

The Savings of Corporate Giants*

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Abstract

We construct a novel panel dataset to provide new evidence on how the largest non-financial firms manage their financial assets. Our granular data show that, over the past decade, bond portfolios have grown to be at least as large as cash-like instruments, driven by the meteoric rise of corporate bond holdings. To shed light on the drivers of this growth, we conduct a pair of event studies around the 2017 tax reform and the 2020 liquidity crisis. We find that large holdings of marketable securities are primarily driven by cross-border tax incentives, while cash-like instruments are driven by liquidity motives.

Keywords: superstar firms, corporate cash, corporate bonds, repatriation tax, liquidity management

JEL codes: G32, G35, G11, E440

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1 Introduction

The world economy is increasingly shaped by firms at the top of the size distribution. The scale and the global nature of their activities have led many observers to question whether they operate like other firms and to examine implications for labor and product markets.¹ In this paper, we ask: How do these large nonfinancial corporations manage their financial arm? What does financial management reveal about their operations?

It is well known that the financial assets of non-financial firms are large. An issue that is often overlooked is that these are portfolios of assets rather than plain cash. Apple stands as a remarkable illustration. As 2017, it owned \$260 billion in financial assets, from which \$150 billion were corporate bonds and \$55 billion US Treasury bonds. This means that Apple is one of the largest investors in corporate bonds in the world and, in total size, surpasses the combined financial assets of the sixth- and seventh-largest banks in the United States, namely PNC and Bancorp, respectively. While extensive work has studied why companies accumulate liquid assets, less is known about how firms choose their portfolio allocation and how it relates to common explanations, such as precautionary motives (e.g. (Almeida et al., 2014; Begenau and Palazzo, 2021)) and tax incentives (e.g. Foley et al. (2007); Faulkender et al. (2019)).

This paper sheds new light on this question by providing new data and new facts. Our main contribution is that we construct a novel panel dataset on the *composition* of corporate financial assets and their *dynamics* over the past twenty years. The panel nature of our data enables us to uncover two sets of facts. First, we unveil the true nature of trends in financial asset accumulation ("the corporate savings glut"), and in particular, the meteoric rise of corporate bond holdings issued by other firms, not cash-like instruments.² Second, we

¹A growing body of literature in economics examines the role of "superstar firms" or "mega-firms" in many important areas, including business cycles (Gabaix, 2011; Crouzet et al., 2017), market power (De Loecker et al., 2020; Liu et al., 2019), investment (Gutiérrez and Philippon, 2017), inequality (Song et al., 2019; Gomez and Gouin-Bonenfant, 2020), growth (Aghion et al., 2019), and labor and capital shares (Autor et al., 2020; Hartman-Glaser et al., 2019).

²Note that the terminology "savings" has been used to denote a flow measure (Chen et al., 2017), but also occasionally the stock of savings accumulated through cash or other financial assets. Our data are on the latter, and the paper uses the terminology of "financial assets" to avoid any ambiguity.

shed light on the underlying mechanism behind these trends by conducting two event studies around the 2017 tax reform and the liquidity crisis following the 2020 COVID-19 outbreak. This evidence can inform the debate on the driver of the "cash" of corporate giants: holdings of marketable securities like corporate bonds are large and primarily driven by cross-border tax incentives. Holdings of cash-like instruments are smaller and primarily driven by liquidity motives. Our hand-collected data are publicly available at www.fanfrepo.com.

Our panel is constructed by manually collecting data from annual reports, following the approach of Duchin et al. (2017). Conceptually, we want our measure of financial assets to include both cash-like instruments as well as marketable securities held by a firm. Conventional data sources, such as Compustat, do not accurately separate cash from marketable securities. In the case of Compustat, the share of financial assets reported in noncurrent assets is not recorded at all. The footnotes of 10-K annual reports, however, include details on the firms' holdings of major asset classes, ranging from cash and money market funds to various types of bonds and equities. Almeida et al. (2014) provide an early example of the case of Apple. We build a sample of large U.S. public firms' holdings by collecting these data from 2000 to 2021 for two hundred firms, covering a variety of sectors and time periods.

