accumulation as well. Even so, almost all declines in the rate of capital accumulation fall into shaded areas.

It is seen that when analyzing figure 3.4 and figure 3.5 together, although the rate of capital accumulation of NFCs slows down for the post-1980 period, the profit rate of NFCs recovers for the same period. Similar arguments made by Stanford (2017), he points out that the level of investment has been lower in the post-1980 period compared to the period between 1945-1975. The puzzle, investment-profit, behind these narratives is explained mostly in early financialization literature (Crotty 2003; Stockhammer 2004; Orhangazi 2008a). Moreover, Orhangazi (2019), in his recent work, adds another layer to

explain the investment-profit puzzle. He suggests that the role of intangible assets allows firms to have higher profitability ratios without increasing a correspondent level of investment. Stanford (2017) emphasizes that the contradiction between high profitability and low investment creates a potential aggregate demand problem.

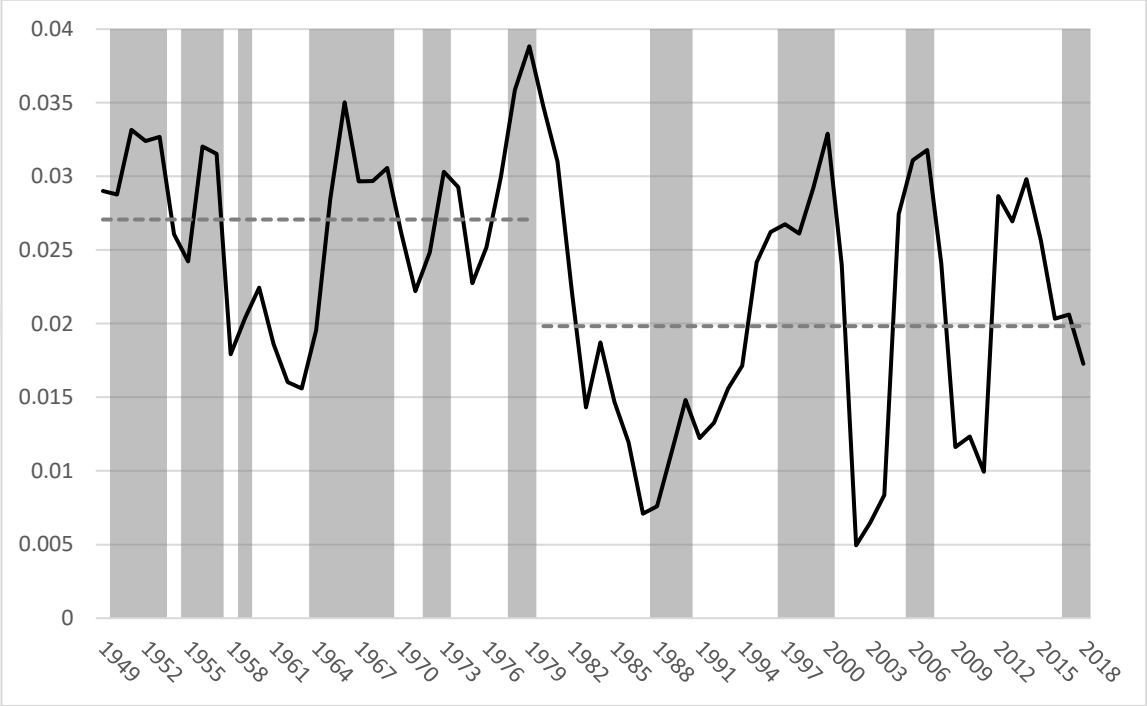

Figure 3.5: Rate of Capital Accumulation of the NFCs

Notes: The shaded areas denote years of positive output and/or negative unemployment gaps and the data come from FRED. The dotted lines denote the average rate of capital accumulation for the pre-1980 and post-1980 periods.
Capital Accumulation: (FA105019005-FA106300015)/(LM102010005-LM105020015)
Source: FRED, Financial Accounts of the United States (Table F.103, B.103).

In the period between 1945 and 1980, profitability and investment had a strong correlation. However, the post-1980 period shows that this relationship has weakened (Mason 2015). As Orhangazi (2019) notes that "starting around the early 2000s, and especially after the 2008 crisis, the rate of capital accumulation for US nonfinancial corporations has slowed down despite relatively high profitability; indicating a weakening of the link between profitability and investment" (1251). In addition to this, by following Fazzari et al. (1988b) and Krippner (2005), they suggest that using cash flow to test the investment-profit relationship might be a good indicator if firms cannot access or raise external funds. Hence, figure 3.6 shows the NFCs' capital expenditure as a share

of its cash flow. The capital expenditure is defined as the gross fixed investment, and cash flow is defined as profits before tax minus taxes on corporate income plus depreciation (capital consumption allowance) plus IVA.

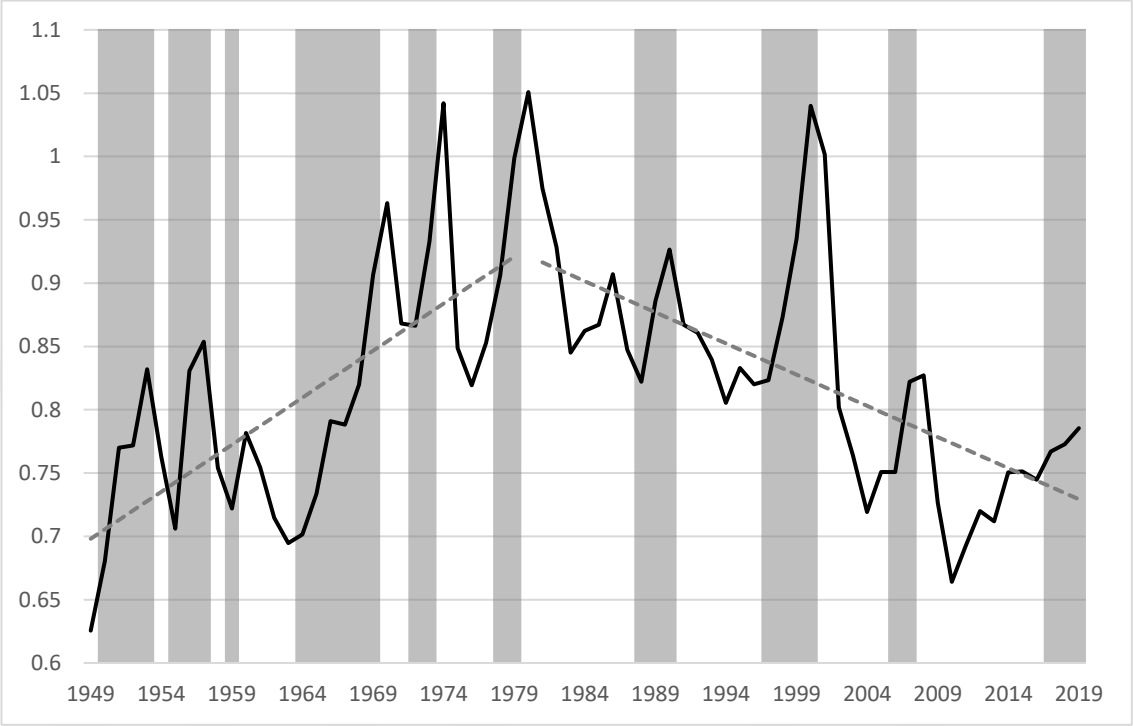

Figure 3.6: NFCs' Capital Expenditures as a Share of its Cash Flow

Notes: The shaded areas denote years of positive output and/or negative unemployment gaps and come from FRED. The dotted lines denote the trend lines of NFCs' capital expenditures as a share of its cash flow for the pre-1980 and post-1980 periods.
Capital Expenditure: FA105019005
Cash Flow: (FA106060005-FA106231005+FA105020601+FA106300015)
Source: FRED, Financial Accounts of the United States (Table F.103).

Figure 3.6 clearly shows that although the capital expenditures to cash flow ratio fluctuated, the trend of share of capital expenditures in cash flow of firms steadily increase during the period between 1949 and 1980. After reaching to record 105% of cash flow in 1980, the trend line of capital expenditures to cash flow secularly declines. Sharp increases in 2000 and 2008 are due to profit collapse, not to investment increase in these correspondent years. Throughout 1980, the relationship between profitability and investment is seen as positive, which is consistent with the pecking order theory, financing constraints argument and post-Keynesian theories as well. However, according to aggregate data, the relationship between internal funds and investment has weakened,

and the internal funds of the firms are not likely the main driving force for the investment of NFCs for the post-1980 period.

As Mason (2013), by reminding the Modigliani and Miller theorem, noted in his personal blog that "… how much a firm borrows is now largely independent of how much it invests". Table 3.2 presents the simple sources and uses of funds of the NFCs. GVA depicts the difference between sales and cost of inputs for the NFCs. In this respect, the U.S. economy total GVA is equal to the GDP. The NFCs have about half of the total GVA over the available years. Labor costs express the compensation of employees paid, taxes refer to production tax and imports less subsidies and net financial payments is equal to interest paid minus interest received. Hence, by extracting these three items from the GVA, I obtain the internal funds of the NFCs. Payouts are equal to the sum of dividends paid and net stock buybacks. Net investment is equal to gross investment minus depreciation.

Gross investment plus payouts minus internal funds give us the financing gap, and it shows that the NFCs are the net borrower (if positive) from the market excluding the first period. Profits are calculated as a difference between internal funds and depreciation. According to Table 3.2, the main origins behind the increasing share of internal funds stem from decreasing share of taxes until the 2000s. After then, a stable share of taxes and decreasing share of labor cost with a small impact of decreasing net financial payments help provide the improvement of internal funds for the post-2000s. In addition to this, the share of gross investment has experienced secular increases in the term between the 1950s and 1980s. However, the post-1980 period has witnessed a modest increase in the share of gross investment. To sum up, a rapid increase in the share of internal funds along with a relatively stable share of gross investment is not the only reason behind the positive financing gap for NFCs. One can possibly say that the payouts are also the important reason behind the increasing financing gap, according to Table 3.2.

Figure 3.7 shows the relationship between borrowing and stock buybacks for the NFCs over time. The borrowing is defined as year over year net change in NFCs' total debt and stock buybacks are defined as it is. Negative values on the corporate equity changes are interpreted as stock buyback in data.

Table 3.2: NFCs' Sources and Uses of Funds

GVA=100	**1949-1959**	**1960-1979**	**1980-1999**	**2000-2007**	**2008-2009**	**2010-2013**	**2014-2018**	**2019**
Labor Costs	63	63	64	62	60	57	59	60
Taxes	18	15	12	11	11	12	11	11
Net Interest Payments	1	2	4	3	4	3	3	2
=Internal funds (Cash Flow)	**19**	**20**	**21**	**23**	**25**	**28**	**27**	**27**
Dividends	5	5	5	7	8	7	8	6
Net Stock Buybacks	-1	-1	2	3	3	4	5	4
=Payouts	**4**	**4**	**7**	**10**	**10**	**12**	**13**	**10**
Gross Investment	14	16	18	18	19	18	20	20
Depreciation	9	10	13	14	16	15	15	16
=Net Investment	**5**	**6**	**5**	**4**	**3**	**3**	**4**	**4**
Financing Gap	**-1**	**0**	**3**	**5**	**4**	**3**	**6**	**3**
Profits	**10**	**9**	**8**	**9**	**9**	**12**	**11**	**11**

Source: Financial Account of the United States, Mason (The Slack Wire 2013).
Notes: The value of each item is indexed to Gross Value Added (GVA) of NFCs and then averaged over available years presented above.

Both items are represented as a percentage of the NFCs' GVA. As it can be seen on the figure, the stock buybacks fluctuated around zero percent until the 1980s and the relationship between borrowing and stock buybacks is seen as irrelevant or weak for the same period. However, as of the 1980s, it is seen that the borrowing and stock buybacks begin to move together, and the magnitude of this relationship is more precise and stronger than before. As a result, especially after the 1990s, one might possibly say that one of the important reasons borrowing of NFCs is to finance its stock buybacks.

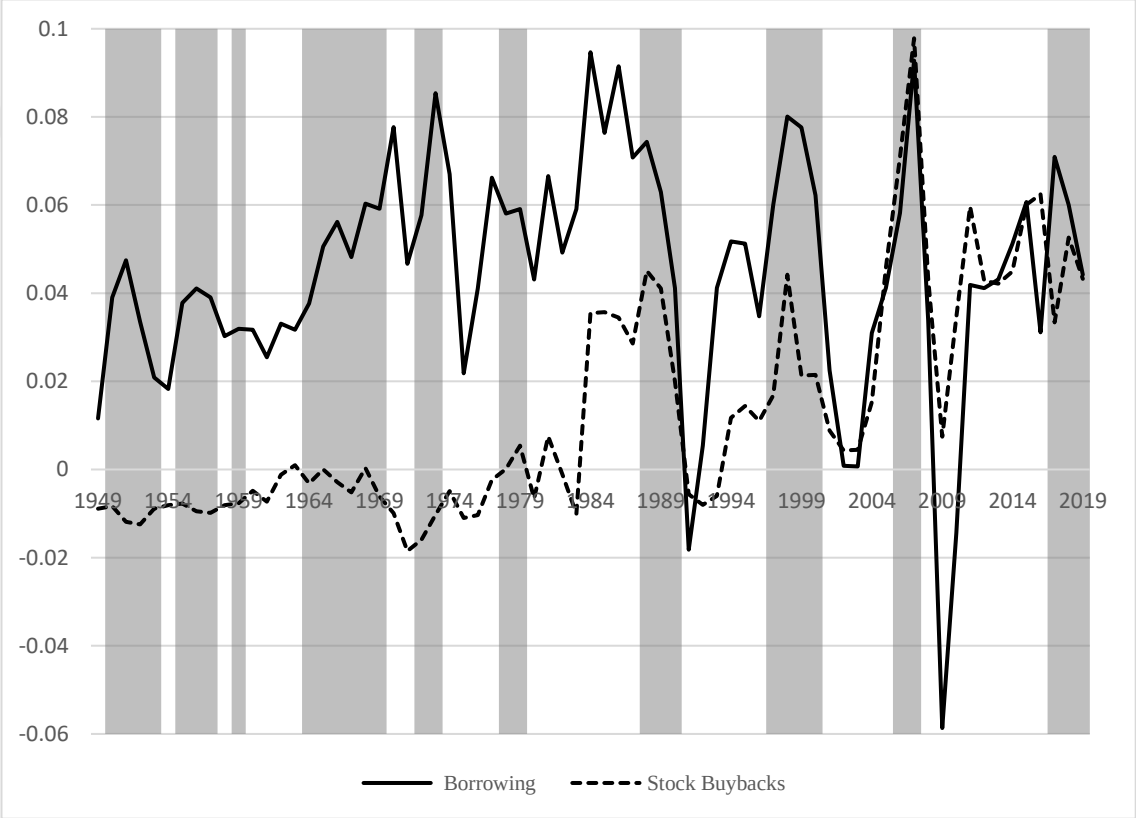

Figure 3.7: NFCs' Borrowing and Stock Buybacks as a share of its GVA

Notes: The shaded areas denote years of positive output and/or negative unemployment gaps and these data come from FRED.
Borrowing to GVA: $(LA104104005_t - LA104104005_{t-1})/FA106902501_t$
Stock Buybacks to GVA: (FA103164103/FA106902501)*(-1)
Source: FRED, Financial Accounts of the United States (Table D.3, S.5).

Stock buybacks are not a new topic for the U.S. economy. Their origins are traced back to the 1982 SEC Rule.[8] Lazonick (2015) emphasizes that there are winners and losers of

[8] For detailed information See: (https://www.sec.gov/divisions/marketreg/r10b18faq0504.htm)

the stock buybacks. He highlighted that stock buybacks manipulate the stock prices and increase inequality. The financial gains resulting from stock buybacks go to the richest top 1%. This top 1% percent mostly consists of the corporate executives. In addition to the top corporate executives, investment bankers and hedge fund managers are the main beneficiaries of the stock buybacks. Ordinary investors, the losers, do not know the timing of stock buybacks but top executives, investment bankers and hedge fund managers do and make a profit from it. Their methods are first to boost stock prices and then to dump it for a significant gain. This kind of investment does not create prosperity for all, and he summarizes these activities as *profits without prosperity* (Lazonick 2015).

NFCs' total debt is sum of outstanding debt securities and loans. The evolution of the total NFCs' debt is addressed below. However, the composition of the NFCs' debt and holders of debt are not delved into for previous chapters. Table 3.3 fills this gap in this respect. Table 3.3 begins to present the combination of the NFCs' debt over the period and then shows the sectoral shares of issuers and holders both for bonds and equities. The majority of the composition of the NFCs' total debt comprises of the debt securities, overwhelmingly corporate bonds, except the term between 1960-1979. It is the sole term that share of loans in total debt exceeds the share of debt securities. The rest of the terms presented below shows that the debt securities are the main source of debt for the NFCs. Until the 2000s, the share of debt securities in total debt has fluctuated around 50%. However, a modest increase in the share of debt securities is observed in the 2000s and interrupted in the GFC.

The years following the GFC have displayed slow but steady increase in the share of debt securities, and about two-third of the total debt consisted of the debt securities in 2019. Increasing share of debt securities does not stem from decreasing share of loans. That is to say, rate of increase for the debt securities is bigger than rate of loans. Total bond issuance shows that the NFCs gradually increase their share of bond issuance in total bond issuance. Preference from loans to bonds financing for NFCs is observable phenomena in the finance literature (Aldasoro and Ehlers 2018). NFCs have been the biggest issuer of bonds until the 1990s. After the 1990s, financial firms' bond issuance has surpassed the NFCs bond issuance and have reached its historically high levels during the GFC.

Table 3.3: The Evolution of NFCs' Debt

	1949-1959	1960-1979	1980-1999	2000-2007	2008-2009	2010-2013	2014-2018	2019
Composition of NFCs' Debt								
Debt Securities	0.54	0.48	0.52	0.58	0.57	0.66	0.68	0.65
Loans	0.46	0.52	0.48	0.42	0.43	0.34	0.32	0.35
Bond Issued By								
Corporate	0.88	0.78	0.58	0.37	0.29	0.33	0.40	0.41
Financial Firms	0.05	0.14	0.31	0.50	0.56	0.47	0.38	0.35
Rest of the World	0.06	0.08	0.11	0.13	0.14	0.20	0.22	0.24
NFC's Bond Held By								
Households	0.11	0.14	0.13	0.11	0.15	0.18	0.10	0.07
Government	0.00	0.00	0.01	0.02	0.02	0.02	0.01	0.01
Banks	0.09	0.06	0.09	0.09	0.10	0.07	0.05	0.05
Insurance Firms	0.61	0.44	0.34	0.26	0.19	0.24	0.24	0.27
Pension Funds etc.	0.15	0.30	0.20	0.08	0.07	0.09	0.10	0.10
Mutual Funds etc.	0.02	0.03	0.06	0.11	0.10	0.16	0.18	0.21
Rest of the World	0.02	0.03	0.16	0.33	0.32	0.29	0.30	0.30
Discrepancy	0.00	0.00	0.00	0.00	-0.04	0.04	-0.01	0.02

Table 3.3: The Evolution of NFCs' Debt (Cont.)

Equity Issued By								
Corporate	0.78	0.86	0.81	0.66	0.64	0.62	0.62	0.62
Financial Firms	0.21	0.13	0.13	0.20	0.18	0.18	0.20	0.21
Rest of the World	0.01	0.01	0.05	0.14	0.18	0.20	0.18	0.17
NFC's Equity Held By								
Households	0.90	0.74	0.48	0.38	0.35	0.35	0.37	0.39
Nonfinancial Corporations	0.00	0.04	0.08	0.06	0.05	0.04	0.04	0.04
Government	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00
Banks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Insurance Firms	0.03	0.04	0.05	0.03	0.03	0.03	0.02	0.02
Pension Funds etc.	0.02	0.10	0.22	0.18	0.16	0.15	0.12	0.11
Mutual Funds etc.	0.03	0.05	0.10	0.25	0.28	0.28	0.28	0.29
Rest of the World	0.02	0.03	0.06	0.10	0.12	0.14	0.15	0.15

Note: Table shows aggregate debt and equity issued and held by different sectors of the economy. Bond issued and held are presented as a fraction of total bonds outstanding. Equity issued and held are presented as a fraction of total equity outstanding. Discrepancy denotes the accumulated valuation difference between issuance and holdings.
Source: Financial Accounts of the United States.

Meanwhile, NFCs' bond issuance has fallen below 30% for the same period, which has been the lowest record over available periods. Following the GFC, financial firms' bond issuance has dramatically declined, whereas NFCs' bond issuance has recovered.

Another point is the holders of these bonds. According to Table 3.3, households, banks, insurance firms and pension funds are the net sellers of the NFCs' bonds, while mutual funds and the non-resident investors are the net buyers of the NFCs' bonds. The dramatic decrease in insurance firms' bond holding is replaced with increases in non-residents and mutual funds. One-third of the total bond is held by non-resident investors in 2019. Equity issuance is the other financing source for companies. Starting from the 1950s, corporate sector equity issuance share, as a percent of total shares, has increased until the end of the 1970s. After that, there has been a sharp decline in the share of corporate equity issuance during the 1980s. This declining share of corporate equity issuance has been stemmed from both increasing share of financial firm equity issuance and foreign issuance.

The last two decades show stable outlook for shares of all equity issuers. These equities are overwhelmingly held by households in the 1950s. However, households that hold these equities have declined below 50% the term between 1980s and 1990s. Throughout this period, households are the net seller of these equities and pension funds, mutual funds and the NFCs are the net buyers of these equities. The first ten years of the 2000s have experienced that the households, still, are the net seller of these equities but together with pension funds different from the previous period. At the same time, mutual funds have almost tripled their shares. A modest increase in the share of equity holdings is seen after the GFC for the households and mutual funds. Recent available data show that households and mutual funds hold the majority of these equities, 39% and 29% respectively. The rest of the equities are held by foreign investors, pension funds, NFCs and insurance firms as a descending sort.

3.3 FINANCIAL IMBALANCE

The works on the link between financial imbalances and macroeconomic performance outside of the post-Keynesian literature are relatively new. As Minsky (1972) argues that

periods of boom era pose the stability of the system. Afanasyeva (2020) finds strong evidence that there is a link between strong economic growth and financial turmoil.

Figure 3.8 displays the nonfinancial leverage sub-index of NFCI. The shaded areas again denote the years of positive output and negative unemployment gaps. Every peak in the nonfinancial leverage index falls into shaded areas. Positive values imply that tighter than average financial conditions, whereas negative values imply that looser than average conditions. Persistent tighter conditions rise risk premium and decrease asset values and thus leads to a period of deleveraging. As a result of deleveraging, economic activities inevitably lower. As stated above, NFCI nonfinancial leverage sub-index might give early signals for financial imbalances. Persistently running the economy too hot might follow the financial disturbances and damages to the healthiness of the economy.