Our first key finding is that marketable securities, not cash, are responsible for the majority of the growth in aggregate financial assets, which peaked in 2017. Since 2007, total financial assets have grown by \$1 trillion in our sample. Cash-like instruments grew by only \$350 billion, or only a third of total growth.³ In fact, in recent years, bond portfolios have been at least as large as cash balances. Figure 1 shows the composition of financial assets in 2017. Bonds represent 45% of financial assets in 2017, while cash-like instruments account for 44%, a five percentage point decrease since 2000. In particular, we document the meteoric rise of corporate bonds in the aggregate portfolio. They have outgrown U.S. Treasuries and agency securities, whose share has been stable since 2012 at 21%.

³In our baseline classification, we define cash-like instruments as the sum of cash, money market funds, deposits, and commercial paper, when reported. When no detailed breakdown is reported, we conservatively label all "cash and cash equivalents" as cash-like.

To better understand the drivers of this growth, we present two recent event studies. First, we document a sharp reversal and portfolio shift following the 2017 repatriation tax reform. Recent works have argued that tax incentives drive the growth in "cash" holdings: multinationals shift earnings abroad and hold them in financial assets instead of distributing them to avoid paying U.S. taxes.⁴ The Tax Cuts and Jobs Act (TCJA) aimed to reduce tax incentives for keeping "cash" abroad starting in 2018. Between 2017 and 2019, total financial assets dropped by \$400 billion: a third of the previous ten years' growth disappeared in just two years. Moreover, we observe a drastic portfolio shift post reform: firms liquidated bond portfolios, especially corporate bonds, rather than cash balances. About three-quarters of this drop was redistributed to shareholders in the form of increased share repurchases and thus left corporate balance sheets. We interpret these results as evidence that tax incentives cause firms to shift their portfolio to riskier securities, potentially with higher yields, like bonds.

Second, we examine firms' responses to the liquidity crisis triggered by the outbreak of COVID-19 in early 2020. The prospect of declining revenues lead to a "corporate dash for cash" to build precautionary liquidity buffers. Observing firms' active management of their financial portfolios in this period is particularly interesting because it reveals which assets are deemed most appropriate for liquidity management. Our micro-data show a dramatic shift toward cash-like instruments. We observe, however, no increase in corporate bond holdings, in line with them becoming extremely illiquid in this period (Haddad et al., 2020; Kargar et al., 2020).

Finally, the rise of marketable securities can potentially expose the U.S. corporate sector to new risks. A clear example is duration risk: when interest rates increase, as they did massively in 2022, the value of bonds falls. While the negative effects on financial institutions have been widely discussed, we collected additional data to show that corporate giants have also been affected: they experienced historically large losses on their financial assets portfolios.

This evidence can help shed light on the debate on whether the "cash" of corporate giants is

⁴See for instance Foley et al. (2007); Hanlon et al. (2015); Harford et al. (2017); Faulkender et al. (2019); De Simone et al. (2019).

driven by cross-border tax incentives or liquidity motives. By observing changes in portfolio composition, the panel structure of our data uncovers that different financial assets play different roles, with different economic magnitudes. Holdings of marketable securities are large and primarily driven by cross-border tax incentives. Cash-like instruments, driven by liquidity motives, grew at a slower rate until the 2020 crisis. More generally, our data can also help us better understand the role played by corporate giants in explaining macroeconomics trends.

Related Literature Our data represent the first large panel dataset of its kind that has been made widely available. The survey of Almeida et al. (2014) provides an early discussion of measurement issues in corporate financial assets, using Apple as an example. Our approach is to collect granular data on firms' financial assets building on the method first presented in Duchin et al. (2017). We extend their approach to obtain a panel that spans from 2000 to 2021, allowing the study of both the aggregate growth and the latest reversal, as well as changes in the composition of financial assets held by firms. Thanks to these new data, we contribute to a growing literature on firms' financial assets holdings (Chen and Duchin, 2019; Ferreira, 2021; Huang and Sacchetto, 2022).

This paper also relates to the classical literature on corporate cash holdings. Although a large body of work has documented the rise in cash holdings, there is still considerable debate concerning its drivers, which may be liquidity motives and financial frictions, intangibles, skilled labor, interest rates, or taxes.⁵ We argue that the composition of financial assets portfolios and their dynamics can help shed light on the motives behind these trends. For instance, Duchin et al. (2017) emphasize that risky assets are held by poorly governed firms and are discounted by the stock market relative to safe assets. On the other hand, other papers have argued that timing tax holidays can generate value for multinational firms.⁶ We connect

⁵See for instance Bates et al. (2009), Graham and Leary (2018), Chen et al. (2017), Eisfeldt (2017), Almeida et al. (2004), Denis and Sibilkov (2010), Harris and Raviv (2017), Cunha and Pollet (2015), Eisfeldt and Muir (2016), Bolton et al. (2011), Falato et al. (2022), Döttling et al. (2018), Azar et al. (2016), Gao et al. (2018), Foley et al. (2007), Pinkowitz et al. (2016), Faulkender et al. (2019), and De Simone et al. (2019).

⁶See for example Faulkender et al. (2019) or Albertus et al. (2022) among many others. Note also that

these two pieces of evidence by showing large sensitivity of marketable securities holdings to the 2017 tax reform, which is evidence that firms choose to hold riskier securities due to tax incentives, a strategy that could potentially enhance the value of the firm.

Our results also relate to [Begenau and Palazzo \(2021\)](#) who study the role of selection effects behind the aggregate cash increase. They estimate that 50% in the secular increase in "cash" holdings is driven by the precautionary savings motive of small and R&D intensive firms. Our work shows the other side of the picture, focusing on the role of large and likely financially unconstrained firms in the increase of financial assets accumulation.

Our paper relates to the behavior of the largest corporations, sometimes referred as "superstar firms" or "mega-firms." We focus on their financial arms and show that these firms are key players not only in labor and product markets but also in financial markets. Our data help to paint a granular picture of the corporate savings glut by focusing on the largest firms, an approach that is gaining ground in macroeconomics. For instance, [Chen et al. \(2017\)](#) document that the rise of corporate savings is a global and pervasive phenomenon, we focus on the very largest U.S. firms to understand the nature in terms of portfolio composition of the increase in corporate savings. The concentration of financial assets in sectors like tech and pharma relates to [Li \(2019\)](#), who provides a theory of the macroeconomic causes and consequences of the enormous amount of liquid assets held by intangible-intensive firms.

The composition of corporate financial assets also has implications for the macroeconomic consequences of inequality. [Mian et al. \(2020\)](#) provide evidence of a "saving glut of the rich" working mostly through financial asset accumulation, including equity holdings of businesses, which in turn hold claims on the noncorporate sector. Moreover, multinational taxation has become a central issue for policymakers worldwide and our new data on the financial side of corporate balance sheets can help complement existing work on income and profits.⁷

[Duchin et al. \(2017\)](#) explicitly discusses tax effects on financial assets composition in their Appendix C.

⁷For instance, while [Garcia-Bernardo et al. \(2020\)](#) find that the TCJA did not alter the location of firms' profits, we show that it led firms to liquidate bond portfolios to increase shareholders' payouts. Other works on multinational taxation and multinationals include [Erel et al. \(2020\)](#), [Garcia-Bernardo and Janský \(2022\)](#), [Fernandes and Gonenc \(2016\)](#), [Beyer et al. \(2021\)](#), [Albertus et al. \(2022\)](#), [Borochin et al. \(2021\)](#), and [Olson \(2019\)](#).