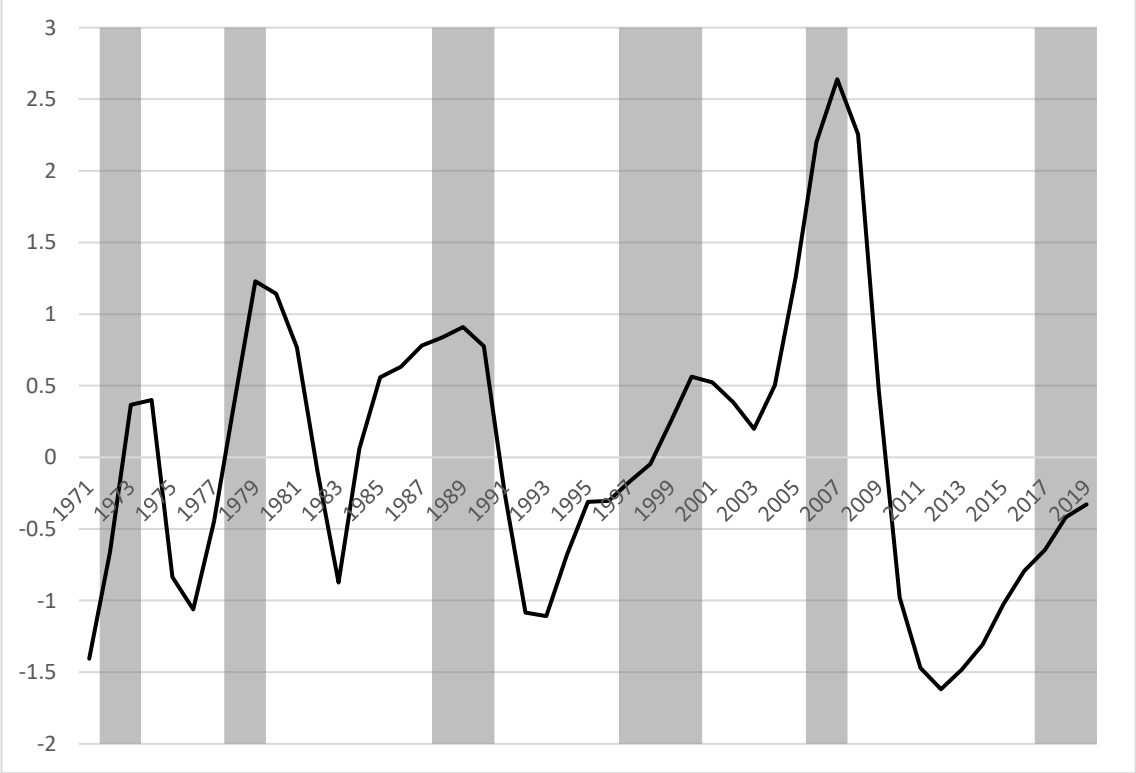

Figure 3.8: The NFCI: Nonfinancial Leverage Sub Index

Notes: The shaded areas denote years of positive output and/or negative unemployment gaps and this data come from FRED.
Source: FRED, NFCI of the Chicago Fed.

Starting with the 2012, nonfinancial leverage sub-index secularly increases and might harbinger of the financial system downturns. Aggregate outlook and the NFCs' debt are

presented in this chapter. Although total debt to GDP decreases in the economy after the GFC, NFCs continue to accumulate debt faster than before. Even before the pandemic shock, NFCs reach historically high levels of leverage and pose a risk for the economy. The next chapter will be devoted to the firm-level analysis of the NFCs.

3.4 SUMMARY OF THE CHAPTER

In this chapter, NFCs are analyzed using selected ratios looking at the aggregate outlook in help with macroeconomic indicators from 1950 to 2019. The first part of the chapter is devoted to the indebtedness of the NFCs. First, I show the U.S. total debt composition as a sectoral level. This sectoral decomposition help provide me whether which sector leverages or deleverages. Second, leverage ratios of NFCs are illustrated by using aggregate data. Third, some debates on measuring leverage are briefly summarized and additional ratios are provided.

In the second part of the chapter, I show the number of items from the cash flow statements of NFCs. In addition to this, by replicating simple cash flow statements provided by Mason (2013), sources and uses of funds are presented over the periods. The weakening link between borrowing and investment is discussed, and the strengthening link between borrowing and payouts is illustrated. From this point of view, origins of borrowing such as loans or debt securities and holders of total NFCs' debt are shown.

Finally, in the third part of the chapter, using NFCI data, the link between macroeconomic performance and financial imbalances is highlighted. The role of macroeconomic performance and the tools behind it are also discussed and the rising concerns on policy choice affecting future turmoil are addressed.

As a result of this chapter, NFCs are more indebted than before. The leverage of NFCs hit the record level at the end of 2019. Although their ability to meet interest obligation recover after the GFC, the ICR of NFCs is still below the pre-1980s average. Besides increases in debt, the profitability of the NFCs has recovered post-1980 period. Despite recovers in profitability and increases in debt, the investment rate of the NFCs has remained stable or decreased during the same period. There has been a limited impact on

the capital accumulation processes. More money comes in firms as a form of earnings and debts, and more money goes out of from firms as a shareholder payout. One might possibly say that the available funds are not channelized to long-term investment opportunities but channelized for short-term activities. All in all, increases in leverage of the NFCs could possibly pose a risk on financial stability and rises vulnerabilities. The following chapter is dedicated to firm-level analysis. In help with the firm-level data, I will present "*who borrowed?"* and "*how was it used?*".

4. DATA AND FIRM LEVEL ANALYSIS

In the previous chapter, I show the profitability, investment and indebtedness of NFCs by emphasizing the concerns on increasing debt-related risk at the aggregate level. However, aggregate data provide a big picture but do not provide a detailed picture. In this respect, firm-level data could fill this gap and provide richer explanations to this study. Firms differ by size, age and across industries. Using firm-level data could help me to consider these differences. Another significant role using firm-level data is to show macro-micro linkages. The importance of this link has been stressed by Pedrosa (2019). This chapter consists of 6 parts. In the first part, I introduce the data used in this study and present list of variables with definitions and original names of these variables as well as the representativeness of the data. In addition to this, I also present the uneven distribution of debt among firms.

In the second part, I display the aggregate ratios using firm-level data. The measurement of variables in this part is different from the other parts in chapter 4. This measurement could possibly allow to compare with aggregate data. Firms, whether display similar trends compared to aggregate data, are shown in this part. In the third part, benefitting from firm-level data, I show the leverage of firms with different factor variables. Leverage ratios of firms are displayed with respect to firm size, firm age, industry, profits and market power both for mean and median values. Even so, who borrowed at the firm level is tried to answer in this part. The fourth part is dedicated to show the uses of funds of firms. After illustrating the increasing leverage of firms in the third chapter, I present investment rate, financial asset accumulation, distribution to shareholders and intangible asset accumulation of firms.

The fifth part is devoted to regression analysis. In this analysis, I present a number of factor variables that potentially determine the leverage of firms with available periods, by firm size and by Fama-French industry classifications. The last part is summary of the chapter. In this part, I gather all findings performed in this chapter and interpret the implication of findings before passing to the next chapter, which is dedicated to the consequences of debt.

4.1 DATA

The data used in this study come from Standard and Poor's Compustat database. Compustat provides annual statistics for publicly held companies about income statement, balance sheet, cash flow statement and supplemental information. The database is an unbalanced panel data and covers from 1950 to 2019. However, some data items such as stock buybacks are not fully reported up to the 1970s. Therefore, I focus on the data starting from 1980. Since I focus on only non-financial firms, I exclude the finance and real estate sectors from the database (Standard Industry Classification (SIC) codes between 6000 and 6799). In addition to this, I exclude the utility sector from the database (SIC codes between 4900 and 4999). Since, the utility sector is regulated and might lead to misinterpretation of their leverage. The firms with negative and missing values of total assets (compustat item number #6), capital expenditures (#128), property plant and equipment (#8), sales (#12) and finally, cost of goods sold (#41) are also excluded. Finally, I keep only the firms that incorporate in the U.S.

The variable definitions are as follows. The leverage ratio is defined as total debt relative to total assets. The total debt is the sum of long-term debt and short-term debt. The profit rate is income before extraordinary item relative to capital stock. The investment rate is defined as capital expenditures to capital stock. The cash holding ratio refers to cash and short-term investments relative to total assets. The shareholder payout ratio is defined as the sum of stock buybacks and dividends relative to sale. The interest coverage ratio (ICR) is cash flow relative to interest expenses. The cash flow refers to operating income minus income tax. Intangibility is intangible assets relative to total assets. The markup rate is sales minus cost of goods sold over cost of goods sold. Finally, the interest burden is calculated as interest expense relative to total debt. Compustat data have large outliers. This heterogeneity dominates the results. To cope with large outliers, most of the ratios used, as means, are winsorized at each tail. As of 30 December 2020, I have 212,556 observations as total after cleaning the data. Table 4.1 summarizes all variables used in this study.

Table 4.1: Definition of Compustat Variables

List of Variables	Definition	Compustat Data Item
Total Debt	Sum of short-term debt and long-term debt	dlc+dltt
Profit Rate	Income before extraordinary items to capital stock	ib/ppent
Markup Rate	Sales minus cost of goods sold over cost of goods sold	(sale-cogs)/cogs
Investment Rate	Capital expenditures to capital stock	$capx_t/ppent_{t-1}$
Cash Holdings	Cash and short-term investments to total assets	che/at
Intangibility	Intangible assets to total assets	intan/at and (intan-gdwl)/at
Capital Stock	Capital stock to total assets	ppent/at
Shareholder Payouts	Sum of stock buybacks and dividends to sale	(prstkc+dvt)/sale
Interest Burden	Interest expense to total debt	xint/(dlc+dltt)
Interest Coverage Ratio	Cash flow to interest expense	(oibdp-txt)/xint
Leverage Ratio	Total debt to total assets	(dlc+dltt)/at
Financial Asset Accumulation	Sum of cash and short-term investments, receivables, investment and advances (other) and investment and advances (equity) over total assets	(che+recco+ivao+ivaeq)/at

Figure 4.1 shows the representativeness of the sample compared to the Financial Account of the U.S. data. This comparison is applied after cleaning the firm-level data. The Compustat database represents about 60% of total NFCs debt and about 45% of total NFCs assets with respect to aggregate U.S. data since the 1990s. This is strong representativeness of the aggregate data even after cleaning processes. Before cleaning processes, the firm-level data covers about 75% of total NFCs debt and about 55% of total NFCs assets with respect to aggregate data since the 1990s.

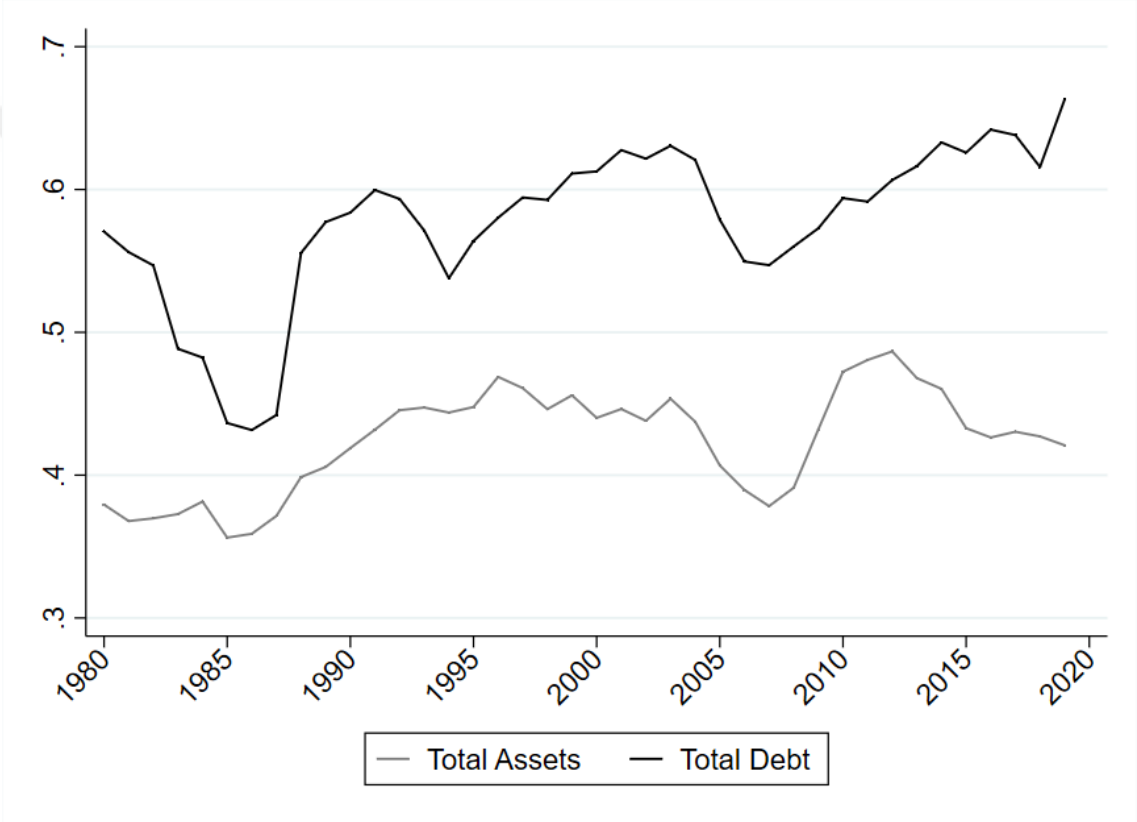

Figure 4.1: Representativeness of the Sample

Note: The variables are calculated as ∑Total Assets $_{i,t}$ / FL102000005$_t$ and ∑Total Debt $_{i,t}$ / LA104104005$_t$
Source: Financial Accounts of the United States (Table D.3, B.103), Compustat, author's calculations

Figure 4.2 presents the distribution of the debt among the firms. The left-hand side of the figure shows the firms ranked by their total debt for each year as Top 100 and Top 1000 firms. The right-hand side of the figure shows the firms classified with the percentile of total assets for each year as Top 10%, Middle 40% and Bottom 50% of firms.

Figure 4.2: Distribution of the Compustat Total Debt

Note: The variables are calculated as follows.
$\sum$Total Debt $_{\text{Top 1000, t}}$ / $\sum$Total Debt $_{\text{i, t}}$
$\sum$Total Debt $_{\text{Top 10%, t}}$ / $\sum$Total Debt $_{\text{i, t}}$
Source: Compustat, author's calculations

Figure 4.2 shows the uneven distribution of debt among the Compustat firms by different size measurements. The outstanding debt is concentrated among the very large firms at both measurements. According to the left-hand side of the figure, almost all outstanding debt is held by Top 1000 firms with respect to their total debt in 2019.

There has been a secular increase in total debt holdings by Top 1000 firms starting from the late 1990s. As for Top 100 firms, more than half of the total outstanding debt is held by those firms over the years. The right-hand side of the figure illustrates the total outstanding debt with respect to firms' total assets. Top 10% firms by firm's total asset hold more than 80% of the total debt for available years. Middle 40% firms hold less than 20% of the total debt and Bottom 50% firms hold almost zero debt with respect to total outstanding debt.

4.2 COMPUSTAT AGGREGATE RATIOS

The growing importance of changing the behavior of NFCs over the years is emphasized at the aggregate level above. In firm-level analysis, compustat is the very first source for this kind of study. The increasing number of studies using compustat database is beneficial for the deeper analysis. In this part, I show the number of significant, stylized facts on compustat non-financial firms by using all samples. Before passing deeper analysis, using compustat database, the question of what is happening in aggregate ratios at the firm level for public non-financial firms over the years would be explanatory. Representativeness of compustat database is strong. After cleaning the data, as of the 1990s, around 60% of total debt and 45% of total assets are captured in this database relative to Financial Accounts of the U.S. NFCs.

Figure 4.3 shows the nine stylized facts on compustat non-financial firms. The definitions of the profit rate, markup rate, investment rate, cash holdings, intangibility, shareholder payout, interest rate, interest coverage rate, and finally leverage are expressed above. The aggregate ratios at the firm-level, the profit rate of the NFCs have experienced secular decrease until the 1990s. After a couple of years of recovering, the rate of profit of the non-financial firms has interrupted with the dot-com crisis and collapsed to below zero levels in 2000. The last two decades have witnessed a rapid increase in profit rate for the non-financial firms, which have been higher than the 1980s-2000s period average. The story is different for the markup rate. The aggregated firm-level markup rate displays rapid increases in the term between 1980 and 1990. After then, the markup rate has settled into about 45% until the GFC. After the GFC, the markup rate begins to move upward and reaches historically high levels by the end of 2019.

It is clearly seen that the investment rate of NFCs fluctuates over the years. In addition to fluctuations, the rate of investment, as a trend, has decreased throughout time. A rapid recovery starting from the 1990s is followed by a severe drop during the dot-com crisis. As of that time, the tendency of falling continued. Another stylized fact is firms' cash holdings. Non-financial firms' cash holdings have seen the lowest level in the 1990s. Since that time, non-financial firms have held more cash. Bates et al. (2009) show that a

dramatic increase in cash holdings of firms is mainly due to increasing cash flow risk. That is to say, firms hold cash for precautionary motives.

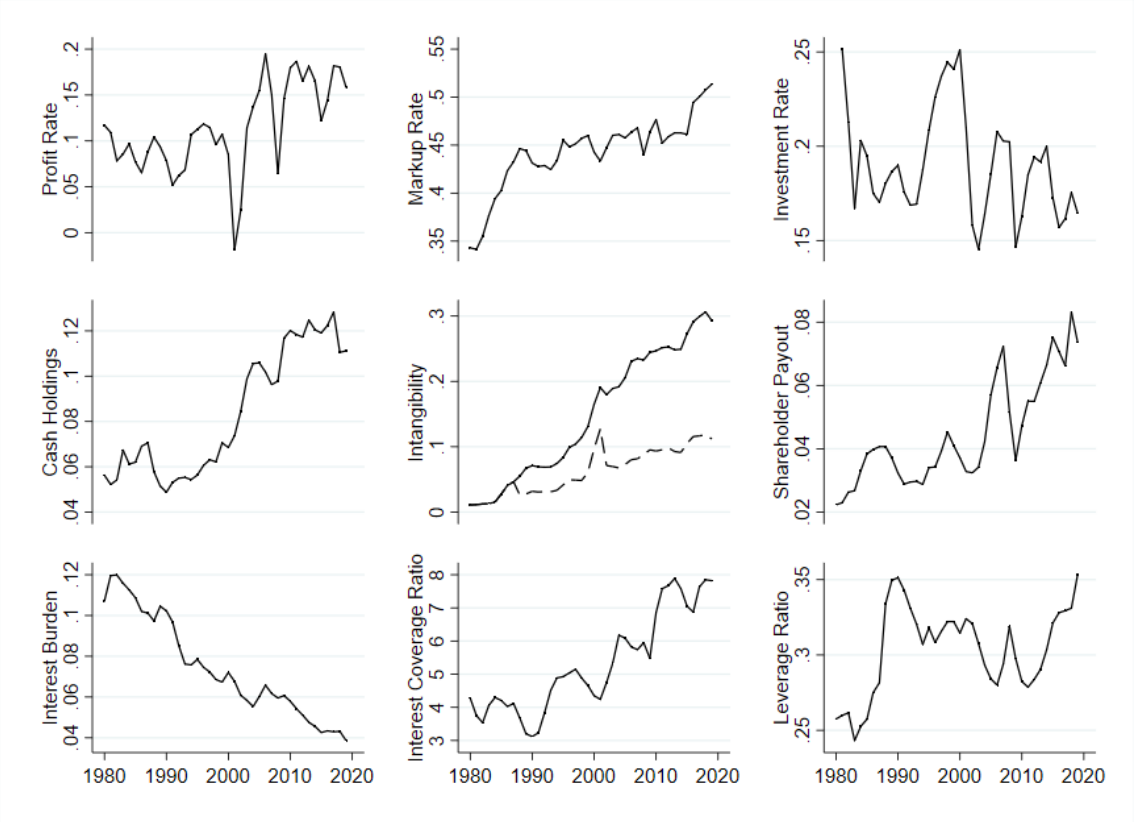

Figure 4.3: Selected Ratios of Compustat All Sample

Notes: All variables used in this figure are first calculated as yearly sums then divided related variables to obtain ratios. The dashes line depicts the intangibility excluding goodwill.
$\sum X_{1\ (i,\ t)} / \sum X_{2\ (i,\ t)}$
Source: Compustat, author's calculations

Foley et al. (2007) analyzed the effect of repatriation taxes and found that the firms hold more cash if they are subject to higher repatriation taxes, especially for multinational companies. Sanchez and Yurdagül (2013), reporters from St. Louis Fed, review the above papers regarding the issue and suggests a policy. Modification of current undesired fiscal policy could help reduce uncertainty and bring profits back to the U.S. and hence reduce cash holdings. Increasing the share of intangible assets in the NFCs balance sheet is a non-negligible issue. The role of intangible assets in the investment-profit puzzle is explained by Orhangazi (2019). He finds that the firm with high intangible asset ratios has high profit rates without increasing correspondent level of investment. According to

data, intangibility, including goodwill, has begun to rise mid-of 1980s and reached 30% percent in 2019.

As stated above, NFCs distribute their sources to shareholders more than before since the 2000s. Lazonick and O'Sullivan (2000) summarize the change of NFCs behavior as *retain and reinvest to downsize and redistribute*. The last two decades show that the shareholder payout grows rapidly compared to the pre-2000s period. Almost 8% of yearly sales are distributed to shareholders as a form of stock buybacks and dividends in 2019. The interest burden figure shows the historical interest cost of debt for NFCs.

After reaching an all-time high during the early 1980s, the cost of debt for NFCs has consistently declined since then. Decreasing the cost of debt of NFCs could possibly ease the borrowing conditions for NFCs and helped accumulate more debt. The interest coverage ratio presents the ability of firms to meet interest obligations by yearly generated income. In help with decreasing interest burden and increasing profits of NFCs, the ICR has gradually increased after the 2000s.

The leverage ratio is the main variable of this study. The rapid increase in leverage starting with the mid-1980s has been followed by a couple of decades of deleveraging. After the GFC, NFCs have piled up so much debt. The leverage of NFCs hit the record level at the end of 2019. To sum up, according to my calculations from the compustat aggregate ratios, NFCs have more leverage even than before.

The newest rapid increase has begun after the GFC. Despite increases in profits, markups and available sources and decreasing interest burden, the investment rate of NFCs tends to decrease over time. Recently, NFCs might enjoy easy monetary conditions, hold more cash, accumulate more intangible assets and distribute more their sources to shareholders as a form of stock buyback and dividend.

To examine in detail, the following parts are dedicated to shed light on this issue. The questions of "Who borrowed?" and "How was it used?" will be asked and analyzed in many aspects throughout the chapter.

4.3 WHO BORROWED?

4.3.1 By Firm Size

The firm size plays a critical role by examining the leverage in capital structure literature. Both pecking order and trade-off theory have predictions on leverage and firm size. The followers of trade-off theory are generally found that large firms have more leverage than small firms. According to the theory, as firm size increases, the firms are exposed to less agency cost thus have less leverage. These firms have a better reputation in markets, and hence the relationship between leverage and firm size ought to be positively related. However, the opposite is true for the pecking order theory. According to the pecking order theory, the theory predicts an inverse relationship between firm size and leverage. Since larger firms face lower adverse selection costs than small firms, larger firms should have less leverage than small firms (Frank and Goyal 2008).

Figure 4.4 presents the leverage ratio for both yearly medians and means with respect to firm size. Size variable is defined as total assets for each year. For each year, the firms' total assets that are bigger or equal to the 90^{th} percentile of total assets regarding the year are classified as "Top 10%". Similarly, the firms' total assets that are bigger or equal to the 50^{th} percentile and lower than the 90^{th} percentile are classified as "Middle 40%", and the rest of the firms are classified as "Bottom 50%".

In general, the figure shows that as firm size increases, leverage increases for both mean and median values. For *large* firms, it is seen that the leverage of large firms has increased from the 1980s to the 2000s, whereas, at the same time, leverage of middle and small firms has decreased. Even so, smaller firms have deleveraged for this period, while large firms have leveraged. After GFC, regardless of firm size, there has been a rapid increase in leverage which is never seen before. As a result, the driving force behind increasing aggregate leverage ratio is likely stemmed from mainly an unprecedented increase in leverage ratios of large and middle firms after the GFC.

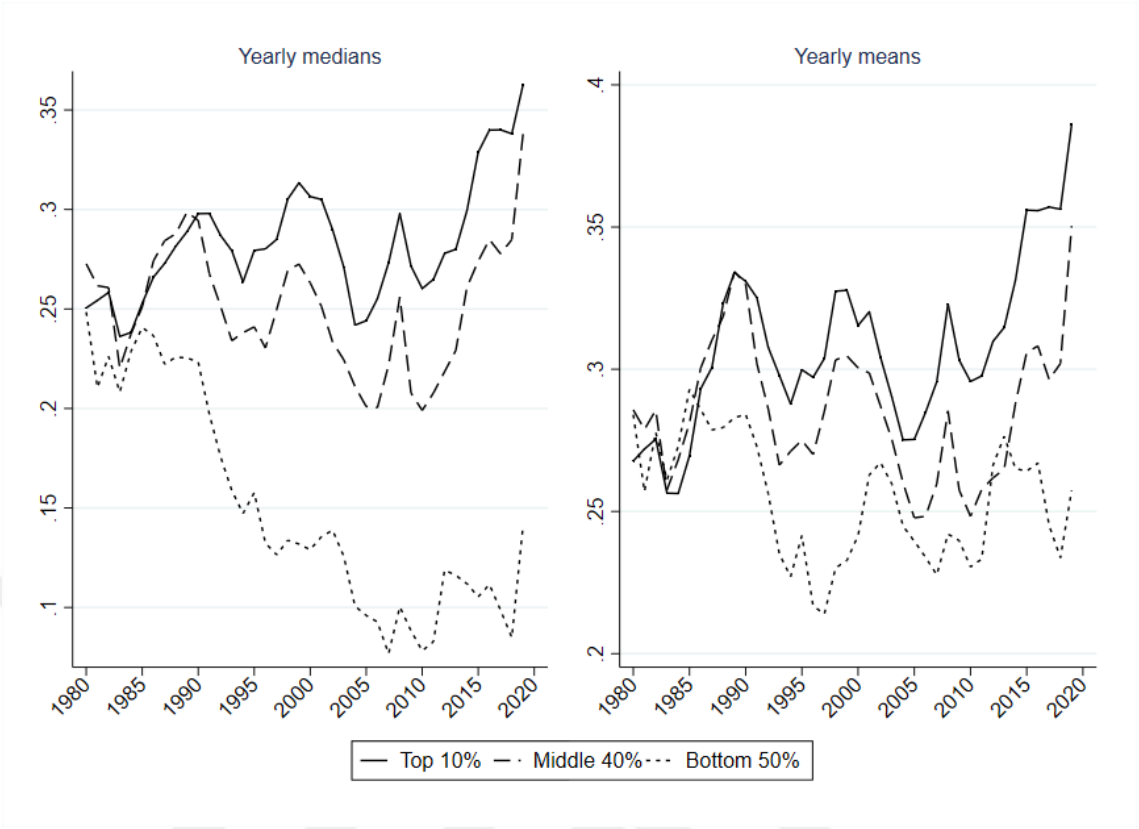

Figure 4.4: Leverage, By Firm Size

Notes: The mean leverage ratio is winsorized at 5% for each tail to cope with large outliers.
Source: Compustat, author's calculations

4.3.2 By Firm Age

The relationship between firm age and leverage is limited in the literature. Fama and French (2002) recognize that the firm age is a proxy of the size factor. Therefore, their expectation is similar for size factor. However, they do not test and show a similar relationship as size factor does. Unlike their expectations, I find the ambiguous or negative relationship between firm age and leverage ratios consistent with the pecking order theory but inconsistent with the trade-off theory. By classifying firms into age groups, I benefit the compustat database firm's unique identification (gvkey) variable. I assign the number "1" for all unique gvkey variable. Then, I sum all assigned numbers and reach the firm age variable. The weak side of this approach is the database itself. For instance, the firm if publicly traded after ten years since first established, the firm is assigned as one year old in my calculations.

Table 4.2: Firm Age Group

Age group	Frequency	Percent	Cumulative
1-10	64,366	30.28	30.28
11-20	62,764	29.53	59.81
21-32	51,034	24.01	83.82
33+	34,392	16.18	100
Total	**212,556**	**100**	

Source: Compustat, author's calculations

Table 4.2 summarizes the age groups. The factor variable of firm age is classified into four groups. The first group consists of the age between 1 to 10, the second group is 11 to 20, the third group is 21 to 32 and the last group is 33+.

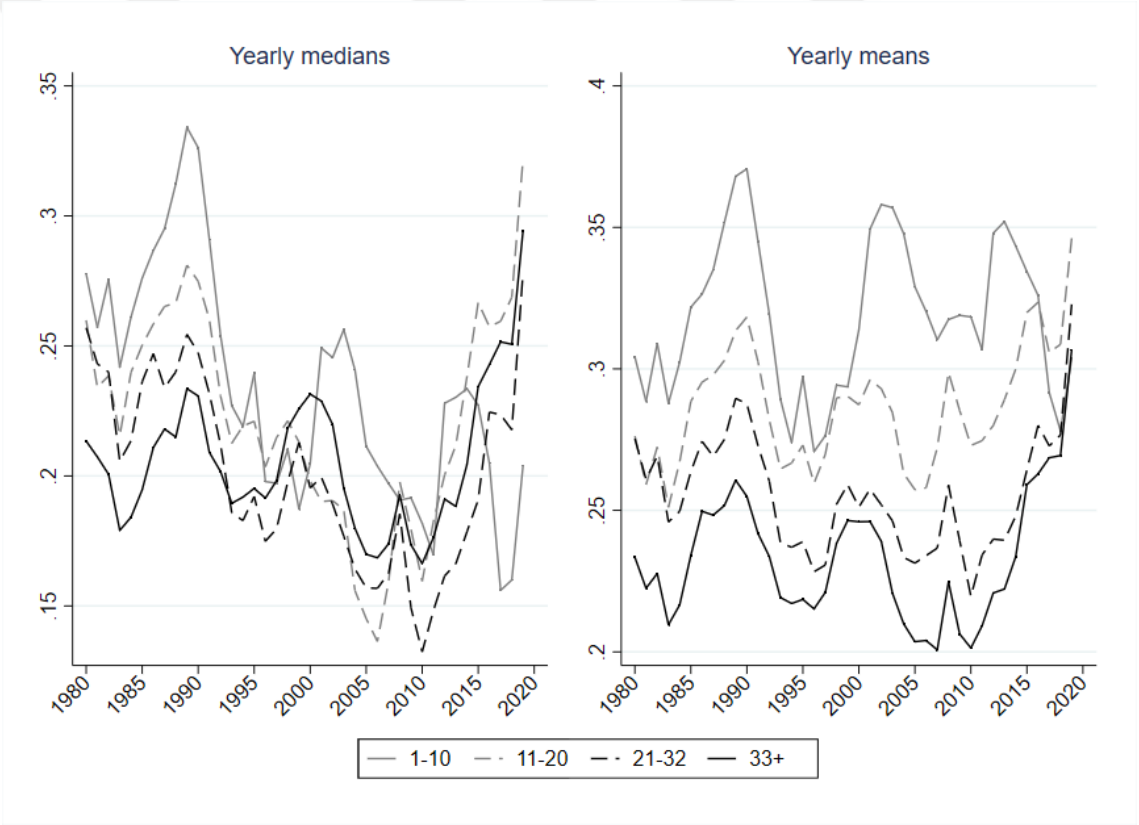

Figure 4.5: Leverage, By Firm Age

Notes: The mean leverage ratio is winsorized at 5% for each tail to cope with large outliers.
Source: Compustat, author's calculations

Figure 4.5 shows the leverage ratios with respect to firm age. According to my calculations, as firms get older, leverage decreases in mean level. This relationship between firm age and leverage is also valid from 1980 to the mid-1990s for median levels.

However, it is hard to show the same relationship for median level after the 2000s. As of 1990s, leverage ratios of each age group of firms tend to decrease until the eve of the GFC. However, after the GFC, the leverage of the youngest firms has remained stagnant or decreased, whereas older firms have been rapidly leveraged both in mean and median levels.

Starting from 2018, all age groups of firms have been rapidly increased their leverage. The main driving force of increasing leverage after the GFC mostly comes from the older firms. As a result, our mean level results are consistent with the pecking order theory, since "older firms have had an opportunity to retain earnings" (Frank and Goyal 2009, 8).

4.3.3 By Industry

The leverage of industries is significantly varied over time. According to trade-off theory, industry leverage is a powerful proxy of capital structure and firm leverage (Frank and Goyal 2009). Lemmon et al. (2008) test and point out that the leverage ratios are different at the interindustry level and Mackay and Phillips (2005) find that leverage ratios differ across industries. That is to say, in line with the theory, managers of firms adjust their leverage ratios with respect to industry median leverage. They also find that the leverage ratios are higher in concentrated industries than others. In this part, our purpose is to show the leverage of firms with respect to industry classification. Industries are classified by using Fama-French industry categorization. Using compustat database SIC codes, the firms are categorized. Since I exclude the utility sector, there are nine sectors left.

Table 4.3 displays the leverage of firms with respect to industry. The figure also shows the number of observations, period mean leverage and period median leverage in industry and total level. According to the table, Telephone and TV Transmission industry's leverage is highest and HiTec and Business Equipment industry's leverage is the lowest during the 1980s. In this period, Telephone and TV Transmission industry's leverage is about 1.3 times bigger than total leverage both in median and mean level. As of the 1990s, the ranking of highest and lowest levered industries has remained unchanged. However, except for industries of Healthcare, HiTec, Other and Wholesale, industry level leverage

has increased between these two periods. In addition to this, total leverage in this period has decreased due to decreasing leverage of these industries' effect. Telephone and TV Transmission industry's leverage ratios have increased and reached about 1.5 times of total leverage during this period. Last but not least, the difference between mean and median leverage ratios for the Healthcare and HiTec sectors have begun to diverge during this period.

The answer behind this question might be hidden in the number of observations between these periods. Besides overall deleveraging, the number of observations has more than doubled for Healthcare and one and half times more for HiTec industries. In other words, less levered and/or small firms have possibly begun to enter the database during this period.

Over the last two decades, the general outlook for average total leverage increased from 27% to 31% in mean level and from 18% to 26% at median level. Like the 1980s and 1990s, the highest and lowest levered industries remain unchanged for the 2000s and 2010s. Throughout these periods, Healthcare and HiTec industries' median leverage is low, compared to other industries and total level. However, Telephone and TV Transmission industry's leverage has increased faster than other industries' leverage ratios. In the 2000s and 2010s, Telephone and TV Transmission industry's leverage is more than 1.5 times of total sample leverage in mean level and more than two times of total sample leverage at median level. Another important thing worth highlighting is an unprecedented increase in Wholesale and Retail industry' leverage. From 2018 to 2019, regarding industry leverage has increased from %33 to %43 in mean level and %28 to %43 in median level. As a result, through 1980s to 2010s, Telephone and TV Transmission industry has constantly accumulated debt. For all periods, its leverage has always been far above compared to other industries. In 2019, in help to a large extent with Wholesale and Retail industry, the leverage ratio of all sample hit record high level. The last two decades leveraging are, along with other industries as well, mainly stemmed from by these industries.

Table 4.3: Leverage, By Fama-French Industry Classifications

	1980s			1990s			2000s			2010-2018			2019		
Industry	N	mean	p50	N	mean	p50	N	mean	p50	N	mean	p50	N	mean	p50
Consumer Durables	1907	0.28	0.24	2023	0.29	0.27	1492	0.30	0.25	1090	0.29	0.20	99	0.35	0.29
Consumer NonDurables	4326	0.28	0.26	4443	0.30	0.27	3128	0.31	0.26	1954	0.28	0.23	160	0.31	0.29
Energy Oil, Gas and Coal	3989	0.30	0.25	3039	0.29	0.26	2886	0.32	0.27	2469	0.35	0.30	178	0.36	0.33
Healthcare, Med Equip and Drugs	3825	0.26	0.19	7817	0.22	0.12	8226	0.22	0.08	7699	0.26	0.10	850	0.26	0.14
HiTec Business Equipment	9288	0.23	0.17	14575	0.19	0.09	13517	0.19	0.06	8086	0.22	0.11	696	0.27	0.21
Manufacturing	10597	0.28	0.24	10250	0.30	0.26	7721	0.31	0.25	4922	0.29	0.24	436	0.32	0.30
Other	8911	0.32	0.29	10517	0.31	0.27	8828	0.31	0.24	5697	0.32	0.25	604	0.34	0.28
Telephone and TV Transmission	1973	0.37	0.32	2753	0.40	0.33	2199	0.43	0.38	1060	0.46	0.44	86	0.46	0.46
Wholesale, Retail and Some Services	7720	0.31	0.29	8710	0.30	0.26	6033	0.29	0.24	3886	0.29	0.24	328	0.43	0.43
Total	**52536**	**0.29**	**0.25**	**64127**	**0.27**	**0.22**	**54030**	**0.27**	**0.18**	**36863**	**0.28**	**0.20**	**3437**	**0.31**	**0.26**

Notes: The mean leverage ratio is winsorized at 5% for each tail to cope with large outliers. Industries are categorized by using Fama-French classifications.
Source: Compustat, author's calculations

4.3.4 By Market Power

4.3.4.1 By Concentration Group

The growing number of studies, reports and news articles recently focus on increasing industrial concentration and market power in the U.S. economy. Davis and Orhangazi (2021) show the rising concentration across industries since the late 1990s. Moreover, they also present the link between industrial concentration and markups, profitability and investment for the NFCs. They find ambiguous evidence in line with the literature that some highly concentrated industries, as expected, have high markups, high profitability and low investment rates, whereas other highly concentrated industries have less than average markups and profits. They use the Census Bureau data to obtain high, mid and low concentrated industries' information[9]. The data give information on 2012. I simply replicated it and categorized industries by using North American Industry Classification System (NAICS) codes both for 3- and 4-digits levels. By using 2012 industrial concentration data, I classified nonfinancial firms as "high", "mid" and "low" for all available years.

Obviously, industrial concentration groups are not static over the years. Industries might replace the positions from low concentration to mid or high concentration groups over the years or vice versa. Even so, taking a constant year as a benchmark still tells a lot of things on the link between leverage and industrial concentration. Figure 4.6 presents the leverage of nonfinancial firms with respect to concentration groups. 4-digits and 3-digits classification are shown separately in the figure, both for the median and mean values. According to the calculations I made, it is clearly seen that the highly concentrated industries have more leveraged than others. It is true for both 4-digits and 3-digits levels and mean and median values. For 4-digits level, while highly concentrated industries leverage ratio has fluctuated but remained range between 30% and 35% until the GFC, mid and low concentrated industries' leverage ratio have decreased for the same period.

[9] For detailed information, see Davis and Orhangazi's (2021) Appendix.

After the GFC, whereas all groups have increased their leverage ratios, highly concentrated industries leverage ratios have rapidly increased and have seen historically high levels.

For 3-digits level, the narrative is more or less the same as the 4-digits level. The difference is that unlike 4-digits level, 3-digits level mid and low concentrated industries leverage are very close to each other over the periods. Highly concentrated industries leverage is by far more leveraged than the other groups. As a result, highly concentrated industries leverage is bigger than the other groups. It is valid for 4- and 3-digits level. However, interestingly, mid concentrated industries leverage ratios are less than low industries leverage ratios for 4-digits level.

Figure 4.6: Leverage, By Concentration Groups

Notes: The mean leverage ratio is winsorized at 5% for each tail to cope with large outliers. Concentration groups are based on Davis and Orhangazi's (2021) classifications.
Source: Compustat, author's calculations

This ambiguity might be related to Davis and Orhangazi's (2021) findings. The competition level of mid and low industries and their size, firm age, markups and profits might be an answer behind this ambiguity. All in all, there is no doubt that the highly concentrated industries have more leverage ratios and skyrocketed their leverage ratios after the GFC.

4.3.4.2 By Profit Rate

In the capital structure literature, profit is the widely used describer to show determinants of leverage. According to the trade-off theory, profitable firms have higher leverage ratios due to low bankruptcy cost and the importance of interest tax shield gain. The positive relationship between leverage and profits is expected by the theory. As regards the pecking order theory, the theory assumes that the relationship between leverage and profit should be negative. According to pecking theory, firms, first, prefer to use internal sources such as profits for financing their investments. Therefore, profitable firms' available internal sources provide them more space for financing their investment. Even so, more profitable firms need less debt. To sum up, there is no consensus between trade-off and pecking order theories on the relationship between leverage and profit (Frank and Goyal 2008).

The empirical evidence finds the negative relationship between leverage and profit. This finding is consistent with the pecking order theory but inconsistent with the trade-off theory (Fama and French 2002; Frank and Goyal 2008; 2009). Although negative relation between leverage and profitability considered as a serious flaw of the trade-off theory, Frank and Goyal (2015) note that the flaw "is not with the theory but with the usage of a leverage ratio in which profitability affects both the numerator and the denominator" (1415). Even so, according to Frank and Goyal (2015), it is only the measurement issue. In this subsection, the relationship between leverage and profits is exhibited. For each year, firms are classified with respect to profit rates. Profit rate classifications consist of four categories.

Each year, firms are ranked as regards profit rates by quartile order. Firms with p25 profit rate and below classified as “Bottom Quartile”, between p25 and p50 “Second Quartile”, between p50 and p75 “Third Quartile” and finally p75 and above “Top Quartile”. Figure 4.7 shows the leverage ratios of firms with respect to profit rate classification. Leverage is calculated yearly as a median and mean level. Figure 4.7 clearly presents that the leverage of top profitable firms is less leveraged than the other firms in almost all available years. However, while the firms with below median profits have tended to decrease its leverage, the firms with above median level profits have tended to increase their leverage from 1980s to 2010s. This is consistent with the pecking order theory but inconsistent with the trade-off theory. Given the figure, firms with high profit rates have more available sources and need fewer external sources than the firms with low profit rates. From 1980 to the GFC, the inverse relationship between leverage and profits in mean level is obvious. However, it is hard to identify in median level.

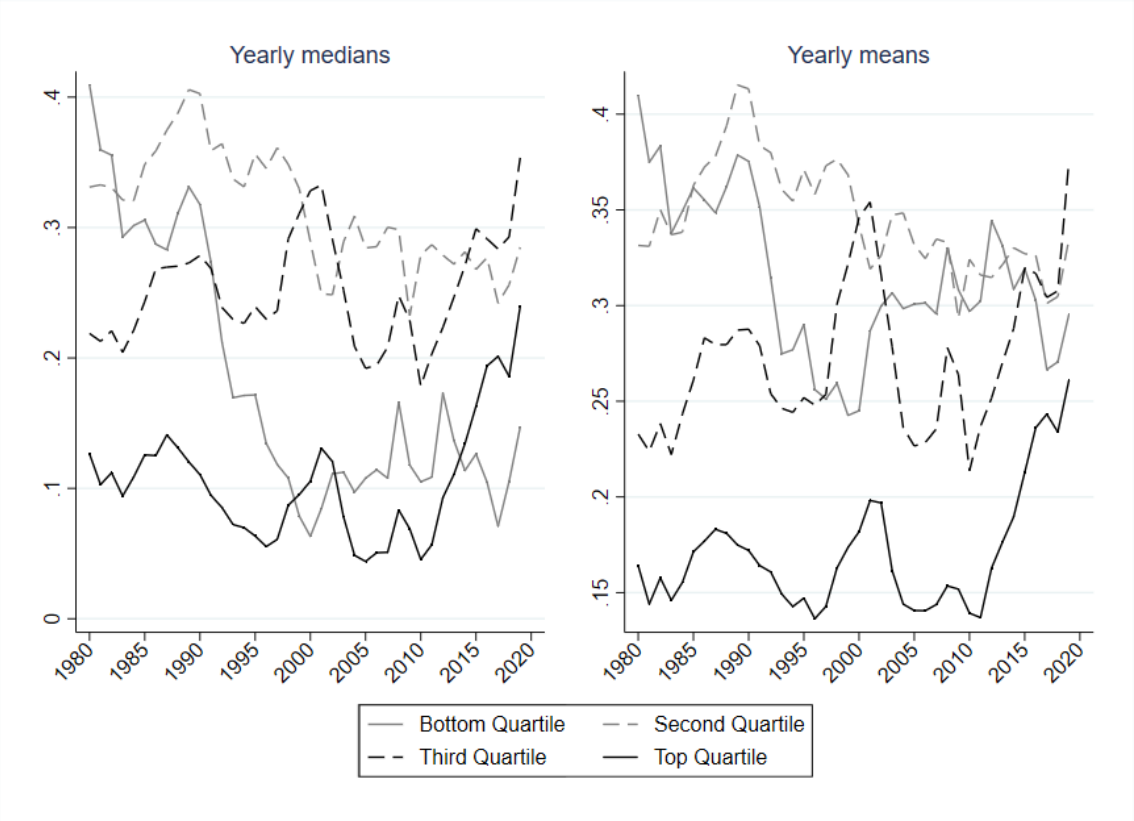

Figure 4.7: Leverage, By Profits

Notes: The mean leverage ratio is winsorized at 5% for each tail to cope with large outliers.
Source: Compustat, author’s calculations

Nevertheless, after the GFC, the gap between high and low profit rate firms' leverage begins to close each other. Recent data show that the inverse relation between leverage and profit rate is hard to define in a descriptive graph. The decreasing gap between high and low profit rate firms' leverage stems from mostly the firms with above median level profit rate. Last decade, the U.S. economy witnessed a rapid increase in leverage ratios, especially in the firms with above median profit rates.

4.3.4.3 By Intangibility

The relationship between leverage and capital stock is widely studied in the literature. Due to collateral power of tangible assets, positive relationship between them is not surprising for the trade-off theory. The argument, as capital stock increases, leverage increases, is consistent with the trade-off theories of debt. However, pecking order theory assumes the opposite relationship between leverage and tangible assets due to low information asymmetry.

Even so, high tangible firms give more information to the market, and thus issuing equity is less costly for these firms thus less levered than other firms emphasized by Harris and Raviv (1991).

The increasing role of intangible assets by explaining capital structure is the relatively more recent topic. A number of studies (Gill and Heller 2019; Horsch, Longoni and Oesch 2019; Lim, Macias and Moeller 2020) have examined the relationship between leverage and intangible assets. Their findings are consistent with each other, and they suggest that the intangible assets reduce financing constraints and support debt financing.

Our descriptive results are also consistent with the related literature. Intangible asset mainly consists of patents, copyrights, trademarks and brand names. Considering goodwill as an intangible asset does not change our descriptive results. Therefore, the variable of goodwill is not excluded from the intangible assets.

Orhangazi (2019), in his recent work, shows the role of intangible assets by explaining the investment-profit puzzle. He emphasizes that the last two decades have been

witnessed increasing usage of intangible assets in the NFCs. He notes that "the increased use intangible assets enable firms to have high profitability without corresponding increase in investment" (1). Here, I divided intangibility into two groups due to characteristic of the database. Until the late 1990s, median intangibility of firms is almost zero percent. Owing to this, intangibility groups consist of "Top 10%" and "Bottom 90%".

Figure 4.8 also shows the leverage ratios for the intangibility group. Given the figure above, there is no doubt that highly intangible firms have more leverage than low intangible firms. This is consistent with the literature's recent findings.

Top 10% intangible firms mostly consist of the Healthcare and HiTec industries. As a result, in line with the literature, intangible assets are as important as tangible assets in explaining leverage ratios, especially in the highly intangible industries.

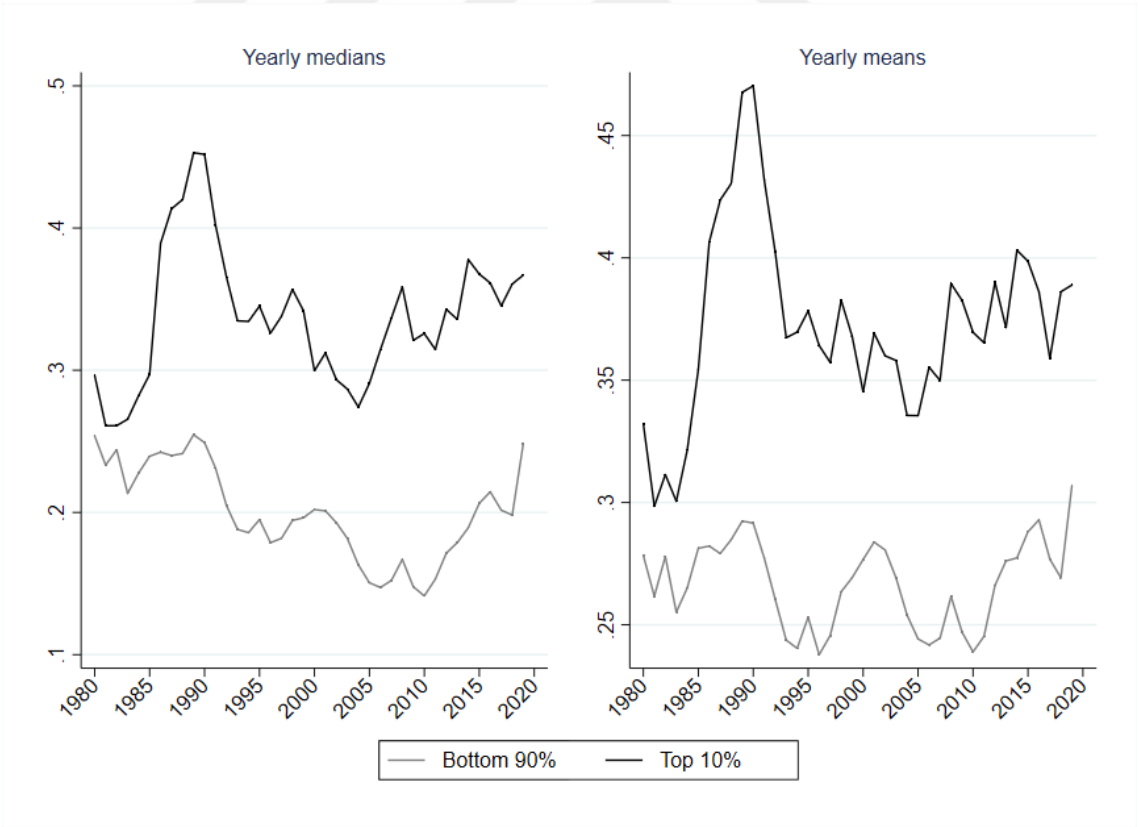

Figure 4.8: Leverage, By Intangibility

Notes: The mean leverage ratio is winsorized at 5% for each tail to cope with large outliers.
Source: Compustat, author's calculations

4.4 HOW WAS IT USED?

4.4.1 Investment

In this part of the chapter, I show the usage of NFCs' debt. Starting from the 1980s, macro and firm-level data show that the investment rates of NFCs have fluctuated but secularly declined as a trend over the years. The long-term and employment-generating investment behavior is replaced with the short-term and speculative investment behavior stated in the literature above. Besides, Mason (2015) and Davis (2016) show that the link between corporate borrowing and investment has disappeared during this period. NFCs pile up so much more debt than before and the purpose behind this will be analyzed following parts.