2 Data Construction

Understanding the composition of firms' financial assets using conventional data sources such as Compustat is difficult. These data are based on common balance sheet items such as "cash and cash equivalents" and "short-term investments." There are two related issues: (i) firms' holdings of financial assets are sometimes hidden in more opaque sections of the balance sheet such as "other assets," and (ii) balance sheet data do not accurately separate cash from marketable securities and do not breakdown firms' holdings by asset classes. Apple is a striking example: In 2017 Compustat "cash" underestimates the size of the firm's actual financial assets by \$190 billion. Detailed micro-data are important to understand how large nonfinancial corporations manage their financial arms.

To this end, we build a panel by manually collecting data from annual reports. The footnotes of 10-K annual reports include details on the firms' holdings of major asset classes. Regulations have required that companies disclose their financial assets since 2009. This change was first exploited by Duchin et al. (2017). Statement of Financial Accounting Standards No. 157 requires all U.S. public firms to report the "fair value" of financial instruments on their balance sheet. We can thus observe the outstanding amounts of different types of financial assets held by firms over time. Although the exact labeling of asset classes varies across firms and time, we can often directly see a rather detailed breakdown, ranging from cash and money market funds to various types of bonds and equities.

Figure 2 illustrates an example of such a financial instrument table for Apple in 2017. The "Fair Value" column captures the best estimates of the market value of positions for different types of financial assets. In this example, the categories are easy to parse, including "cash," "money market funds," "U.S. Treasuries," and "Corporate securities." We see that Apple holds a large amount of financial assets, as much as \$268 billion, across many different types of assets. This amount is much larger than the \$75 billion in "cash and short-term investments" reported on its balance and recorded in Compustat.

For clarity of exposition, it is often convenient to try to distinguish cash-like instruments

from marketable securities, although the line is admittedly not easy to draw. In our baseline classification, we define cash-like instruments as the sum of cash, money market funds, deposits, and commercial paper, if this information is reported; and "cash and cash equivalents" otherwise. To keep the exposition simple, we label the rest of financial assets as "marketable securities."⁸ According to this classification, Apple's cash-like instruments amount to \$24 billion, or less than 10% of its total financial assets. In any case, we always keep track of each component separately.

Although this micro-data gives unprecedented insight into firms' financial asset portfolios, there are some limitations. Specifically, only the disclosure of outstanding values is mandated and thus systematically reported. There is virtually no security-level data such as risk, maturity, or yield that are reported consistently.⁹ We also collect data preceding the 2009 reform and, although many firms voluntarily disclose information on their financial assets, the data are significantly less detailed in these earlier years.

Our sample is based on data collected for from 2000 to 2021 for two hundred large firms.¹⁰ To mitigate composition bias, we select the hundred largest firms in Compustat in terms of total assets in 2017, 2009, and 2000. The union gives us 166 firms. We complete the list by adding an extra 44 firms with the largest total assets in 2017 that were not covered previously. We only consider firms that are publicly traded in one of the three main U.S. stock exchanges (NYSE, Nasdaq, and Amex). Table A.3 in the Internet Appendix lists all the firms in our sample. We exclude regulated utilities (Standard Industrial Classification codes 4900–4999), financial firms (6000–6999), and firms categorized as public service, international affairs, or nonoperating establishments (9000+). Following Duchin et al. (2017), we do not consider restricted assets, pension assets, deferred executive compensation, and derivatives as

⁸Because our focus is not on risk-taking per se, this classification is slightly different from Duchin et al. (2017): our "cash-like instruments" do not include U.S. government securities, whereas their "safe assets" include them. We do not think that represents any contradiction, as Treasuries are safe marketable securities that represent an interesting middle ground between money market instruments and corporate bonds or equities, and are potentially used differently by different firms.

⁹Since 2009, firms must disclose the share of Level 1, Level 2, and Level 3 assets. However, this classification is based on the existence of a market price, rather than the underlying risk or return.

¹⁰To zoom in the COVID-19 crises, for the year 2020 we collected quarterly data.

part of our baseline measure of financial assets. In recent years, firms in our sample capture around 39% of aggregate "cash and short-term investments" in the universe of publicly traded companies in Compustat. In earlier years, this share is smaller, from 38% in 2010 to 33% in 2002. Note finally that the vast majority of our sample consists of multinationals, in the sense that they report nontrivial foreign earnings.