Figure 4.9 shows the investment rate of the NFCs and the correlation coefficients of borrowing and investment over the period. Here, borrowing is defined as year over year change in total debt relative to assets and investment is capital expenditure relative to capital stock (ppent). After obtaining borrowing and investment variables and before calculating the correlation coefficients, the variables are winsorized at 5% for each tail.

According to the figure, the investment rate of NFCs tends to decrease over the years. Mean values and median values present the same trend for the investment rate of NFCs. Before the dot-com crisis, the investment rate of NFCs hit the record level and never reached the pre-crisis level. As of the early 2000s, the investment rate of NFCs has slowdown and sharply dropped during the GFC. The recent data exhibit the severe drop in the investment rate of NFCs never seen before. As to correlation coefficients between borrowing and investment, the coefficients have permanently declined over the years and approached zero levels. Even so, the positive relationship between borrowing and investment is stronger for the early 1980s but tends to weaker after the 1980s. In 2019, the positive relationship between borrowing and investment had vanished and reached even negative values.

In addition to these findings, in mean and median level rate of investment of NFCs decreases, as firm size increases. The general trend of investment rate is still the same for

all size groups. However, fluctuations of investment rate are bigger for small firms than the large firms over the years. The recent sharp drop in terms of investment rate mostly comes from the small firms and this dominates the average outlook. Related to this, top tangible firms have less rate of investment than the less tangible firms both in mean and median level. As to firms classified with intangibility, the relationship is unclear or ambiguous. The investment rate between high intangible firms and less intangible firms is almost the same and resembles the same pattern over the period. However, looking at the firms by classifying them into concentration groups, data show interesting results. The firms in high concentration groups have less investment rate than the mid and low concentration groups. The lack of competition and thus income guarantee likely allows them to enjoy stable profits without increasing the corresponding level of investment (Additional figures are presented in Appendix A).

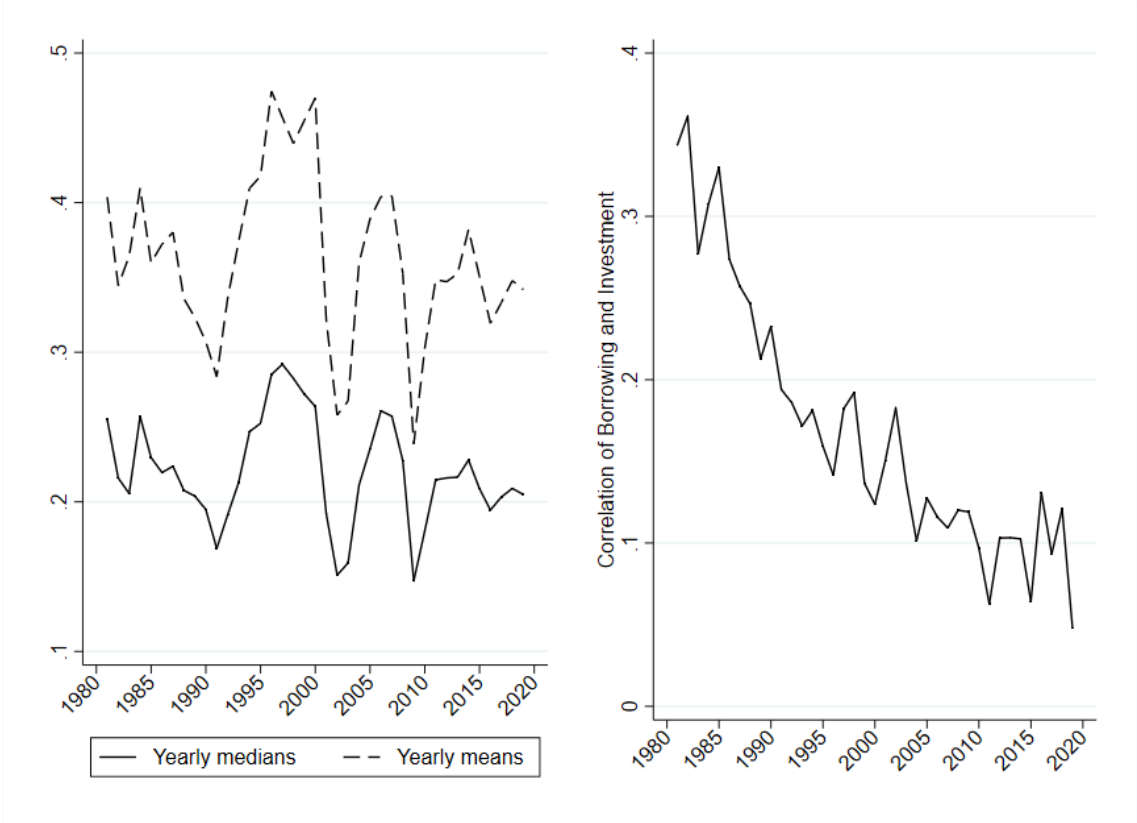

Figure 4.9: Rate of Investment and Correlation of Borrowing and Investment

Notes: The mean investment rate is winsorized at 5% for each tail to cope with large outliers.
Source: Compustat, author's calculations

In short, last 30 years, productive, long-term corporate investment behavior has weakened and replaced with the short-term oriented, speculative investment ideology. Pre-1980s period, money has come into firms, as a form of debt or earnings, and was spent on the physical form of assets. However, the post-1980s period shows that this relation has disappeared or weakened, despite the increasing amount of debt.

4.4.2 Financial Asset Accumulation

The financialization argument is widely understood as the increasing role of financial activities in the economy. Researchers who contribute to the financialization literature analyze the balance sheet of firms and present the shift of composition towards financial asset accumulation instead of physical assets. Early studies on financialization show the increasing share of the financial assets in the total assets, addressing the especially post-1980s period. Both macro and micro-level findings reveal the same results. Considering figure 4.9, the investment rate of NFCs tends to decrease over the period, while their leverage tends to increase. Figure 4.10 shows the evolution of the share of capital stock and financial assets in the total assets. Capital stock is defined as plant, property and equipment over total assets. The financial asset is the sum of cash and short-term investments, receivables, investment and advances (equity method) and investment and advances (other) over total assets. The mean ratios are winsorized at 5% for each tail.

Figure 4.10 presents the share of capital stock and financial assets in total assets over the period. The figure clearly shows the trends both for mean and median levels. As of the 1980s, the capital stock of NFCs has secularly declined until 2019, whereas NFCs have accumulated financial assets during the same period. The last year has shown that the share of the capital stock has sharply increased, while the share of financial assets decreased. The value of financial assets is more volatile than the value of tangible assets. Therefore, during turmoil times such as 2008, the value of financial assets is more affected than the value of the tangible asset. Even so, the recent peak of capital stock might be stemmed from the decreasing value of financial assets without a corresponding increase in capital stock.

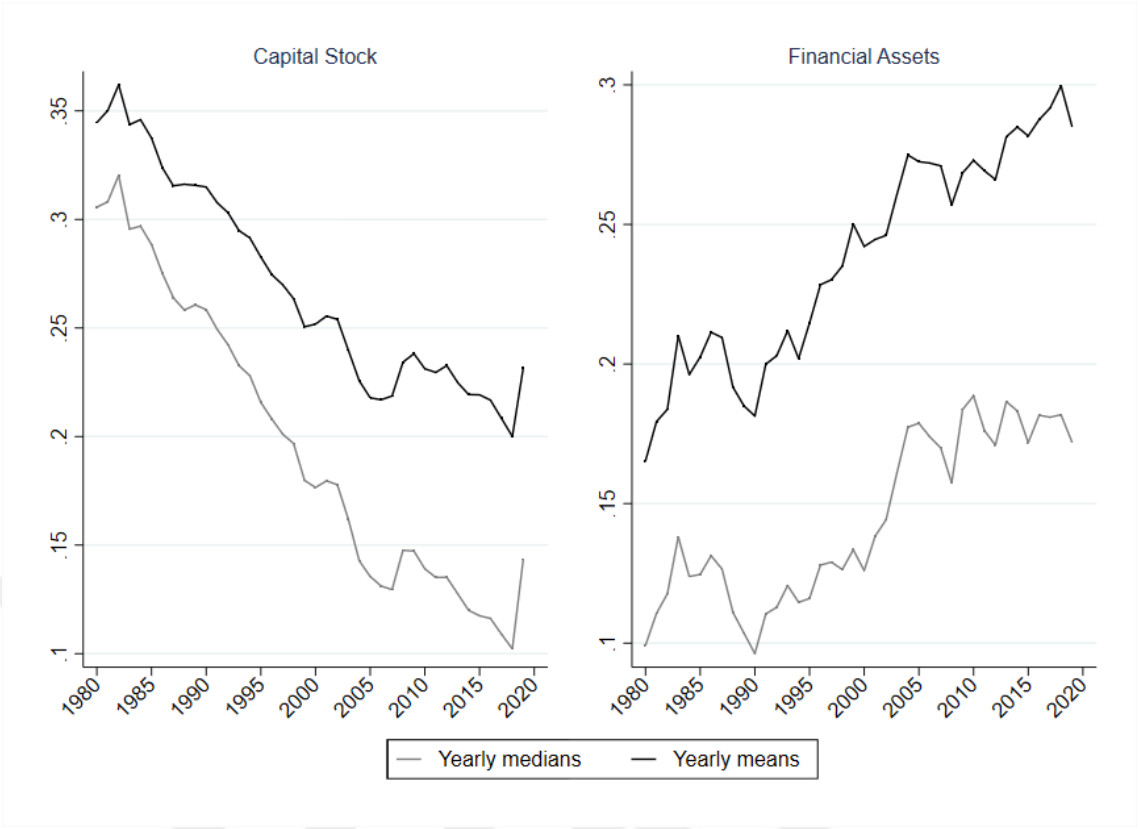

Figure 4.10: Capital Stock and Financial Asset Accumulation

Notes: The mean ratios are winsorized at 5% for each tail to cope with large outliers.
Source: Compustat, author's calculations

To sum up, NFCs accumulate financial assets using their available sources. The share of the tangible form of assets replaced with the share of financial assets. This descriptive figure is consistent with the early financialization literature (Orhangazi 2008a; 2008b). The financial asset accumulation crowds out the tangible asset accumulation. Their earnings from finance-based activities have increased and emphasized in regarding literature. Long-term, employment-generating, physical investment behavior is replaced with short-term, speculative investment behavior. Financial asset accumulation is one of the components of the short-term investment ideology.

4.4.3 Distribution to Shareholders

Shareholder payouts such as dividend and stock buybacks attracted growing attention over the past three decades. Until the 2000s, contributions on the shareholder payments mostly came from the finance side of the literature. These early studies have mostly

examined the dividend policies of the firms. Miller and Modigliani (1961) are considered as a starting point of the dividend policy. They focus on the dividend policy of firms and the effect of dividend payment on the firm's value. Their findings suggest that, under the perfect market assumption and rational behavior, dividend payments do not affect the firm's value. Therefore, the choice of dividend payments is not a case for the firm's capital structure decision, it is irrelevant. After a couple of years, Black (1976) argues that if dividend payments have no effect on firm's value, he raises questions that "What should investors do about dividends in his portfolios and what should corporation do about dividend policy?" (8). The answer is "We don't know" (8).

For four decades, a number of studies analyzed the dividends of firms and reached some stylized facts (Fama and French 2002) in the regarding literature. However, Black's dividend puzzle has not been solved yet in regarding literature. Still, there is no consensus on the payout policy. On the other hand, numerous studies have stressed that something has been changing in corporate governance (Lazonick and O'Sullivan 2000; Mason 2015). Mason (2015) emphasizes the power shift in U.S. corporations from corporate governance model to rentier dominated model since 1980. He shows the weakening link between borrowing and investment to a strengthening link between borrowing and payouts. He named this power shift as *shareholder revolution*. He concludes that, in this term, money comes into the firm as a form of debt or earnings and is distributed to shareholders.

In this part, the evolution of shareholder payouts will be presenting over the years. The shareholder payout is defined as the sum of dividends and stock buybacks over the sales and winsorized at 5% of both tails of the distribution. Figure 4.11 presents the shareholder payouts of the NFCs starting from 1980. In the 1980s, payouts consisted of 2% of the total sales but recently about 4% of the total sales. Mean payouts almost doubled during this term. Every pre-crisis term, such as 1999 and 2008, shareholder payouts have sharply increased. As a result, NFCs distribute their sources more to shareholders as a form of dividends and stock buybacks by using its available sources. In addition to this, large firms have a bigger shareholder payout ratio than the small firms, almost four times bigger than the small firms in 2019.

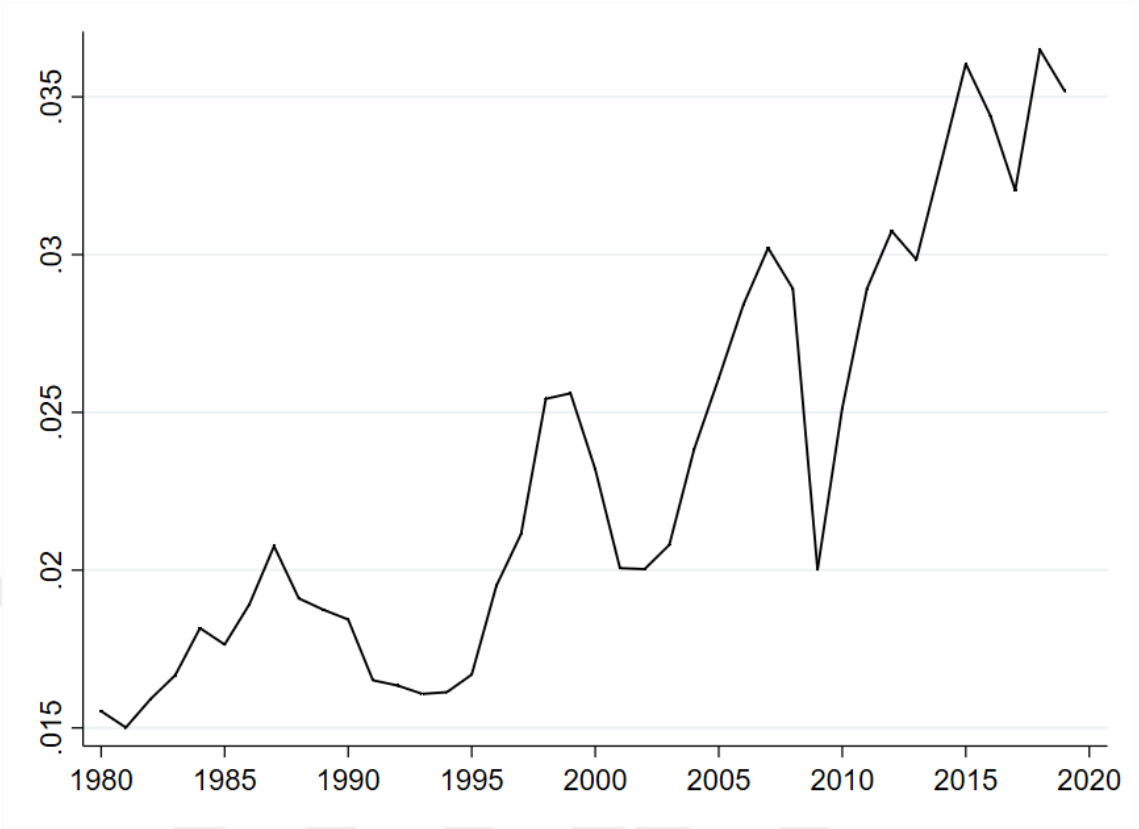

Figure 4.11: Shareholder Payouts

Notes: The mean ratio is winsorized at 5% for each tail to cope with large outliers.
Source: Compustat, author's calculations

The same trend is seen in top profitable firms and high concentrated industries. Firms with high profits and in highly concentrated industries have distributed more payouts to shareholders than the small and in low and mid concentrated industries in 2019. These differences between them are not negligible in terms of heterogeneity of firms (Additional figures are presented in Appendix A).

4.4.4 Intangible Asset Accumulation as a Market Power

Intangible assets, unlike tangible assets, are defined as an immaterialized form of assets, including patents, trademarks, copyrights, goodwill as well as software. The intangible assets do not contain physical substances such as plant, equipment and machinery products. The increasing existence of intangible assets in balance sheets led to arise some concerns about it. Classification of intangible assets in the balance sheet and their valuation method has been a highly complicated issue. Nowadays, holdings of bitcoin

and its accounting under intangible assets are debated in the news.[10] Another concern is the goodwill that is a component of the intangible asset. Goodwill, in a simple accounting manner, is the unidentifiable value paid to the target company during acquisition that is bigger than the target company's market or book value. Goodwill only occurs in the acquisition process. The modern meaning of goodwill is the value of the brand name of the target company etc. Therefore, I separately show the intangible assets and goodwill.

In the previous chapter, the link between highly intangible firms and their leverage is shown. Intangible intensive companies have higher leverage ratios than less intangible intensive companies. Intangible assets, like tangible assets, begin to have collateral power for the companies in order to ease borrowing from the market. Why firms accumulate intangible assets are summarized by Orhangazi (2019). He explains the functions of intangible assets in four themes. First, generating privileges using intangible assets such as patents and thus creating monopolies. Second, creating barriers to entry for specific industries such as Hitec and Healthcare. Third, using trademarks and brand names for pricing power to cope with high competition. Finally, using copyrights for the software, creating value well beyond its production costs.

Figure 4.12 shows the intangible assets as a fraction of the total assets. Intangible assets excluding goodwill are presented separately in the figure. In compustat, reporting goodwill separately from the intangible assets is available from 1988. Data present that in the early 1990s, the share of intangible assets in total assets has been not negligible. However, starting from the late 1990s, the share of intangible assets has begun to increase and reached one to five of total assets in mean level. In some industries such as Hitec, Healthcare and TV, Telephone and Transmission, the share of intangible assets as a fraction of the total assets are way bigger than the sample mean level. In addition to this, by controlling the other variables such as firms by size and profit rates, my results are as follows. Larger firms have more accumulated intangible assets than others. As to profit rates, the firms with high-profit rates have higher intangible assets ratio than others as well.

[10] See for news. https://www.ft.com/content/13540c65-5a9e-41d0-866e-215b2dd2e03c

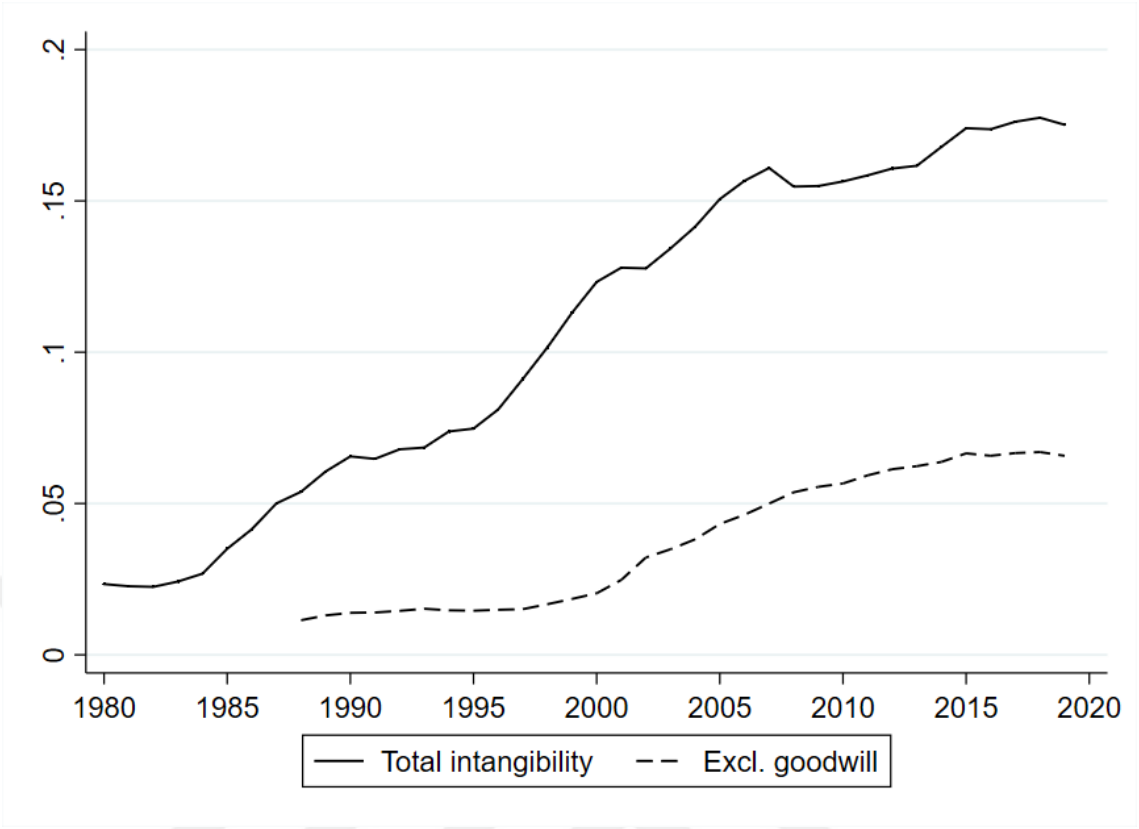

Figure 4.12: Intangible Asset Accumulation

Notes: The mean intangibility ratios are winsorized.at 5% for each tail to cope with large outliers.
Source: Compustat, author's calculations

To sum up, increasing leverage ratios of the NFCs go hand in hand with the increasing share of intangible assets. NFCs accumulate intangible assets since the early 1990s. Recent data show that intangible assets are about 20% of the total assets. Some industries such as Hitec, Healthcare and TV and Transmission are highly intangible intensive industries, about half of the total assets in 2019. Moreover, firm size and profit rates are positively related to intangible intensity. This relationship between them is likely mutually (Additional figures are presented in Appendix A).

4.5 DETERMINANTS OF LEVERAGE

The analysis in Chapter 4, part 5, provides a set of factors that are important for determining leverage. The previous literature focusing on leverage ratio regressions has used a set of factors as follows. In these studies, profits or internal funds, capital stock, industry median leverage, size and shareholder payouts are widely used (Frank and Goyal

2003; 2009; 2015; Lemmon, Roberts and Zender 2008; Lemmon and Zender 2010). Growing attention on increasing intangible asset accumulation in the U.S. (Orhangazi 2019) also promotes me to add intangibility factor to explain leverage of firms. Table 4.4 shows the list of variables used in econometric exercise and its explanations along with compustat codes. As described in Chapter 4, part 1, the sample comes from the annual compustat database and does not subject to any other cleaning processes. The ratio variables are winsorized at 5% level in both tails of the distribution, and the sample that subjects to regression consists of 163,438 observations covering from 1980 to 2019.

The analysis provided in Table 4.5 shows the baseline regression of leverage model with all years (1), by periods (2, 3, 4, 5), by size (6, 7, 8, 9) and Fama-French industry classification (10, 11, 12, 13, 14, 15, 16, 17, 18). The model is as follows. Let $L_{i,t}$ denote the leverage of the firm *i* on date *t*. The factors used in this study expressed at firm *i* at date *t-1* is denoted as $F_{i,t-1}$. The constant is α, and β shows the coefficients of the parameters. The factor variables are lagged one year in line with the previous literature. In addition to this, I adjust standard errors clustering at the firm level, following Frank and Goyal (2009).

$$L_{i,t} = \alpha + \beta F_{i,t-1} + \varepsilon_{i,t}$$

Table 4.4: List of Variables Used in Econometric Exercise

List of Variables	**Definitions**	**Compustat Items**
Leverage	Total debt to total assets	(dlc+dltt)/at
Internal Funds	Cashflow to total asset	(oibdp-txt)/at
Capital Stock	Capital stock to total assets	ppent/at
Intangibility	Intangible assets to total assets	intan/at
Shareholder Payouts	Sum of stock buybacks and dividends to total assets	(prstkc+dvt)/at
Ln (Assets)	Logarithm of total assets deflated to year 2019 using the GDP deflator	Ln(at)
Industry Median Leverage	Industry median leverage for all SIC codes	

Notes: All ratios are winsorized at 5% for each tail to cope with large outliers.

Table 4.5 presents the results of leverage. The results and the sign of independent variables are consistent with previous literature as described above. The factors consist

of internal funds, industry median leverage, capital stock, intangibility, shareholder payouts and the logarithm of assets. Industry median leverage is calculated as the median leverage of all other firms in the same industry in terms of SIC codes. All calculations include firm and year fixed effects and *t-statistics* in which standard errors are clustered at the firm level in parentheses. Table 4.5 consists of 18 columns. In Column (1) of Table 4.5, an overall regression model is presented using available data for "All Years" covering from 1980 to 2019. In Column (2) to (5) of Table 4.5, calculations are reported on a periodic basis. The periods are "1980s", "1990s", "2000s" and "2010s". In the 1980s, these factors account for 9% of the variation in leverage. However, in the 2000s, they account for about 4% of the variation in leverage and 8% of the variation in leverage in the 2010s.

According to Column (1) of Table 4.5, there is a negative relationship between internal funds and leverage, as expected. All other factor variables are positively related to the leverage. It is seen that the biggest impact on the leverage is industry median leverage. Following industry median leverage, the second biggest impact on the leverage is capital stock, and the third is intangibility. The firm size is also positively related and in line with the descriptive results above. Unlike shareholder payout, all factor variables are statistically significant. The impact of internal funds constantly declines over the periods. In Column (2) to (5) of Table 4.5 shows that, in the 1980s, the coefficient of internal funds was -0.15, whereas, in the 2010s, its impact declined to -0.09. There has been a sharp decline in the importance of internal funds in explaining leverage. Concurrently, the effects of industry median leverage and shareholder payouts have both increased their importance by explaining leverage. On the other hand, both capital stock and intangibility have considerable determining power in explaining leverage over the periods. However, the coefficients of both capital stock and intangibility have decreased in the 1980s from 0.19 and 0.22 to 0.14 and 0.13 in 2010s, respectively. Like capital stock, intangibility is also a good descriptor by explaining the leverage of firms.

In Column (6) to (9) of Table 4.5 shows the leverage regression by firm size. As expressed above, firms are classified into three groups with respect to their total assets for each year except for Column (9). In Column (9) of Table 4.5, the Top 1000 firms are ranked with respect to their total debt holdings for each year. By firm size, these factors account for

13% of the variation in leverage for Top 10% firms and 7% for Bottom 50% firms. Colum (6) to (8) of Table 4.5 presents that as firm size decreases, the impact of internal funds increases. Interestingly, unlike middle and small firms, the impact of internal funds in large firms is not statistically significant.

One might possibly say that large firms are not constrained by their available internal funds. Industry median leverage has the biggest impact on firms as a determinant of leverage by firm size. As firms get smaller, the impact of industry median leverage decreases. As to capital stock, its impact on firm leverage is linear. As firm gets smaller, the impact of capital stock increases. However, the story is different for intangibility. The impact of intangibility is the biggest for the middle firms.

Intangible intensive firms are likely concentrated among the Middle 40% of firms, and it might be the one reason behind this impact. In column (1) of Table 4.5, the factor variable, shareholder payouts, is statistically insignificant by explaining leverage. However, estimations I made by firm size, shareholder payouts are statistically significant and positively related with the leverage for Top 10% and Top 1000 firms.

Its coefficient is also bigger than middle and small firms. Unlike Top 10% and Middle 40% firms, the coefficient of shareholder payouts is negatively related to leverage for small firms. In Column (6) to (8) of Table 4.5, the logarithm of total assets by each firm shows the effect of asset size inside the size classifications. In Column (1) of Table 4.5, it can be seen that as firm size increases, leverage of firm increases. Although I do not obtain statistically significant results for the Top 10% of firms, the leverage of Top 10% and Middle 40% of firms is positively related to the asset size. However, it is negatively related to Bottom 50% and Top 1000 firms. Even so, in the Bottom 50% of firms and among Top 1000 firms, as firm size decreases, leverage increases. This also shows the heterogeneity of firms.

Table 4.5: Baseline Model of Leverage

Dependent Variable: Leverage	(1) All Years	(2) 1980s	(3) 1990s	(4) 2000s	(5) 2010s
Internal Funds $_{t-1}$	-0.133***	-0.151***	-0.110***	-0.0943***	-0.0930***
	(0.00631)	(0.0118)	(0.0101)	(0.00994)	(0.0119)
Industry Median Leverage $_{t-1}$	0.305***	0.178***	0.168***	0.213***	0.215***
	(0.0119)	(0.019)	(0.0174)	(0.0185)	(0.0205)
Capital Stock $_{t-1}$	0.206***	0.190***	0.193***	0.180***	0.137***
	(0.0106)	(0.0158)	(0.0149)	(0.0201)	(0.025)
Intangibility $_{t-1}$	0.196***	0.219***	0.157***	0.124***	0.125***
	(0.0107)	(0.0323)	(0.0204)	(0.0161)	(0.0204)
Shareholder Payout $_{t-1}$	0.0199	-0.000149	0.0644	-0.00484	0.0824*
	(0.0209)	(0.0432)	(0.0354)	(0.0287)	(0.0363)
Ln (Assets) $_{t-1}$	0.00390***	0.0168***	0.0150***	-0.00406	-0.00106
	(0.000848)	(0.00132)	(0.00153)	(0.00223)	(0.00337)
Constant	0.0514***	0.00202	0.0600***	0.175***	0.137***
	(0.00916)	(0.0136)	(0.0126)	(0.0163)	(0.023)
Year FE	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES
Clustered SE	YES	YES	YES	YES	YES
R-sq	0.073	0.091	0.061	0.038	0.082
adj. R-sq	0.073	0.091	0.061	0.038	0.081
N	163,438	37,019	47,094	45,507	33,818

Standard errors in parentheses * p<0.05, ** p<0.01, *** p<0.001

Table 4.5: Baseline Model of Leverage (Cont.)

Dependent Variable: Leverage	(6) Top 10%	(7) Middle 40%	(8) Bottom 50%	(9) Top 1000
Internal Funds $_{t-1}$	-0.0483	-0.104***	-0.125***	-0.164***
	(0.0512)	(0.0141)	(0.00695)	(0.0265)
Industry Leverage $_{t-1}$	0.300***	0.282***	0.274***	0.271***
	(0.0279)	(0.0169)	(0.0191)	(0.0201)
Capital Stock $_{t-1}$	0.0900*	0.171***	0.227***	0.0977***
	(0.0374)	(0.0173)	(0.0137)	(0.0248)
Intangibility $_{t-1}$	0.141***	0.231***	0.142***	0.0832***
	(0.03)	(0.0157)	(0.0158)	(0.0212)
Shareholder Payout $_{t-1}$	0.198***	0.0632*	-0.0953**	0.1000**
	(0.0471)	(0.0267)	(0.034)	(0.0333)
Ln (Assets) $_{t-1}$	0.0001	0.0167***	-0.00373**	-0.0206***
	(0.0029)	(0.00144)	(0.00138)	(0.00213)
Constant	0.132*	-0.0590***	0.0826***	0.593***
	(0.0575)	(0.017)	(0.0103)	(0.0354)
Year FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
Clustered SE	YES	YES	YES	YES
R-sq	0.127	0.094	0.066	0.110
adj. R-sq	0.125	0.094	0.065	0.109
N	18,028	69,827	75,583	33,906

Standard errors in parentheses * p<0.05, ** p<0.01, *** p<0.001

Table 4.5: Baseline Model of Leverage (Cont.)

Dependent Variable:	(10)	(11)	(12)	(13)
Leverage	Consumer Durables	Consumer NonDurables	Energy Oil, Gas and Coal	Healthcare, Med Equip and Drugs
Internal Funds $_{t-1}$	-0.128***	-0.164***	-0.169***	-0.117***
	(0.0365)	(0.0319)	(0.024)	(0.0134)
Industry Leverage $_{t-1}$	0.299***	0.246***	0.260***	0.254***
	(0.0665)	(0.0358)	(0.055)	(0.0448)
Capital Stock $_{t-1}$	0.158*	0.108**	0.206***	0.244***
	(0.0663)	(0.039)	(0.0322)	(0.0291)
Intangibility $_{t-1}$	0.288***	0.210***	0.13	0.165***
	(0.0666)	(0.0421)	(0.0737)	(0.0292)
Shareholder Payout $_{t-1}$	0.0632	-0.0717	-0.111	-0.0461
	(0.151)	(0.0915)	(0.0777)	(0.0579)
Ln (Assets) $_{t-1}$	-0.00043	-0.000284	0.0220***	0.00103
	(0.00497)	(0.00329)	(0.00344)	(0.00284)
Constant	0.120*	0.157***	-0.105**	0.0247
	(0.06)	(0.0372)	(0.0359)	(0.0263)
Year FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
Clustered SE	YES	YES	YES	YES
R-sq	0.093	0.08	0.112	0.069
adj. R-sq	0.085	0.076	0.108	0.067
N	5,259	11,157	10,071	20,027

Standard errors in parentheses * p<0.05, ** p<0.01, *** p<0.001

Table 4.5: Baseline Model of Leverage (Cont.)

Dependent Variable:	(14)	(15)	(16)	(17)	(18)
Leverage	HiTec Business Equipment	Manufacturing	Other	Telephone and TV Transmission	Wholesale, Retail and Some Services
Internal Funds $_{t-1}$	-0.118***	-0.152***	-0.148***	-0.0596	-0.135***
	(0.0114)	(0.021)	(0.0171)	(0.0345)	(0.0235)
Industry Leverage $_{t-1}$	0.295***	0.318***	0.280***	0.322***	0.348***
	(0.0358)	(0.0234)	(0.0262)	(0.0669)	(0.034)
Capital Stock $_{t-1}$	0.208***	0.208***	0.214***	0.235***	0.182***
	(0.0258)	(0.0269)	(0.0255)	(0.0472)	(0.0296)
Intangibility $_{t-1}$	0.167***	0.284***	0.166***	0.195***	0.261***
	(0.0183)	(0.0282)	(0.0277)	(0.0484)	(0.0368)
Shareholder Payout $_{t-1}$	0.0213	0.0402	0.0546	-0.0429	0.276***
	(0.0349)	(0.0482)	(0.056)	(0.0947)	(0.0733)
Ln (Assets) $_{t-1}$	-0.00379*	-0.0000721	0.00652**	0.00276	0.00675**
	(0.00171)	(0.0023)	(0.00211)	(0.00418)	(0.00221)
Constant	0.0573***	0.107***	0.0580*	0.0806	0.0285
	(0.0168)	(0.0266)	(0.0227)	(0.0699)	(0.0247)
Year FE	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES
Clustered SE	YES	YES	YES	YES	YES
R-sq	0.066	0.096	0.079	0.093	0.106
adj. R-sq	0.065	0.095	0.078	0.086	0.104
N	36,512	26,878	26,128	6,360	21,046

Standard errors in parentheses * p<0.05, ** p<0.01, *** p<0.001

Column (10) to (18) of Table 4.5 shows the baseline regression of leverage by Fama-French industry classification. By Fama-French industry classification, these factors account for 7% of the variation in leverage for Hitec Business Equipment and 11% for the Energy, Oil, Gas and Coal industry. Except for Telephone and TV Transmission industry, the results of internal funds are statistically significant, and the internal funds are negatively related with leverage for all industry classifications. Moreover, the impact of internal funds is biggest in the Energy, Oil, Gas and Coal industry and lowest for Telephone and TV Transmission industry, which are -0.17, -0.06 respectively. In addition to this, the impact of industry median leverage is the biggest for all industries and biggest within the industry itself.

So to speak, regardless of industry, the impact of industry median leverage is bigger than the other factors. In Column (10) to (18) of Table 4.5, capital stock is one of the most important determiners by explaining leverage for all industries. For all industries, capital stock is statistically significant and positively related to leverage. The intangibility is positively related to leverage for all industries, and intangibility is statistically significant for all industries, excluding Energy, Oil, Gas and Coal industry by determining leverage. The results of shareholder payout are varied over the industry. The result of shareholder payout is statistically significant only in the Wholesale, Retail and Some Services industries. The coefficient of shareholder payout in this industry is relatively high. Among 18 columns, the biggest impact of shareholder payout comes from column (18). The sign of this factor variable is also varied. Some industries have positive coefficients, but some have not. Like shareholder payout, the logarithm of assets representing firm size is also varied over industries.

In this econometric exercise, I use the publicly traded U.S. firms over the period from 1980 to 2019, along with the firm size and Fama-French industry classification. I begin a large set of factors used in previous studies and add another factor which is started to discuss in terms of its role. According to my estimations, I find as follows.

- Firms in high median leverage industries have high leverage tend to have high leverage. The impact of this is larger for Top 10% of firms and Wholesale, Retail and Some Services industry.
- Firms with more tangible assets tend to have more leverage. The impact of capital stock is higher for the Bottom 50% of firms and in Healthcare industry.
- Firms with more intangible assets tend to have more leverage. The impact of intangibility is higher for the Middle 40% of firms and the Consumer Durables industry.
- Firms with more available internal funds tend to have less leverage. This is true for smaller firms and all industries, excluding Telephone, TV and Transmission industries.
- The impact of shareholder payouts is larger in the 2010s. Firms that pay shareholder payout as a form of dividends and stock buybacks have more leverage. The impact of this factor is higher for Top 10% of firms and Wholesale, Retail and Some Services industries.
- Larger firms tend to have high leverage.

4.6 SUMMARY OF THE CHAPTER

This chapter consists of six parts, including the summary part. In the first part, data and cleaning of the data are explained. The variables used in this study are introduced, and some beneficiary information is given. In the second part, the general outlook of NFCs is presented over the years by using some selected ratios. Briefly, these ratios give a very quick summary for the NFCs and help provide a bigger picture for the following sub-parts by using different calculation methods. In the third part of the chapter, the leverage ratio of the NFCs is presented by firm size, firm age, industry and market power in mean and median level. In the fourth part, the purpose and use of increasing debt, and available sources of the NFCs are discussed. Its investment rate, financial asset accumulation, shareholder payouts and intangible asset accumulation are illustrated. The final part of this chapter is dedicated to econometric exercise. In this econometric exercise, I benefit from the publicly traded U.S. firms over the period from 1980 to 2019, along with firm size and Fama-French industry classification.

My general findings in this chapter as follows. The firms, when ranked by size, as firm size increases, leverage increases. Highly leveraged firms are concentrated among the Top 10% of firms by asset size. The last decade has witnessed a rapid increase in leverage ratios for all sizes of NFCs. As to firm age, findings are controversial in mean and median levels. It is easier to say that the mean leverage ratio is bigger for the younger firms than the older firms, except for the last five years. However, the common thing is that both in mean and median level, firms have rapidly levered by all firm age groups, excluding youngest group, during last decade. Meanwhile, in the last decade, the link between firm age and leverage begins to disappear. Regardless of firm age, the leverage of all age groups converges to each other. At the industry level, Telephone and TV Transmission industry have the highest mean and median leverage ratio for all periods. Although the leverage of the Wholesale and Retail industry stable for 30 years, their leverage has rapidly increased after the GFC from about 30% to 43% in mean and median level.

The control variable of market power consists of three elements. First, by profit rates. Second, by concentration groups and third, by type of asset. By profits, as expected, the firms with high-profit rates have low leverage ratios in every aspect. It is seen that the firms with high-profit rates have possibly more available sources to finance their activities and need less debt than other firms. However, similar to the firm age, the relationship between profits and leverage starts to weaken as of the GFC. The gap between other groups in terms of leverage begins to narrow during the same period. It is interesting that the firms with higher leverage ratios are concentrated in highly concentrated industries. The leverage ratio of highly concentrated industries is way bigger than the mid and low concentrated industries. This is true for both three digits and four digits industry classification.

Unlike control variables of firm age and profits, the gap between high, mid, and low concentrated industries with respect to leverage ratios does not narrow during the last decade. Instead, the gap between them widens in terms of leverage. Even so, the link between high concentration and high leverage ratios is considerable, and the role of debt as market power is likely a potential answer behind this, as stressed by Baines and Hager (2021). By type of assets, the firms with high tangible asset ratios have a high leverage ratio. Still, the existence of tangible assets is a strong determiner of leverage for NFCs.

Moreover, like capital stock, highly intangible firms have high leverage ratios. The link between intangible assets and leverage is relatively new literature (Lim, Macias and Moeller 2020), and they exhibit the same results so far.

After discussing piling up so much more debt, showing increased profits, the purpose and use of debt are presented. The investment rate of NFCs tends to decrease over time. The correlation between borrowing and investment has begun to weaken as of the 1980s, recently almost zero correlation between them and even negative in 2019. Despite growing debt and available sources, the investment rate of NFCs does not increase at the corresponding level. NFCs begin to accumulate financial assets since the 1980s. The share of tangible assets is lower than the financial assets. Changing behavior of NFCs from long-term behavior to short-term behavior is addressed. In addition to this, more money comes into the firms as a form of debt and earnings, but more money goes out from the firms as a shareholder payout (Mason 2015). Intangible assets also play an important role in the economy, as stressed by Orhangazi (2019). NFCs have been heavily accumulating intangible assets since the 1990s. The existence of intangible assets possibly gives the firms a market power or a guarantee for future cash flow without increasing the corresponding level of real investment.

In line with the descriptive results, my econometric exercise shows similar results. Even so, the importance of set of factors in explaining leverage is varied in terms of firm characteristics. Large firms are less constrained by internal funds and distribute their sources more to shareholders as a form of dividends and stock buybacks than the small firms, even though their leverage is higher than the small firms. Although large firms access the external funds more than small firms, their investment rate is lower than the small firms. Instead, they accumulate more intangible assets than the small firms. As a result of this chapter, one can say that uneven distribution of debt leads to unequal accumulation. Therefore, the next chapter is dedicated to unequal consequences of debt in terms of the uneven distribution of debt.

5. FRAGILITY

There is growing attention on the leverage and financial fragility in recent news, media and academic studies. Leverage is the widely used indicator of firms' fragility. Minsky and his followers have focused on debt and its effect on financial fragility. Theoretical works using Minskian approach have been conducting almost 40 years. However, very limited empirical work recently analyzed the firms by arming Minskian views and interpretation of the *Financial Instability Hypothesis* (Mulligan 2013; Filho, Martins and Miaguti 2018; Nishi 2019; Davis, de Souza and Hernandez 2019; Pedrosa 2019). Minsky becomes popular in the aftermath of the GFC. Even former Fed Chair Yellen presented him in 2009 to understand boom and bust periods in the economy[11]. Minsky (1972; 1992; 2008) classifies firms into three units, *hedge* unit, *speculative* unit and *ponzi* unit. This classification is based on their capacity to meet financial obligations.

Hedge firms can generate available sources more than their interest and principal debt payments. Speculative firms can meet their interest payment but must borrow to roll over their principal debt payments. Finally, ponzi firms cannot generate sufficient cash flow to meet their neither interest payments nor principal debt payments. Ponzi firms, in this respect, most fragile firms among others. According to Financial Instability Hypothesis, during good time, future expectations are good, and firms want to borrow more. Therefore, the expansionary era goes hand in hand with increasing leverage for firms. However, as leverage increases, their interest repayments, principal debt repayments and thus financial fragility increase. A possible turmoil stemming from exogenous or endogenous dynamics turns firms from hedge to speculative or speculative to ponzi unit. Briefly, Minsky summarizes this process as *stability breeds instability*.

5.1 ZOMBIE or PONZI FIRMS

The definition of zombie firms is several. The works published in BIS, such as McGowan et al. (2018) and Banerjee and Hofmann (2018; 2020), use more or less similar

[11] Yellen, Janet, 2009. https://www.frbsf.org/our-district/press/presidents-speeches/yellen-speeches/2009/april/yellen-minsky-meltdown-central-bankers/

definitions to identify zombie firms. They look at firms' interest coverage ratios for several periods. If firms' interest coverage ratios are less than one for three years and firms are older than ten years old, they classify firms as a zombie. In addition to this, using Tobin's Q method, they extend their classification method and decide whether firms are below or above median level as an additional measurement. Here, in this study, I employ the Minskian typology expressed above (hedge, speculative, ponzi). I follow Davis et al.'s (2019) very clear classification interpreted by Minsky and categorize firms into three financing regimes. Table 5.1 presents the summary of this classification.

Table 5.1: Minskian Firm Classifications

Regime	Definition of regime
Hedge	[Sources of cash - Interest Payments - Principal Payments] > 0
Speculative	[Sources of cash - Interest Payments] > 0 and [Sources of cash - Interest Payments - Principal Payments] < 0
Ponzi	[Sources of cash - Interest Payments] < 0

Source: Davis et al. (2019)

I follow the variables used in Davis et al. (2019) in order to obtain sources of cash. Sources of cash variable consist of the three main components. First, *funds from operations* (item #110), which is a primary source of the firms. Second, *funds from investment activities* (item #107 and #109) and finally, *other funds from current activities* (item #218). In compustat, primary sources of cash item (item #110) have lots of missing values. However, using their components is sufficient in order to cope with missing values. Funds from operations are the sum of income before extraordinary items (item #18), interest and related expenses (item #15), depreciation and amortization (item #14), extraordinary items and discontinued operations (item #48), deferred taxes (item #126), equity in net loss (item #106), sale of property, plant and equipment, and sale of investment (loss) (item #213), other funds from operations (item #217).

Funds from investment activities (item #107 and #109) and other funds from current activities (item #218) are taken as is. Moreover, components of primary sources, funds from operations, differ with respect to availability level. Missing values of items #18, #15, #14 and #48 are treated as missing. However, missing values of items #126, #106, #213, #217, #107, #109 and #218 are treated as zero. Principal payments consist of debt

in current liabilities (item #34), accounts payable (item #70) and current liabilities other (item #72). Interest payments are the interest and related expenses (item #15). After generating all variables, the typology of Minskian firms can be obtained. Table 5.2 shows the number of observations over the periods by Minskian typology.

Table 5.2: Average Number of Firms over the periods by Minskian Classifications

	1980s	**1990s**	**2000s**	**2010-2018**	**2019**
Hedge	1,132	1,006	905	748	569
Speculative	3,008	3,404	2,439	1,804	1,457
Ponzi	988	1,676	1,670	1,330	1,134
Total	5,128	6,086	5,013	3,883	3,160

Source: Compustat, Author's calculations

Figure 5.1 shows the ratio of total firms in the NFCs under Minskian classification. Sample covers from 1980 to 2019. According to the calculations, the share of hedge firms in the total sample remains stagnant over the periods at around 20% of the total firms, whereas speculative and ponzi firms have fluctuated over the years. In the early 1980s, the number of ponzi firms is the smallest group, even below the hedge firms, and speculative firms are the dominant group. However, in the late 1980s, the ratio of ponzi firms has exceeded the ratio of hedge firms. The replacement mostly comes from the change between speculative firms and ponzi firms. An increasing number of ponzi firms is concentrated during the 1980s to early 2000s. At that time, the share of ponzi firms has grown from 10% in 1980 to 38% in 2002 peak. Concurrently, the share of speculative firms has declined from %67 in 1980 to %47 in 2002 drop.

Following the years 2002, the ratio of ponzi firms has declined mostly due to the bankruptcy and exiting data. Therefore, an increase in the share of hedge and speculative firms is inevitable. In the aftermath of the GFC, the share of hedge and speculative firms has declined, while the share of ponzi firms has increased. The second peak was reached by ponzi firms in 2013, 38% of the total firms. As stated in Pedrosa (2019), hedge firms are more robust than speculative firms, which are more robust than ponzi firms. According to Minsky, as the share of hedge firms increases, the economy becomes more robust and anticyclical over time. Despite the procyclicality of speculative and ponzi firms, hedge firms are anticyclical in terms of financial stability over the periods.