Our data provide information beyond the CH and CHE aggregate of Compustat in 67% of the firm-year observations. In the years after 2009, after the disclosure requirements changed, 72% of firm-year observations contain some information about the composition of the financial portfolio of firms, compared to 60% before 2009. When we cannot find information beyond the aggregate, we report total cash and cash equivalents as cash-like and the total cash, cash equivalents, and marketable securities as total financial assets. Information on the breakdown of cash and cash equivalents is only available for 31% of firm-year observations.¹¹

All of the hand-collected data are publicly available in the following repository: www.fanfrepo.com.

3 The Growth in Financial Assets of Corporate Giants

3.1 Large Aggregate Growth until 2017

Figure 3 displays the growth in financial assets in our sample. The fast growth is in line with existing evidence on aggregate "cash" holdings and the rise in corporate savings (Chen et al., 2017). Aggregate financial assets stand at \$1.7T in 2017, compared to \$1.1T in 2012 and \$640B in 2004. (There is a noticeable reversal in 2018 following the tax reform. We explore this issue in detail in Section 4.1.) The growth is even larger than what conventional databases would suggest, as financial assets are consistently larger than "cash and short-term

¹¹Due to the likely selection of firms that actually report the breakdown of cash-like instruments, we avoid drawing conclusions about the cash-like portfolio composition of firms. In the cases in which there is no breakdown for this category, we conservatively assign the cash and cash equivalents as cash-like instruments. Our measure of cash-like instruments thus tracks the Compustat variable CH closely for most firms.

investment" as reported in Compustat ("CHE" variable). In 2012, CHE accounted for only 84% of financial assets, a ratio that dropped to 79% in 2015.

On a similar note, the first striking finding is that marketable securities are responsible for the majority of the growth in aggregate financial assets. Since 2007, total financial assets have grown by \$1T in our sample. Cash-like instruments grew by \$360B, or only a third of total growth. Moreover, Panel (b) of Figure 3 shows that financial asset growth has been faster than firm growth: the aggregate financial assets to assets ratio rose from 12% in 2004 to 16% in 2017.¹² Figure A.1 in the Internet Appendix illustrates this pattern for four of the largest holders of financial assets: Apple, Microsoft, Alphabet, and Amgen. In all cases, it is clear that the growth in cash-like instruments has been strikingly small compared to the explosive growth in marketable securities.

A last important observation is that this aggregate growth is largely driven by a composition effect, namely the rise of "pharma" and "tech" (broadly defined, see Table A.3 for a list) as dominating sectors in the past fifteen years. Indeed, Figure 4 shows that firms in these sectors always had a significantly larger ratio of financial assets over assets relative to other sectors. The magnitude of these differences is strikingly large: "tech" and "pharma" financial assets consistently represent over 20% and 30% of their book assets, respectively, whereas this ratio is below 10% for other sectors. Moreover, firms in these sectors have been growing at a significantly higher rate than the rest of the economy. Therefore, most of the aggregate growth comes from firms with more financial assets growing faster, as opposed to firms accumulating increasingly more financial assets relative to their size.¹³ This composition effect is related to some of the evidence of Begenau and Palazzo (2021) and Gu (2017). Interestingly, these sectors are also the ones that have the largest physical "investment gap" (Crouzet and Eberly, 2020), suggesting a potential connection between real and financial investment decisions.

¹²The growth over the past two decades is also apparent when scaling by other measures of firm size to better account for market valuations.

¹³A similar pattern holds if one uses enterprise value as a proxy for size instead of book assets to better account for market values.

3.2 The Rise of (Corporate) Bonds

Our micro-data allow us to delve deeper into the composition of financial assets. Strikingly, in recent years, bond portfolios are at least as large as cash balances. Table 1 shows that when U.S. government debt and corporate bonds are added, they represent 45% of financial assets in 2017, whereas cash-like instruments account for 44%. In 2012, the proportions were inverted, with 33% in bonds versus 50% in cash-like instruments. The share of cash-like instruments to financial assets has fallen five percentage points between 2000 and 2017.