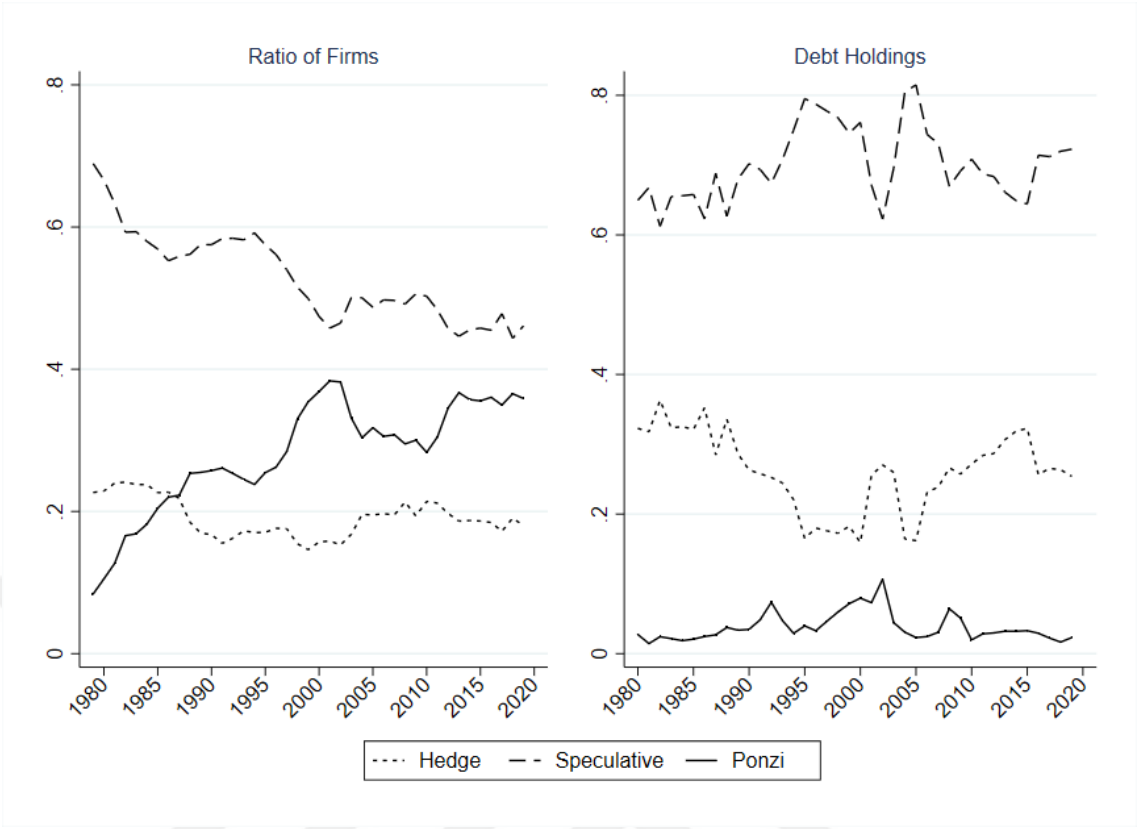

Figure 5.1: Ratio of Firms and Debt Holdings by Minskian Classifications

Notes: The debt is calculated as yearly sums method.
$\sum$Number of Firms $_{(\text{Minskian class., t})}$ / $\sum$Number of Firms $_{(\text{i, t})}$
$\sum$Total Debt $_{(\text{Minskian class., t})}$ / $\sum$Total Debt $_{(\text{i, t})}$
Source: Compustat, author's calculations

The right-hand side of the figure also shows the debt holdings by each group as a fraction of sample total debt. While the share of ponzi firms increases, their debt holdings over total sample debt remains low. Even so, increasing the share of ponzi firms, in this case, might not imply the increasing systemic risk on the economy. Although there is a peak level in 2002 for the ponzi firms, which is almost 11% of the total sample debt and 38% of the total firms, ponzi firms hold about %2 of the total sample debt, whereas the share of ponzi firms is about 36% in 2019. Nevertheless, the allocation of debt holdings by ponzi firms might trigger the systemic risk. Over the period, debt holdings by speculative firms are the biggest group. On average, speculative firms hold about 70% of the total sample debt, while hedge firms hold about 26% of the total sample debt. Peaks and drops regarding debt holdings realize among speculative and hedge firms.

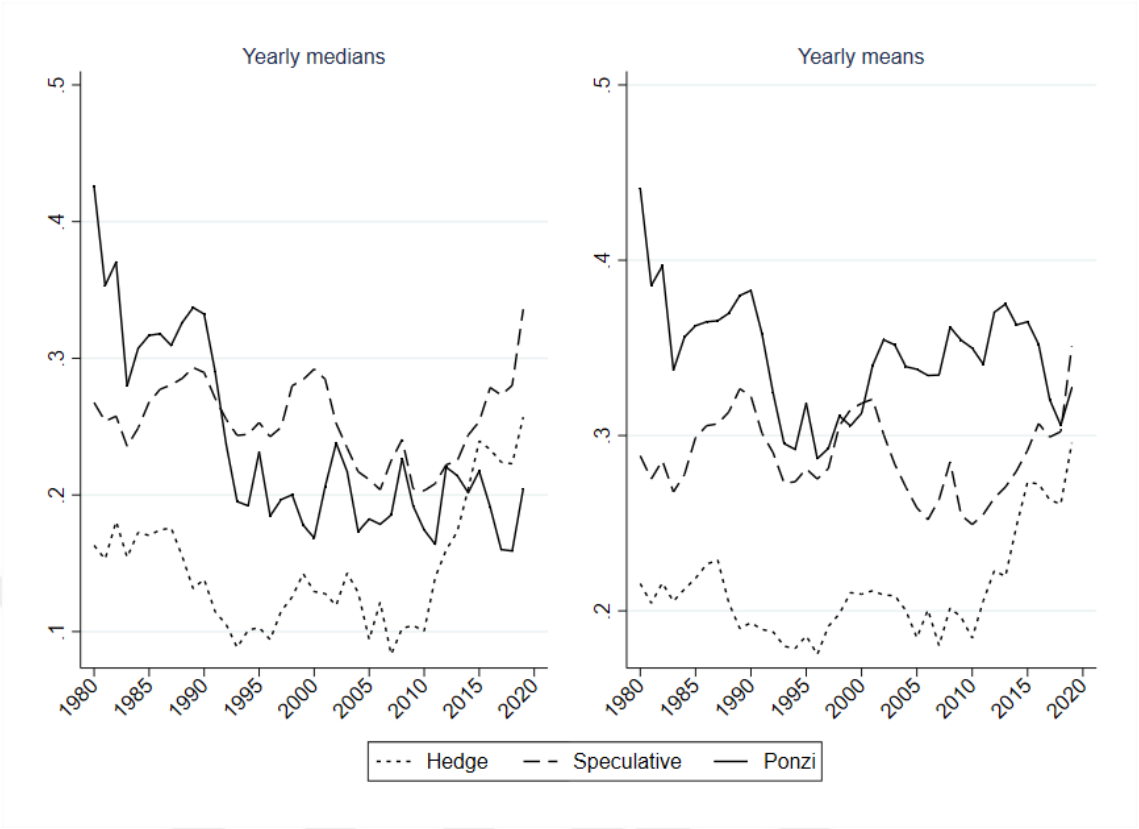

Figure 5.2: Leverage by Minskian Classifications

Notes: The mean leverage ratio is winsorized at 5% for each tail to cope with large outliers.
Source: Compustat, author's calculations

Figure 5.2 shows the leverage of firms by Minskian classifications at both mean and median levels. According to the figure, the leverage of hedge firms is smaller than the other groups from 1980 to early 2010s, and it is valid for both mean and median levels. However, there has been a rapid increase in leverage ratios for hedge firms since the early 2010s. The leverage of speculative firms has been a corridor between 25% and 30% from 1980 to the early 2010s. Similar to the hedge firms, their leverage has dramatically increased after 2010. As for ponzi firms, there has been a sharp deleveraging from 1980 to mid of the 1990s at both mean and median levels. After then, median leverage of ponzi firms has been stationary over the periods, whereas mean leverage of ponzi firms has increased their leverage up to the GFC. The last decade has witnessed a sharp deleveraging for the ponzi firms at mean level except for the last available year. In 2019, Each group by Minskian classifications and each level, there has been an increase in leverage for all Minskian firms at mean and median levels.

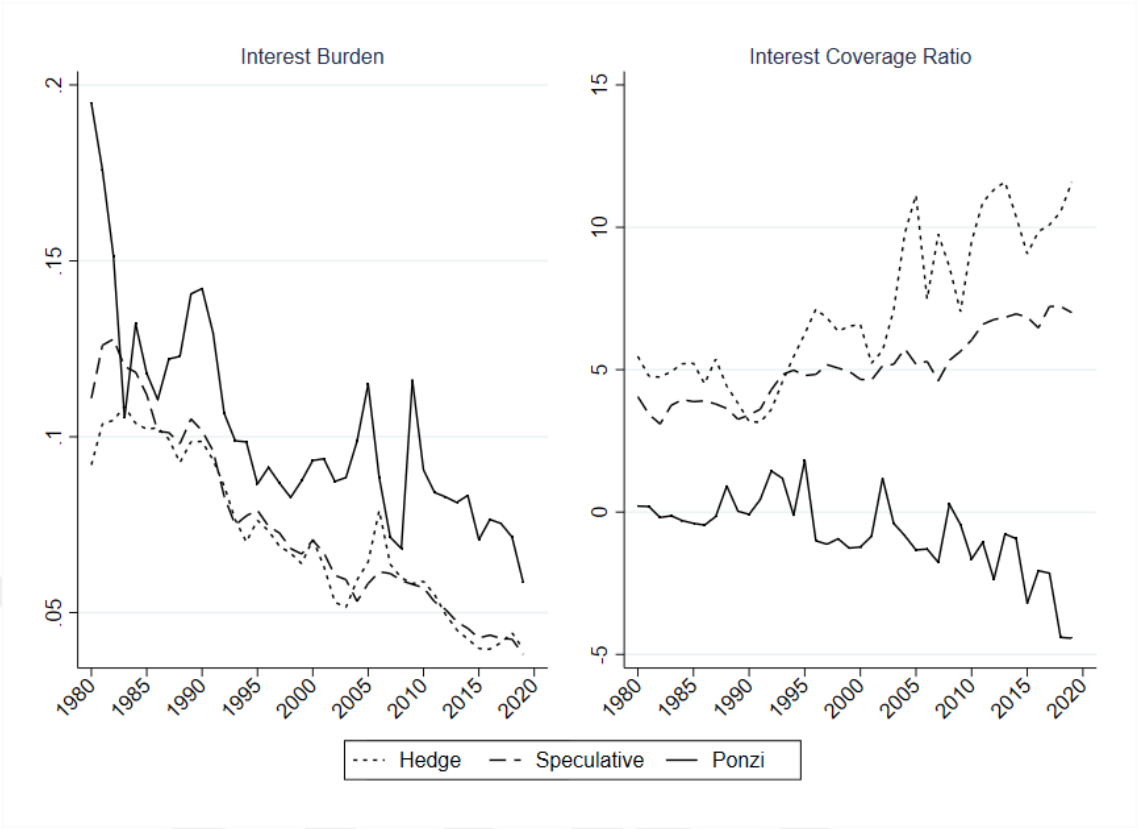

Figure 5.3: Interest Burden and Interest Coverage Ratio by Minskian Classifications

Note: Interest expenses, cash flows and total debt are calculated as yearly sums by Minskian classifications.
$\sum$Interest Expense $_{(\text{Minskian class., t})}$ / $\sum$Total Debt $_{(\text{Minskian class., t})}$
$\sum$Cash Flow $_{(\text{Minskian class., t})}$ / $\sum$Interest Expense $_{(\text{Minskian class., t})}$
Source: Compustat, author's calculations

Figure 5.3 shows the interest rate burden and the interest coverage ratio of firms by Minskian classification. The left-hand side of the figure presents that over the period, while hedge and speculative firms' interest rate burden go hand in hand, ponzi firms' interest rate burden is bigger than hedge and speculative firms and also more volatile than the others. Even so, ponzi firms borrow more expensive than the other group of firms. This forces them into impasse conditions. Ponzi firms have inherently lack of sources of funds and thus their ability to repay interest gets even harder and harder. Once the firm joins the ponzi group, their chance to escape this group harder than to join.

Their balance sheet and other statements worsen and their credibility decreases. Financial firms lend them less loan or want them to pay more risk premium (i.e., embedding more interest rate). This ponzi trap will likely be culminating by filing the bankruptcy process. The right-hand side of the figure might be a supportive source of the above statement.

Cashflow of ponzi firms does not meet their interest repayments. The right-hand side of the figure also illustrates the interest coverage ratio of hedge and speculative firms. Beginning from the 1980s to the early 2000s, the gap between hedge and speculative firms is small. However, starting from the 2000s, the gap between them widens. Meanwhile, by the same period, the ICR of ponzi firms decreases under zero level, meaning that interest payments of ponzi firms exceed their cash flow. The last decade shows that whereas the ability of interest repayments of hedge and speculative firms improves, the ability of interest repayments of ponzi firms goes worse and reaches their interest repayment almost five times bigger than their cash flow in 2019. That is to say, unlike ponzi firms, speculative and hedge firms enjoy easy money conditions during the last decade.

Figure 5.4 illustrates the ratio of hedge, speculative and ponzi firms by size. In line with the literature, Davis et al. (2019) and Pedrosa (2019), ponzi firms are concentrated among the small firms by asset size. The figure presents the negative relationship between asset size and the share of ponzi firms. As firm size increases, the share of ponzi firms decreases. In addition to this, there is a positive relationship between firm size and the share of speculative and hedge firms. Speculative and hedge firms are mostly concentrated among the large firms.

The share of ponzi firms in the bottom quartile almost tripled during the 1980s. Ten years between 1990 and 2000, the ratio of ponzi firms in the bottom quartile has remained stable. After that, the ratio of ponzi firms in the bottom quartile has begun to increase and reached to 80% in 2019. According to figure 5.4, in top quartile, the share of hedge, speculative and ponzi firms stagnates over the period. The average share of ponzi firms in top quartile is 5.2% and 24.4% for the share of hedge and 70.4% for the share of speculative firms. The top quartile firms hold about 95% of the total sample debt in the years between 1980 and 2019. In top quartile, it is seen that the firms' positions are more stable. In the previous literature, firm age is considered as part of the definition of zombie firms (McGowan, Andrews and Millot 2018; Banerjee and Hofmann 2018). Here, I look for the share of firms by Minskian typology and age groups in Figure 5.5. McGowan et al. (2018) present in their cross-country study that the ratio of zombie firms in young firms is smaller than the older firms.

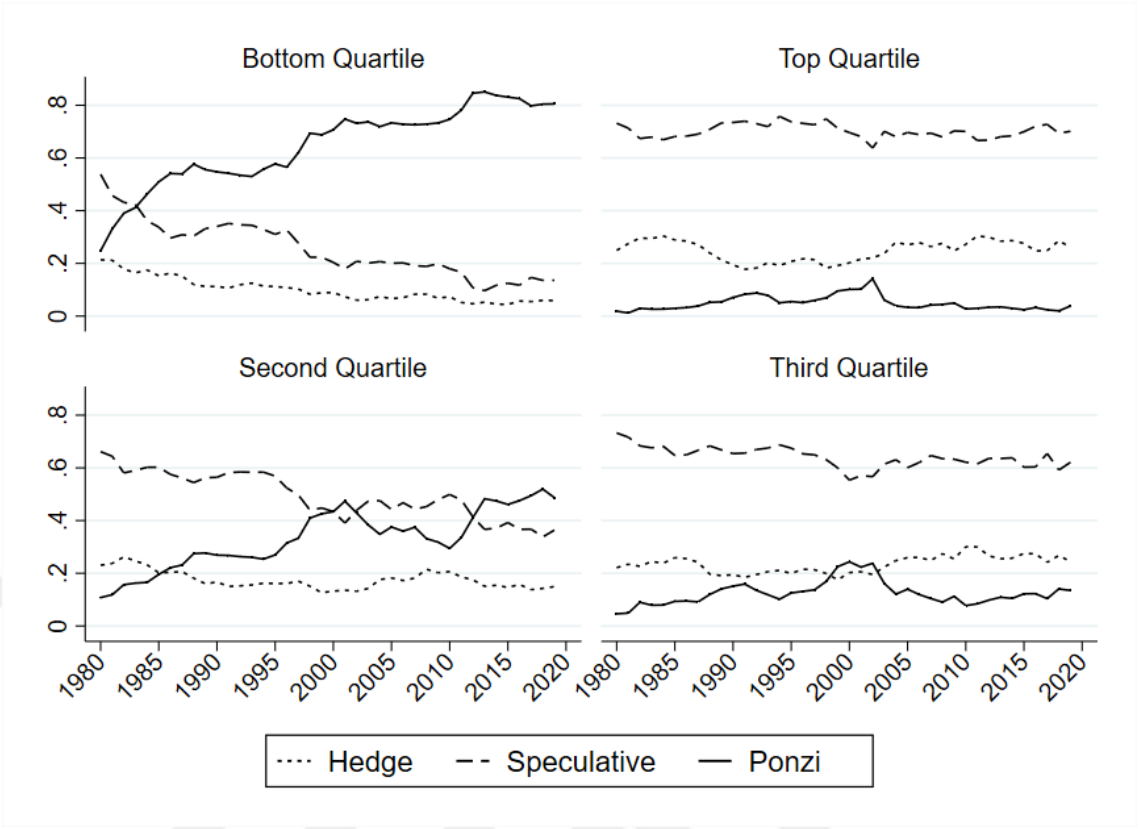

Figure 5.4: Ratio of Firms by Minskian Classifications and Size

Notes: The quartiles are calculated by using yearly total assets.
$\sum$Number of Firms by Minskian Class. $_{(By\ Size,\ t)}$ / $\sum$Number of Firms $_{(By\ Size,\ t)}$
Source: Compustat, author's calculations

Their zombie classification is based on two elements. The ICR should persistently be below the one and an age of at least ten years. Unlike McGowan et al. (2018), I find that in the group of youngest firms (1-10), the share of ponzi firms is bigger than the other firm age groups. The last decade shows that six to ten of all youngest firms are ponzi. Based on calculations, it is seen that there is a linear relationship between firm age and Minskian classification. Even so, there is a positive relationship between firm age and the ratio of speculative firms and the ratio of hedge firms, and a negative relationship between firm age and the ratio of ponzi firms.

The markets have more information on older firms than younger firms. Their existence in markets over the years and transactions between them might be the source of the reliance. Their balance sheets, cash flow and other statements are already ready to audit for the markets. It might be one of the reasons behind the low ponzi rates among them. More information received from older firms turns them low-cost loans and low risk

premium by issuing debt. This will lead them to more capacity to repay their interest burden. Given figure 5.4, this is the pro-arguments of the above statements.

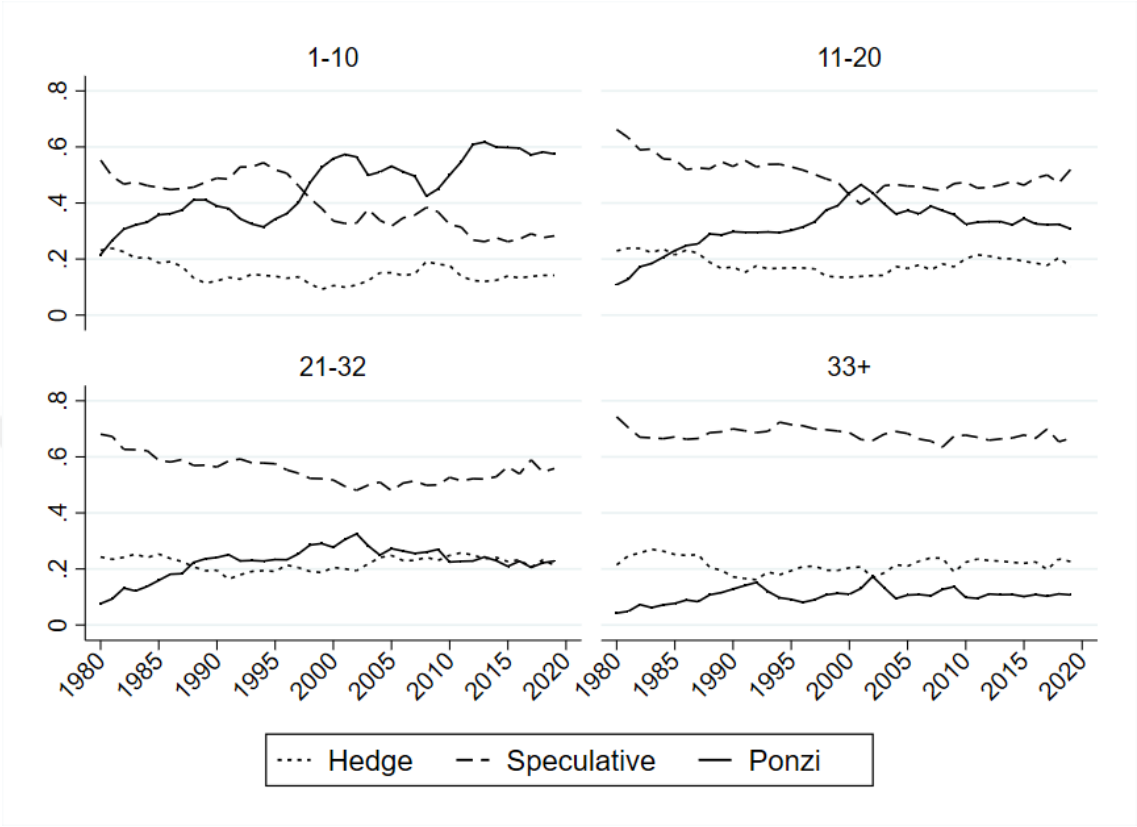

Figure 5.5: Ratio of Firms by Minskian Classifications and Firm Age

Note: ∑Number of Firms by Minskian Class. $_{(By\ Age,\ t)}$ / ∑Number of Firms $_{(By\ Age,\ t)}$
Source: Compustat, author's calculations

Besides information asymmetry between young and old firms, older firms have other privileges. Their competition power, size, unit cost, scale, bargaining power, network, so-called capabilities, might also be related to the firm age. Young firms that enter the market face a lot of problems, as cited above, that old firms may not face. As a result, firms get older, the ratio of ponzi firms decreases and vice versa. Interestingly, the ratio of hedge firms is always a minority for each age group. Except for the youngest group of firms, the ratio of the speculative firms is the dominant group for each age group. In the oldest firms, seven to ten of all firms are speculative. However, the ratio of hedge firms is nearly the same for each group, which is around 20%, and as Minksy said, their fluctuations are small (i.e. robust) in terms of stability.

Figure 5.6 shows the ratio firms by Minskian classification within concentration groups. The concentration groups consist of the 3- and 4- digits levels. The first row displays the 4- digits level and the second row shows the 3-digits level. According to the 4-digits concentration level, the highly concentrated industries are mostly dominated by speculative firms. The ratio of speculative firms in highly concentrated industries resembles a U-shape outlook over the period. First, although there has been a decrease in the ratio of speculative firms in highly concentrated industries from 1980 to 2000, there has been an increase in the ratio of speculative firms in highly concentrated industries from 2000 to 2019. This shift in highly concentrated industries mostly comes from the position changes between speculative and ponzi firms. Second, during the same period, the ratio of ponzi firms in highly concentrated industries resembles an inverse U-shape outlook.

Ponzi firms are mostly concentrated among the mid concentrated industries. The ratio of ponzi firms in mid concentrated industries reached about 45% of total firms in this group in 2019. Concurrently, the share of speculative firms in the same group is about 40% of total firms in this group, and the rest of firms are the hedge firms in mid concentrated industries. Low concentrated industries at the 4-digits level are mostly dominated by speculative firms. While the ratio of speculative firms in low concentrated industries decreases, the ratio of ponzi and hedge firms in this group increase after the 1990s. All in all, according to the 4-digits level, the ratio of ponzi firms has increased in mid concentrated industries from 1980 to 2019. However, the ratio of ponzi firms has remained stable in low concentrated industries and decreased in highly concentrated industries since 2000. Although the ratio of hedge firms in each concentration group remained stable or little changed, the majority of changes have been among the speculative and ponzi firms over the period. In the 3-digits level, there has been a sharp decrease in the ratio of hedge and speculative firms for all concentration groups from 1980 to early 2000s, whereas there has been a sharp increase in the ratio of ponzi firms in each concentration group during the same period. Almost half of the firms in each concentration group were ponzi in the 2000s. However, following years show that there has been a sharp decrease in the ratio of ponzi firms in high and mid concentrated industries. This shift is filled by speculative and hedge firms.

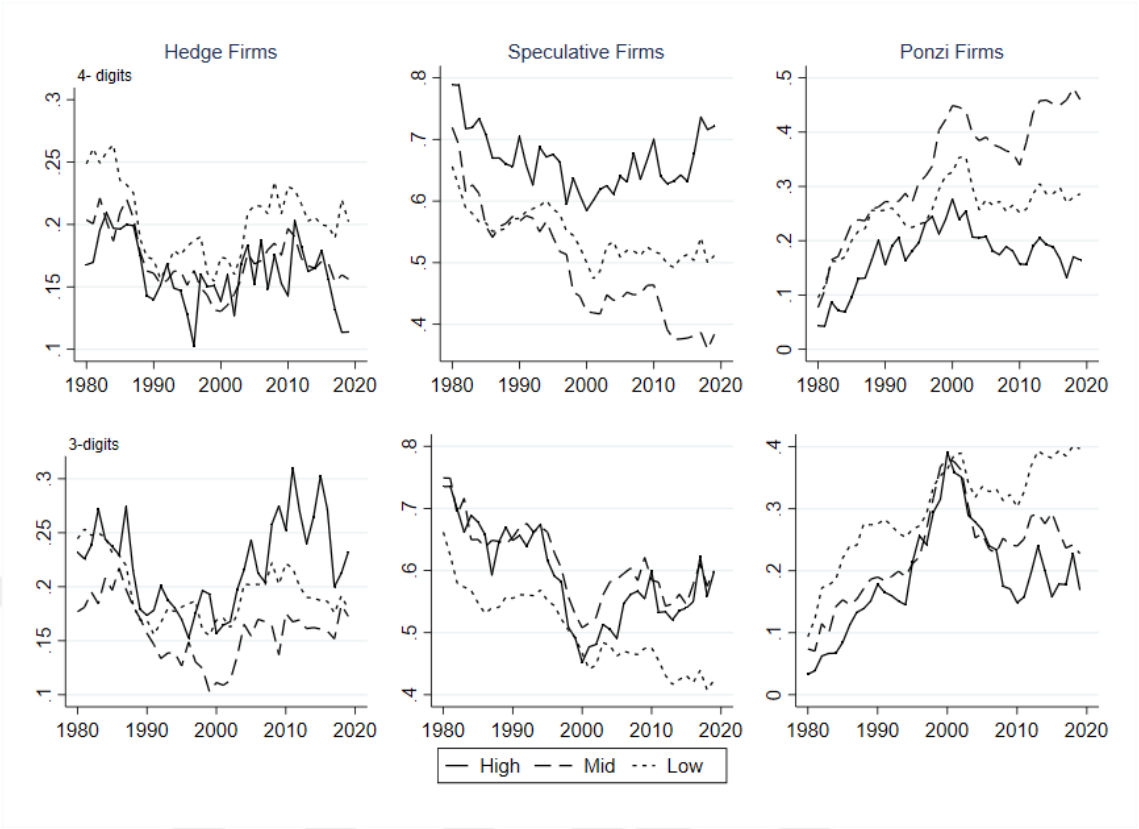

Figure 5.6: Ratio of Firms by Minskian Classifications and Concentration Groups

Note: ∑Number of Firms by Minskian Class. (By Concentration, t) / ∑Number of Firms (By Concentration, t)
Source: Compustat, author's calculations

The ratio of ponzi firms in low concentrated industries remained stable during this period. Almost all concentration groups are dominated by speculative firms. Together with 3-digits and 4-digits level, one might say that there has been a remarkable increase in the ratio of ponzi firms, especially in the mid and low concentrated industries. Nevertheless, the majority of firms are speculative, almost all concentration groups. Despite fluctuations in the ratio of hedge firms, there has been almost no change or small changes in the ratio of hedge firms in each concentration group.

Figure 5.7 describes the ratio of the firms by Minskian classification with respect to industry level. It is clearly seen that the high ratio of ponzi firms is concentrated among the Healthcare sectors. Sectors are based on the Fama-French industry classifications. In Healthcare industry, beginning from the 1990s, the ratio of ponzi firms is the dominant group. Their share has rapidly increased from the 1980s to the 1990s, almost doubled. For a couple of decades in gradual increases, the ratio of ponzi firms has skyrocketed

from about 50% to 70% in the aftermath of the GFC. The last five years have shown that the ratio of ponzi firms in Healthcare industry is stabilized and settled at around the 70% of total firms in Healthcare industry. In the meantime, the ratio of speculative and hedge firms shares the same number of firms in this industry. Given previous figures, it can be said that the Healthcare industry consists of the youngest and smallest firms due to the similarity of ponzi firm ratio.

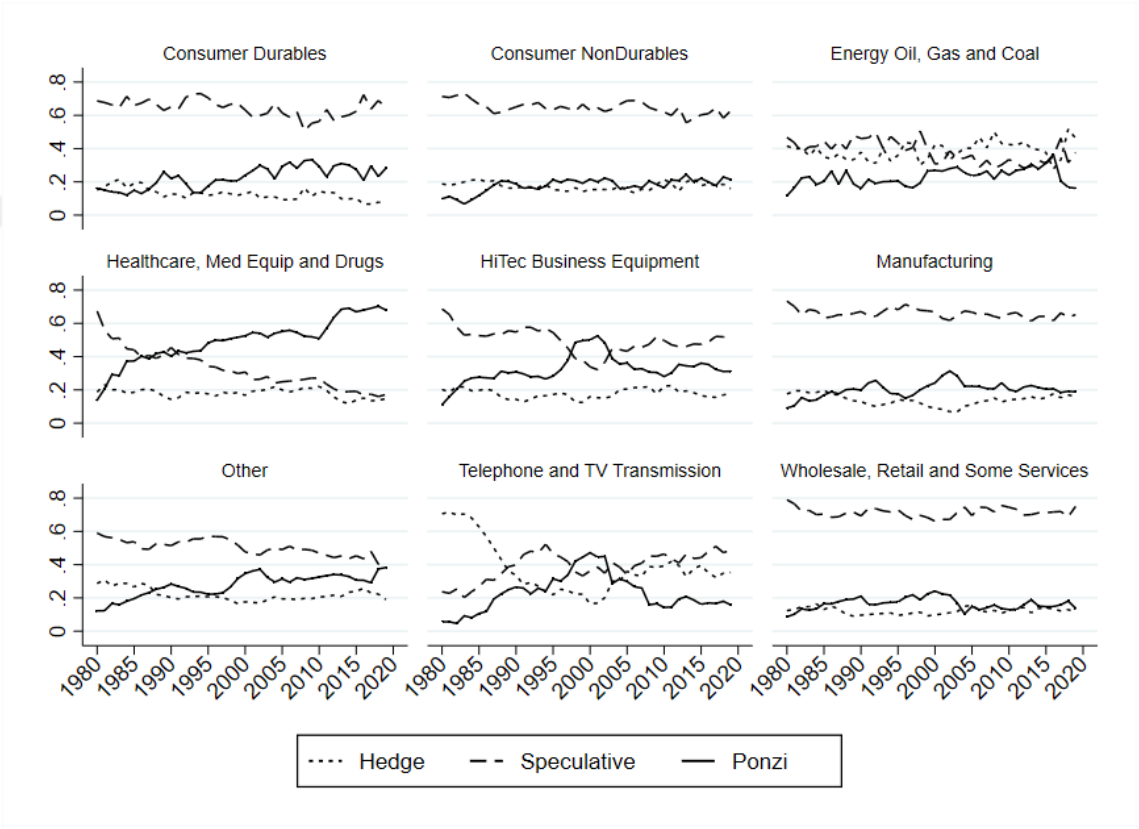

Figure 5.7: Ratio of Firms by Minskian Classifications and Industry

Note: ∑Number of Firms by Minskian Class. (Fama-French Ind Class., t) / ∑Number of Firms (Fama-French Ind Class., t)
Source: Compustat, author's calculations

As known by the previous parts, Healthcare sector is not the most levered industry but the biggest in cash holdings. This meaning that the source of funds of most healthcare industry' firms does not meet their financial obligations. Only 30% of the total firms in Healthcare industry can pay their interest expenses and the rest of the firms cannot. The reason why cash holdings of this industry are so much more than other industries might be the precautionary motive as well (Bates, Kahle and Stulz 2009). Moreover, the cash holdings of ponzi firms nearly three times bigger than the total sample cash holdings. On

the other hand, the ratio of hedge firms in Energy and TV and Transmission industry is way bigger than the total sample ratio. In this manner, one might say that the generating potential systemic risk of these industries is lower than other industries.

In addition to these, by using other control variables such as capital stock, intangibility, concentration groups and profits, the ratio firms by Minskian classification are deeply examined. The findings are as follows. By capital stock, there is a positive relationship between being hedge firms and capital stock, and there is a negative relationship between being ponzi firms and capital stock. Briefly, as the capital stock of firm increases, the ratio of hedge firms increases and the ratio of ponzi firms decreases and vice versa. So to speak, it is seen that the existence of tangible assets is still a safe source in generating income for firms in order to meet their interest obligations. In most tangible firms, which is bigger than the p75 with respect to tangible assets over total assets for each year, the ratio of hedge firms is bigger than the ratio of ponzi firms which is a similar situation like oldest and largest firms. In this group, only 20% of the firms cannot pay their interest repayments by using sources of funds in 2019.

By intangibility, there is a tiny difference between high intangible intensive and less intangible intensive firms in terms of the ratio of hedge firms. For speculative and hedge firms, there is no clear trend or evidence to make a strong statement. In other words, the intangibility of firms is not the best describer to make a link on the ratio of firms by Minskian classifications. The contribution on sources of funds is less than tangible assets. By 4-digits concentration level, as expected, ratio of ponzi firms in highly concentrated industries is lower than the other concentration level. This might be due to low competition level in highly concentrated industries. In high concentrated industries, low competition might guarantee them a stable or certain income and ease to repay their interest burden in many aspects (Additional figures are presented in Appendix A).

Surviving rate of ponzi firms in highly concentrated industries is likely lower than other industries owing to the high interest rate burden and low sources of funds. In contrast, in mid concentrated industries, the share of ponzi firms is the majority of all groups, about 45% in 2019, and in low concentrated industries, the ratio of ponzi firms is non-negligible, which is about 30% of all firms in this group in 2019. As to firms ranked by markup rates,

as expected, the ponzi firms are concentrated among the lowest markup rate group. As profit rate increases, the share of ponzi firms decreases to some point. Interestingly, the ratio of ponzi firms in the top profit rate group is bigger than the other groups, except the lowest profit rate group, since the last decade. Meanwhile, there is a positive and clear relationship between profits and the ratio of hedge firms. The ratio of hedge firms is smallest in the lowest profit rate group and biggest in the highest profit rate group.

5.2 SUMMARY OF THE CHAPTER

This chapter consists of two parts, including a summary of this chapter. The chapter is dedicated to the increasing fragility of U.S. firms. In this part, I benefit from the compustat database covering from 1980 to 2019. My general findings in this chapter as follows.

Despite relatively small debt holdings, the ratio of ponzi firms has reached about %36 of total sample firms. As said above, their debt holdings are relatively small, and the effects on the economy in terms of financial instability might be very limited. Ponzi firms are concentrated among the small firms, and their shares are about 80% of total small firms in 2019. They carry more interest rate burdens than the speculative and hedge firms and cannot meet financial obligations such as interest repayments. Their ICR has reached historically low levels in the last decade, whereas hedge and speculative firms enjoy the recent monetary policy actions. By firm age, the ponzi firms are concentrated among the youngest group, the age between 1-10. Moreover, there is a negative relationship between firm age and being ponzi. The share of ponzi firms is the biggest in the Healthcare industry, and last decade average is about 70% of total Healthcare industry firms.

6. CONCLUSION

The U.S. NFCs, at the aggregate level, are more indebted than before. The increasing amount of debt and leverage ratios have created potential vulnerabilities even before the pandemic shock. The pandemic shock triggers reassessing the accumulated debt of the NFCs in news and papers. In help with firm-level data, I show that the distribution of debt is uneven. Total debt is mostly concentrated among large firms. The large firms thus have higher leverage ratios than small firms. In addition to this, older firms have more levered than younger firms to some point, but this relationship begins to disappear for the last decade. Moreover, the firms with high leverage ratios are concentrated in the Telephone and TV Transmission industry over the period. The last couple of years have shown that the Wholesale and Retail Services industry has rapidly increased its leverage ratios and has been second after Telephone and TV Transmission industry. Last but not least, the firms with low-profit rates have higher leverage ratios than the firms with high profits. However, the relationship between profits and leverage ratios is weaker than before for the last decade.

Capital stock and intangibility play an important role in determining leverage ratios for firms. As capital stock increases, leverage ratios of NFCs increase. I also show the growing importance of intangible assets. Intangibility is the non-negligible determiner for the leverage of NFCs. Intangible intensive firms have more leverage ratios than the less intangible intensive firms. Furthermore, the firms in highly concentrated industries both for three- and four-digits classification have higher leverage than the mid and low concentrated industries. The leverage ratios of the firms in all concentration groups are close to each other in the 1980s. However, the gap between high concentrated and mid and low concentrated industries has become widen in terms of leverage. The last decade has displayed that the leverage ratios of high concentrated industries increased faster than mid and low concentrated industries.

According to calculations I made, in general, the NFCs began to increase their profit rates as of the early 2000s, their markups reached historically high levels in 2019. With the support of the zero-interest-rate policy, NFCs' ratio of interest burden has hit the lowest level, and their ability to repay interest (ICR) has recovered during this period. Despite

low-interest rates and increasing huge amounts of debt, profit rates and markups, the investment rate of the NFCs remained stagnant or decreased. Instead, NFCs accumulate financial assets, hold so much more cash than before, downsize and distribute their sources to shareholders as a form of dividend and stock buybacks and increase the share of intangible assets in their balance sheets. Piling up so much more debt poses a risk on financial stability and while creating potential vulnerabilities and increases fragility.

The ratio of ponzi firms in the firm-level data is about 36% of the total firms. The ponzi firms are concentrated among the small and youngest firms and in Healthcare, Medical Equipment and Drugs industry. Their debt holdings are still very low compared to hedge and speculative firms, approximately 2% of total debt in 2019. Increasing the ratio of ponzi firms might not induce or trigger systemic risk. This is arguable. The ponzi firms face more interest rates than the hedge and speculative firms, and thus their ability to repay interest obligations is harder than hedge and speculative firms. Moving from ponzi to speculative group is more difficult the moving from speculative to ponzi group.

As a result of this study, I argue that the uneven distribution of NFCs' debt leads to unequal accumulation and unequal consequences. Whereas large firms enjoy benefitting abundant and cheaper external sources and increase or sustain their profitability and shareholder payouts without increasing corresponding level of real investment, small firms face a higher cost of external sources leading to decrease its internal funds, deteriorate firms' balance sheets, increase financial fragility and zombification or ponzification. It depresses its profitability and real investment activities. This uneven distribution of debt increases entry barriers to the market and eventually promotes market concentration.

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APPENDIX A

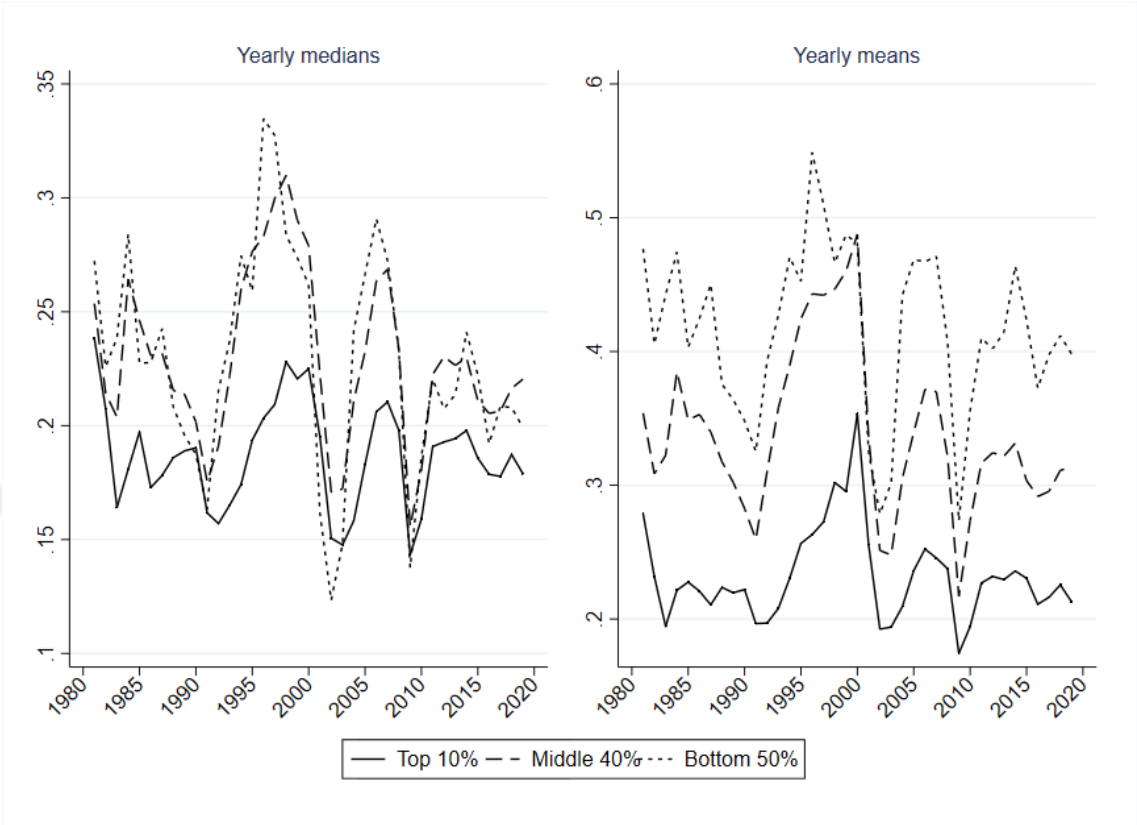

Figure A.1: Rate of Investment by Firm Size

Notes: The mean investment rate is winsorized at 5% for each tail to cope with large outliers.
Source: Compustat, author's calculations

Figure A.2: Rate of Investment by Concentration Groups

Notes: The mean investment rate is winsorized at 5% for each tail to cope with large outliers.
Source: Compustat, author's calculations

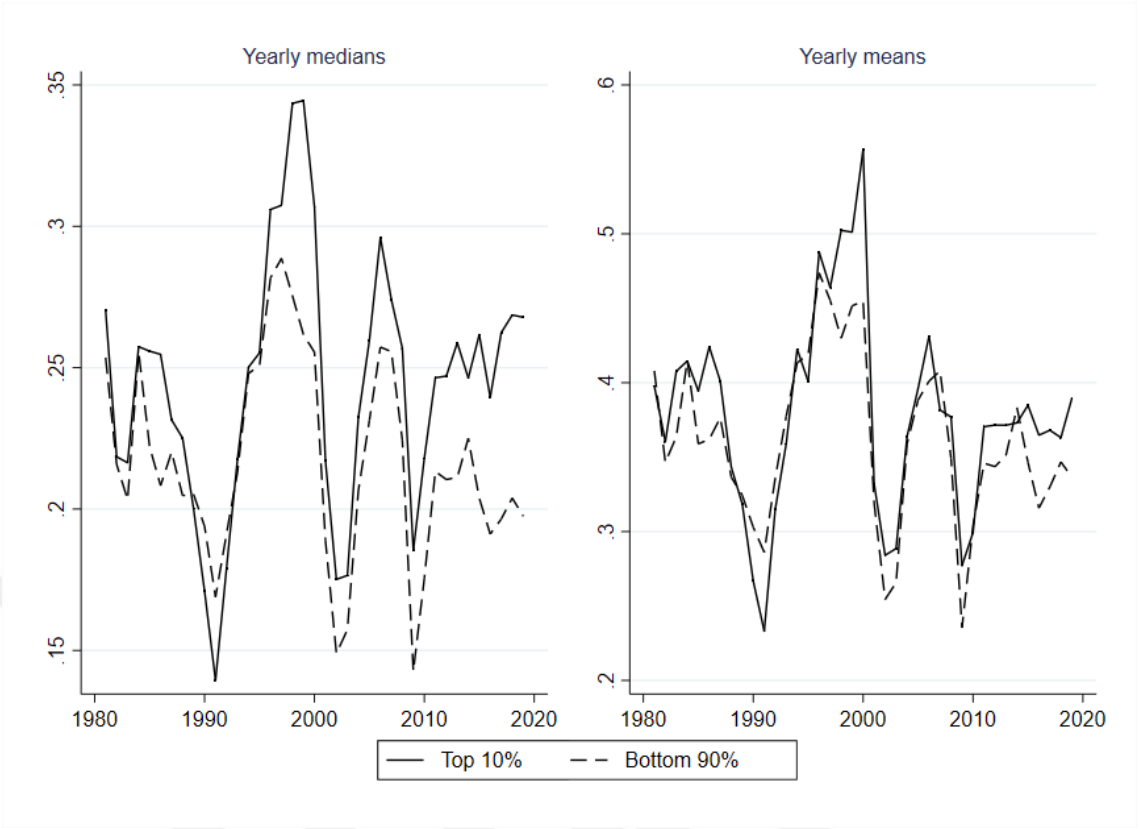

Figure A.3: Rate of Investment by Intangibility

Notes: The mean investment rate is winsorized at 5% for each tail to cope with large outliers.
Source: Compustat, author's calculations

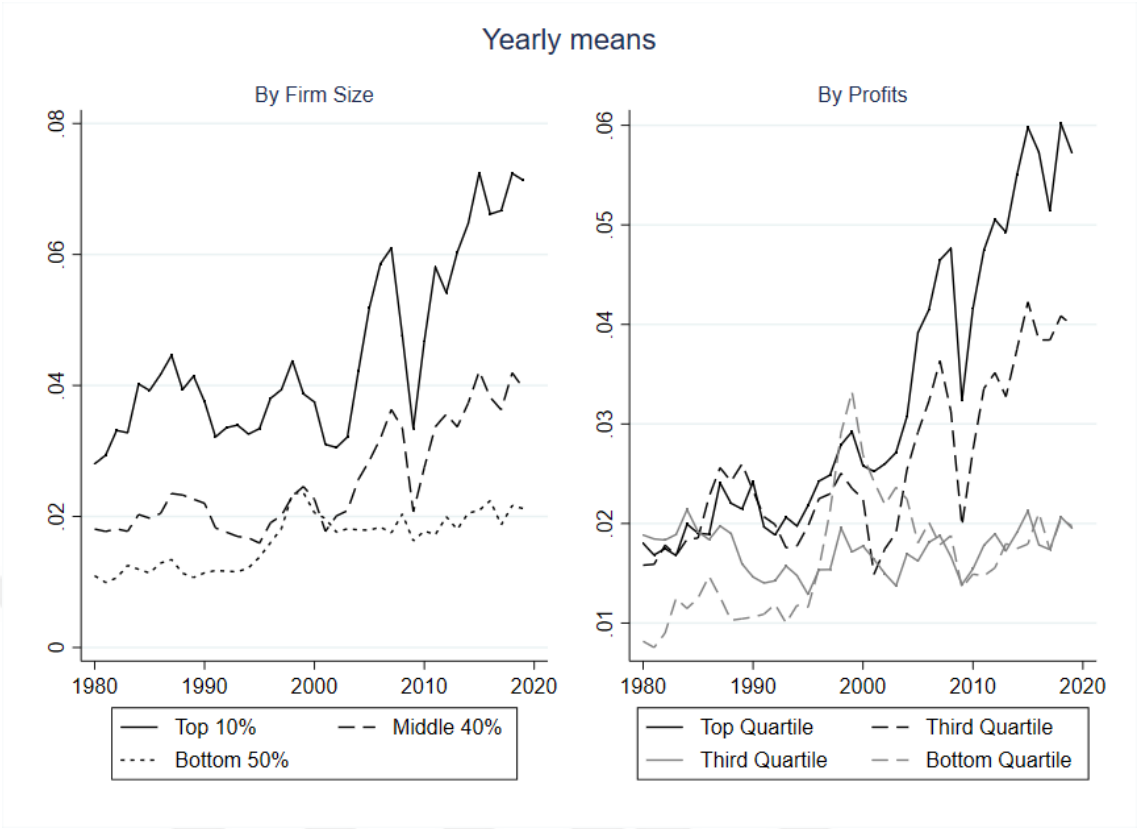

Figure A.4: Shareholder Payouts by Firm Size and Profits

Notes: The mean shareholder payouts is winsorized at 5% for each tail to cope with large outliers.
Source: Compustat, author's calculations