Moreover, we document the meteoric rise of corporate bonds in the aggregate portfolio. Corporate bond holdings have almost tripled in value between 2012 and 2017 to reach \$400 billion. They constitute almost 25% of aggregate financial assets, which makes them the single largest asset class, according to our classification. In particular, they have outgrown U.S. Treasuries and agencies whose share has been stable since 2012 at around 20%.

This is surprising, as these bonds are issued by other corporations. In contrast with the textbook view that assumes firms only demand credit through borrowing, our data show that nonfinancial firms significantly contribute to the credit supply. Indeed, Apple was a net lender to the corporate sector during our sample period due to its massive holdings of corporate bonds and low debt levels. Until very recently, Apple had been lending as much as \$60 billion in net, while Alphabet has become the largest net lender at about \$20 billion.¹⁴

Interestingly, our data paints a very different picture from what is reported in the U.S. Financial Accounts (previously named Flow of Funds). A key difference is that our consolidated firm-level data captures the full holdings of financial assets of large multinational corporations, while the Financial Accounts typically excludes foreign affiliates and only reports holdings of domestic entities. For example, the 2017Q4 Financial Accounts Table L.102 vastly underestimates firms' holdings of bonds relative to the figures in Table 1. Total debt securities (excluding commercial paper) are as low as \$113B, broken down between Treasuries, Agen-

¹⁴Our definition of net lending is based on stocks of financial assets and financial debt. The amount of net lending by the corporate sector is larger if one uses a definition based on flows (Chen et al., 2017).

cies, and MBS. Corporate bonds are not listed at all. In our sample, Treasuries amounted to \$350B and corporate bonds to \$396B at this point. Moreover, the Financial Accounts does not display the same dramatic growth in debt securities over our sample period. These differences in both levels and trends in financial assets accumulation are consistent with the evidence that the majority of financial assets are held by foreign subsidiaries and thus excluded from the U.S. Financial Accounts, in line with Faulkender et al. (2019).¹⁵

Finally, somewhat unsurprisingly, financial asset holdings are largely concentrated. Figure A.3 in the Internet Appendix plots the aggregate share of the ten, twenty, and thirty largest firms over time. For reference, Table A.1 presents the twenty largest holders of financial assets as of 2017, which is very similar to the ranking in Duchin et al. (2017) who used data from earlier years. It is clear that the firms at the top hold a disproportionate fraction of the total and that they are responsible for almost all of the aggregate growth. For instance, in 2017, the top ten firms held over half of the total, and the top twenty held 76%. The concentration is even more pronounced when looking at marketable securities separately from cash-like instruments. For instance, in 2017, the top ten firms held over 70% of the aggregate, and Apple on its own held 40% of total corporate bond positions in 2017.

3.3 Potential Channels

What are the potential economic forces behind the accumulation of financial assets by corporate giants? There are two main (non-exclusive) explanations emphasized in existing works, with some outstanding debate about their relative importance.

The first is related to liquidity motives. Because capital markets are imperfect, firms have incentives to hoard liquid assets to self-insure against future shocks, such as negative cash-flow shocks or the arrival of an investment opportunity. This explanation would suggest that, *ceteris paribus*, firms with the most difficulty in accessing capital markets would hold more

¹⁵A comparison of Figures 1 and 2 in Faulkender et al. (2019) is consistent with this interpretation. Data that explicitly account for foreign affiliates estimate financial assets that are significantly larger than what is reported in the Financial Accounts (\$3.5T vs. \$2.5T in 2008 for example).

financial assets. A complementary argument is that firms with high intangible capital might find it harder to raise external financing, as these assets are poor collateral (Falato et al., 2022; Li, 2019). However, some have argued that this picture is likely incomplete when looking at the largest firms in the economy. Anecdotally, the largest holders of financial assets rarely have difficulty accessing capital markets. For instance, Apple has a pristine AA credit rating and carried out large debt issuances as well as payouts during this time.