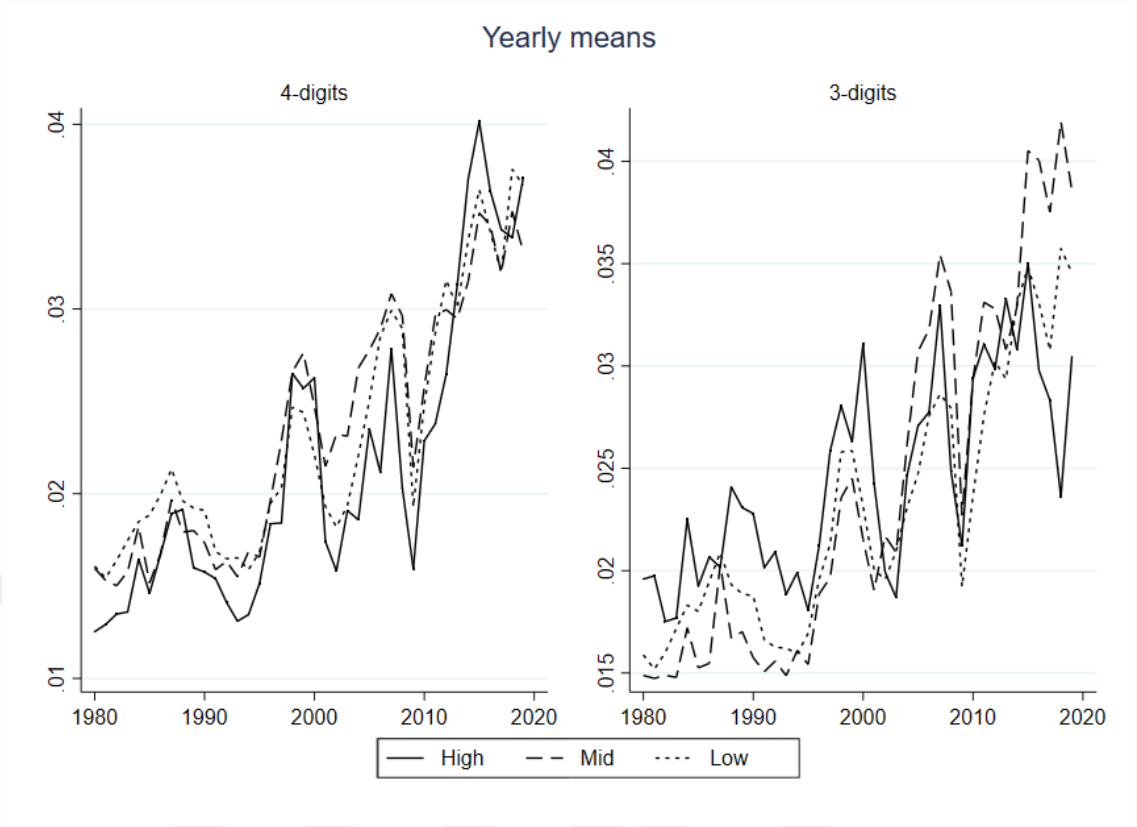

Figure A.5: Shareholder Payouts by Concentration Groups

Notes: The mean shareholder payouts is winsorized at 5% for each tail to cope with large outliers.
Source: Compustat, author's calculations

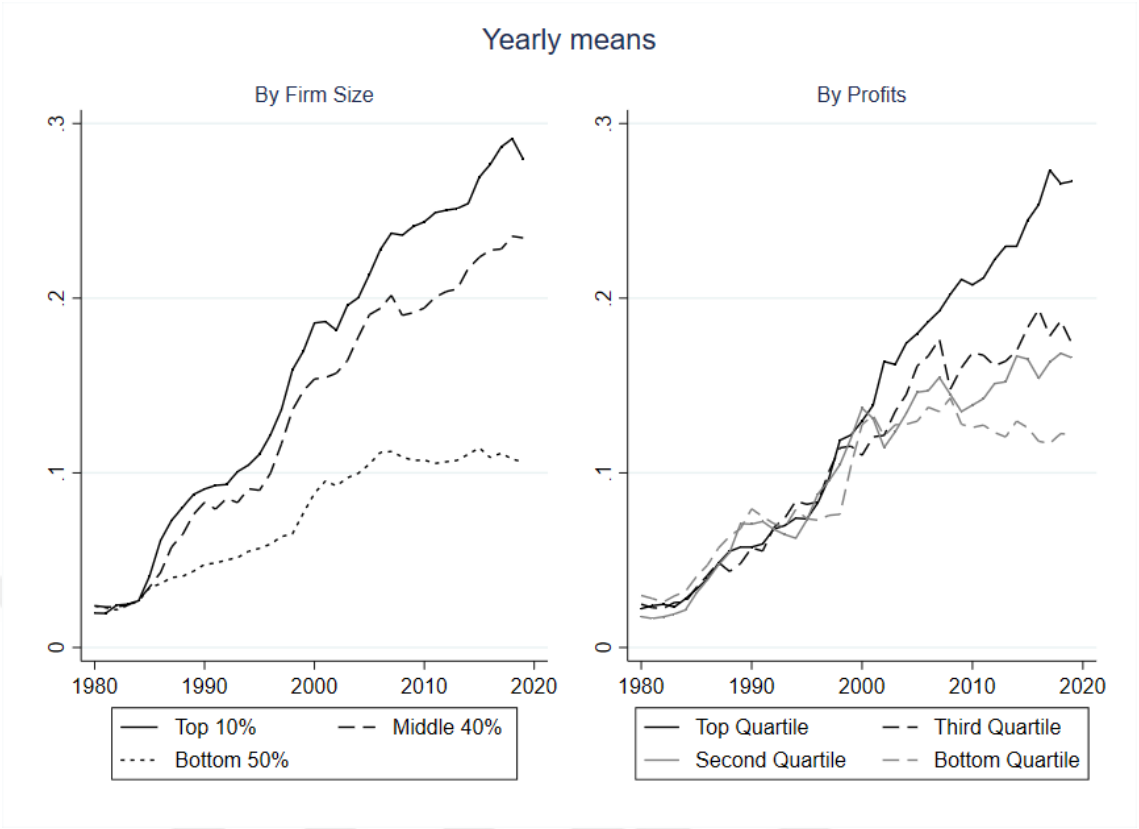

Figure A.6: Intangibility by Firm Size and Profits

Notes: The mean intangibility is winsorized at 5% for each tail to cope with large outliers.
Source: Compustat, author's calculations

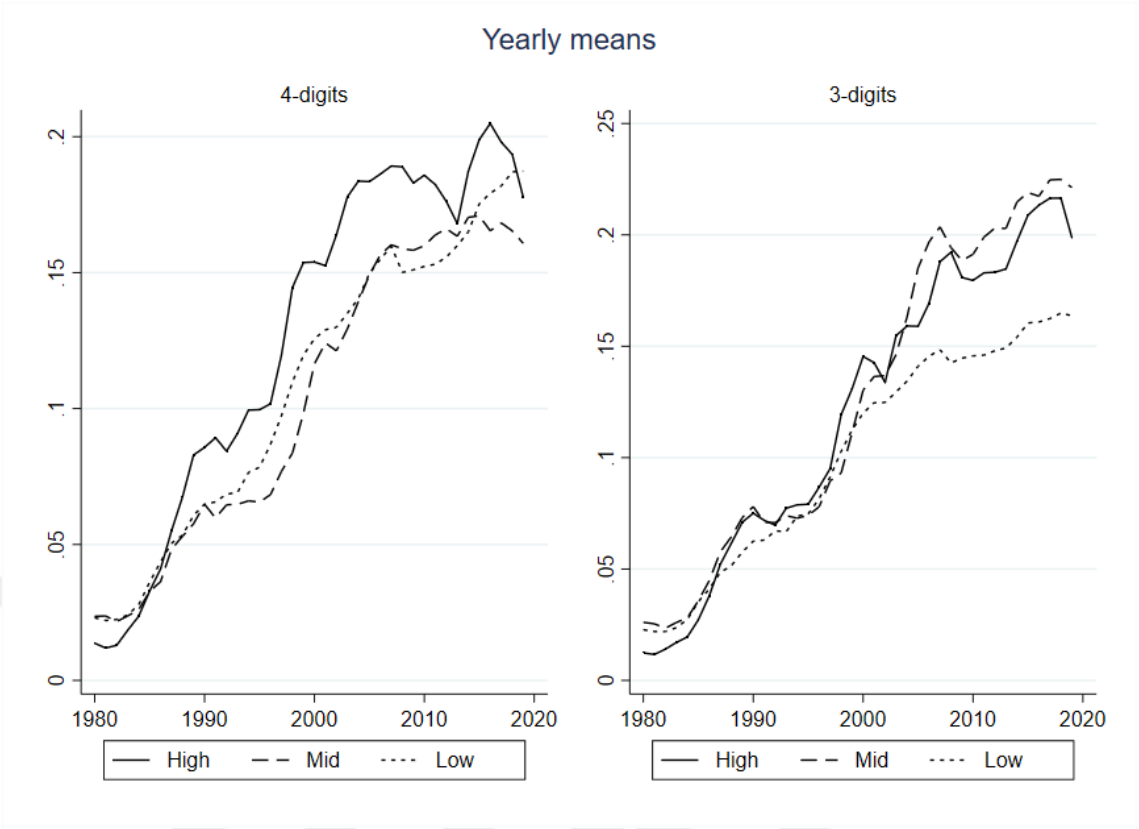

Figure A.7: Intangibility by Concentration Groups

Notes: The mean intangibility is winsorized at 5% for each tail to cope with large outliers.
Source: Compustat, author's calculations

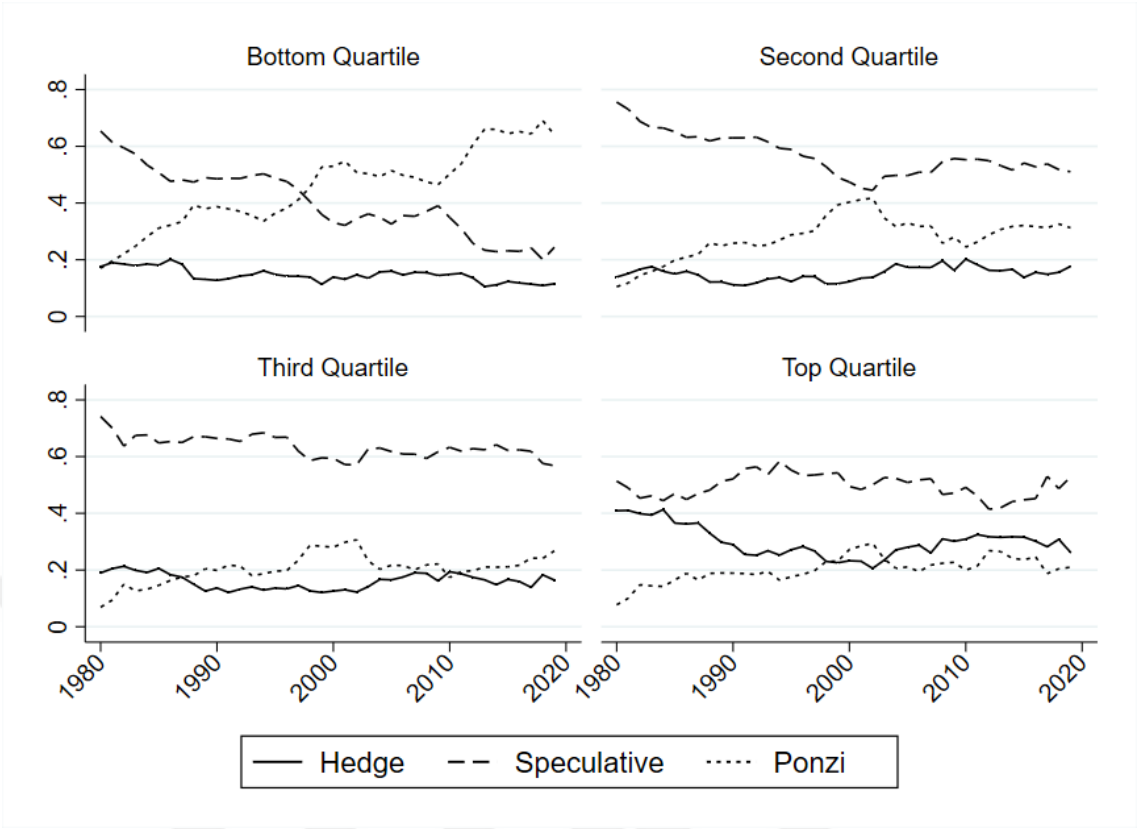

Figure A.8: Ratio of Firm by Minskian Classifications and Capital Stock

Source: Compustat, author's calculations

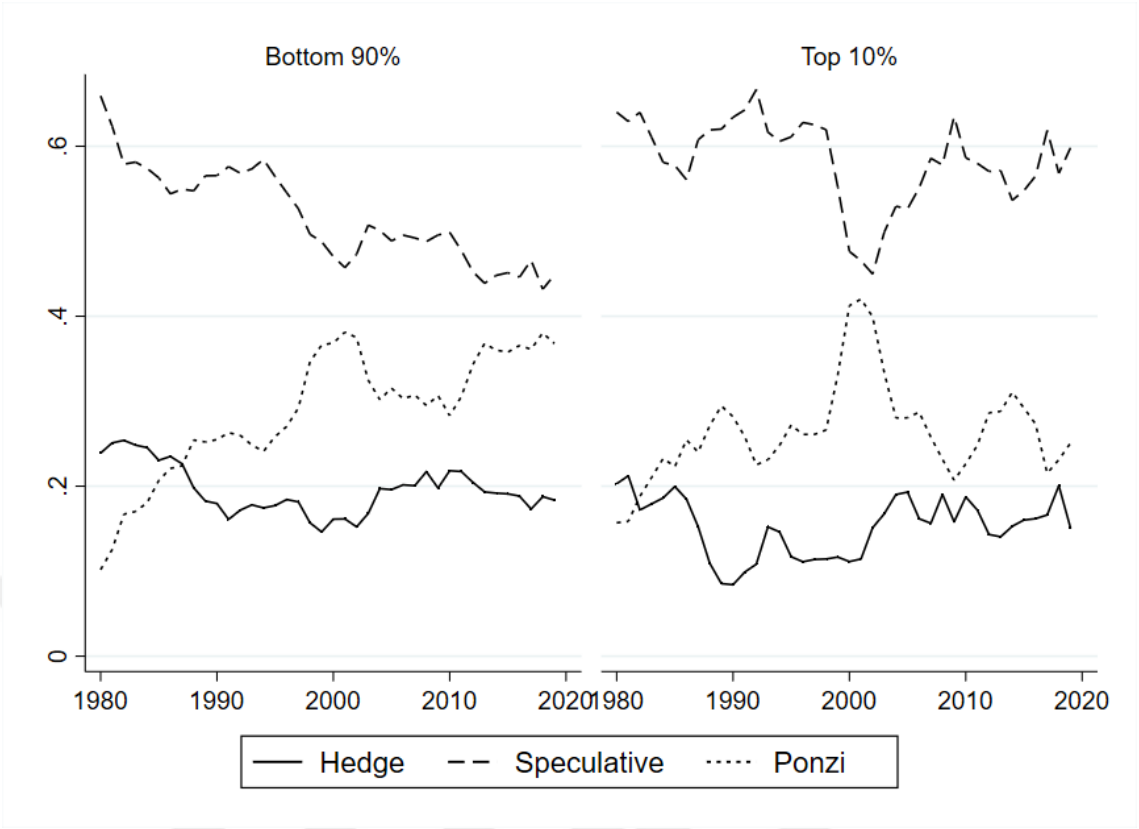

Figure A.9: Ratio of Firms by Minskian Classifications and Intangibility

Source: Compustat, author's calculations

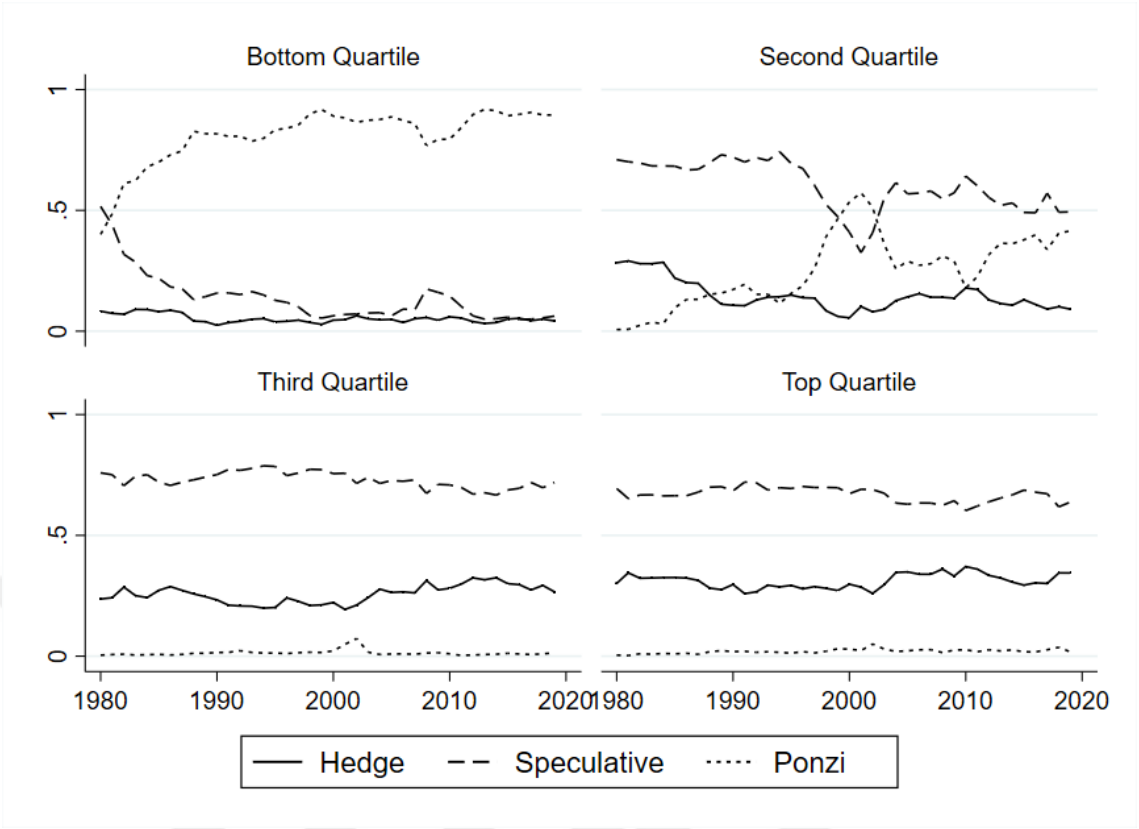

Figure A.10: Ratio of Firms by Minskian Classifications and Profits

Source: Compustat, author's calculations

APPENDIX B

Table B.1: Basic Cashflow of Compustat Firms

Periods	**1980s**	**1990s**	**2000s**	**2010s**
Income Before Extraordinary Items[a]	7.6%	6.1%	4.9%	6.3%
Depreciation and Amortization[b]	5.3%	5.0%	4.3%	4.0%
Deferred Tax[c]	0.6%	0.0%	0.1%	-0.2%
Interest and Related Expense[d]	3.0%	2.6%	1.9%	1.4%
Internal Cash Flow[a+b+c-d]	**10.5%**	**8.5%**	**7.4%**	**8.8%**
Investment[e]	9.0%	7.2%	5.3%	4.8%
Sale of Property, Plant and Equipment[f]	-0.7%	-0.5%	-0.4%	-0.3%
Investing Activities Cash Flow[e+f]	**8.3%**	**6.7%**	**4.9%**	**4.6%**
Shareholder Payout[g]	3.5%	3.2%	3.9%	5.1%
Debt Issuance[h]	1.5%	1.8%	1.3%	1.6%
Financing Activities Cash Flow[g-h]	**2.0%**	**1.4%**	**2.6%**	**3.5%**
Net Change in Cash[(a+b+c-d)-(e+f)-(g-h)]	0.2%	0.5%	0.0%	0.7%
Free Cash	**2.2%**	**1.9%**	**2.6%**	**4.2%**

Notes: [a]Income before extraordinary item is reported net of interest expense; I, therefore, add interest payments back into this income category.
Source: Compustat, author's calculation

Table B.2: Basic Cashflow of Compustat Firms by Firm Size

Periods	**1980s**			**1990s**			**2000s**			**2010s**		
By size	**Bottom 50%**	**Middle 40%**	**Top 10%**	**Bottom 50%**	**Middle 40%**	**Top 10%**	**Bottom 50%**	**Middle 40%**	**Top 10%**	**Bottom 50%**	**Middle 40%**	**Top 10%**
Income Before Extraordinary Items[a]	0.4%	7.2%	7.7%	-7.6%	5.1%	6.4%	-15.9%	3.0%	5.5%	-14.9%	5.1%	6.8%
Depreciation and Amortization[b]	5.0%	4.7%	5.4%	5.3%	4.9%	5.0%	5.3%	4.9%	4.2%	4.0%	4.4%	4.0%
Deferred Tax[c]	0.1%	0.3%	0.6%	-0.1%	-0.1%	0.1%	0.0%	0.1%	0.1%	-0.1%	-0.1%	-0.2%
Interest and Related Expense[d]	3.4%	3.3%	2.9%	2.5%	3.0%	2.5%	2.5%	2.5%	1.8%	2.1%	2.0%	1.3%
Internal Cash Flow[a+b+c-d]	**2.1%**	**8.9%**	**10.8%**	**-4.9%**	**7.0%**	**8.9%**	**-13.2%**	**5.6%**	**8.0%**	**-13.1%**	**7.4%**	**9.3%**
Investment[e]	9.1%	8.3%	9.1%	7.0%	7.4%	7.2%	5.1%	5.7%	5.3%	4.4%	5.2%	4.8%
Sale of Property, Plant and Equipment[f]	-0.1%	-0.1%	-0.1%	-0.4%	-0.3%	-0.4%	-0.5%	-0.3%	-0.3%	-0.3%	-0.2%	-0.2%
Investing Activities Cash Flow[e+f]	**9.0%**	**8.2%**	**9.0%**	**6.6%**	**7.1%**	**6.8%**	**4.6%**	**5.5%**	**5.0%**	**4.1%**	**5.0%**	**4.5%**
Shareholder Payout[g]	1.6%	2.7%	3.7%	2.4%	2.7%	3.3%	2.9%	3.3%	4.0%	2.9%	4.3%	5.3%
Debt Issuance[h]	0.3%	2.0%	1.5%	0.9%	2.7%	1.7%	0.4%	1.4%	1.3%	1.8%	2.4%	1.5%
Financing Activities Cash Flow[g-h]	**1.3%**	**0.7%**	**2.2%**	**1.5%**	**0.0%**	**1.6%**	**2.4%**	**1.9%**	**2.7%**	**1.1%**	**1.9%**	**3.8%**
Net Change in Cash[(a+b+c-d)-(e+f)-(g-h)]	-8.2%	-0.1%	-0.4%	-13.0%	-0.1%	0.5%	-20.2%	-1.8%	0.3%	-18.3%	0.5%	0.9%
Free Cash	**-6.8%**	**0.7%**	**1.8%**	**-11.5%**	**-0.1%**	**2.1%**	**-17.7%**	**0.1%**	**3.0%**	**-17.2%**	**2.4%**	**4.7%**

Notes: [a]Income before extraordinary item is reported net of interest expense; I, therefore, add interest payments back into this income category.
Source: Compustat, author's calculation

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