The second main explanation is related to cross-border tax incentives (Foley et al., 2007; Faulkender et al., 2019; Harford et al., 2017; Graham and Leary, 2018). To avoid paying U.S. taxes, multinationals can shift earnings abroad and hold them in financial assets instead of distributing them. This gives them the option to defer taxes until a tax reform or a tax holiday occurs at some future date (Albertus et al., 2022). A complementary argument is that shifting earnings across jurisdictions is relatively easier for firms with more intangible assets, such as software and patents, that are not attached to a physical location (Desai et al., 2006).

Disentangling the relative importance of these (nonmutually exclusive) forces is difficult. Looking at simple correlations, simple reduced-form proxies for financial constraints tend not to correlate strongly with the marketable securities portion of firms' financial portfolios, as shown in Figure A.2a in the Internet Appendix. On the other hand, in line with the role of firms in the "tech" and "pharma" sectors pointed out above, Figure A.2b in the Internet Appendix confirms that firms with a lower share of fixed assets, lower fixed capital expenditures, higher R&D expenditures, or lower book-to-market ratios have more financial assets (the differences in marketable securities are even more pronounced).¹⁶

Nevertheless, we cannot draw definitive conclusions from these simple correlations alone. For example, Gu (2017) argues that firm characteristics can lead to a joint determination

¹⁶Table A.2 in the Internet Appendix shows that these correlations are broadly confirmed in a multivariate panel regression setting. These patterns are broadly in line with Duchin et al. (2017) who use a 2SLS approach using unexpected cash-flow shocks. They are also consistent with Pinkowitz et al. (2016) who show that U.S. firms hold more cash on average due to the firms at the tail of the U.S. distribution of R&D, which are also the firms at the tail of the U.S. distribution of cash/assets. Li (2019) also shows that corporate savings are concentrated in intangible-intensive sectors.

of financial assets, foreign operations, and intangible capital.¹⁷ To go beyond correlations, the next two sections study portfolio dynamics in two recent "event studies": (i) the 2017 tax reform that aimed to reduce incentives to hoard assets abroad for tax reasons, and (ii) the COVID-19 shock that induced firms to increase financial assets for liquidity reasons. An advantage of this approach is that it exploits within-firm variation around two large events each directly related to the two main forces at play. Moreover, our data are ideal for looking at changes in the composition of financial assets, not just their level. This is valuable as it is entirely plausible that different financial assets play different roles.

4 Reversal and Portfolio Shift Since 2017

4.1 The Tax Reform of 2017

To explore the role of cross-border tax incentives in financial asset accumulation, we exploit the drastic change in corporate taxation introduced by the recent tax reform. More specifically, the Tax Cuts and Jobs Act (TCJA) aimed to reduce the tax incentives to keep "cash" abroad.¹⁸ Multinational taxation has become a central issue for policy makers worldwide, and our new data on the financial side of corporate balance sheets can help shed new light on the phenomenon.¹⁹

There is anecdotal evidence that corporations adjusted their financial assets portfolios in response to this reform. The most striking instance is Apple's announcement in February 2018 that it would pursue a "cash-neutral" policy going forward. Although the horizon of this

¹⁷Moreover, one of the central issues in corporate finance research is how to appropriately measure financial constraints at the firm-level. The use of reduced-form proxies has been subject to considerable debate (Farre-Mensa and Ljungqvist, 2016).

¹⁸The TCJA of 2017 lowered the U.S. federal corporate income tax rate from 35 to 21 percent and switched from a worldwide tax system to a territorial system. To reduce the incentives to shift profits to tax havens, the TCJA introduced three provisions: a U.S. tax on foreign income subject to low tax rates abroad; a reduced rate on foreign income derived from intangibles booked in the United States; and measures to limit the deductibility of certain payments suspected to shift income out of the United States.

¹⁹For instance, Garcia-Bernardo et al. (2020) find that the TCJA did not alter the location of firms' profits or economic activity. Other works studying the impact of the TCJA on firms include (Borochin et al., 2021; Beyer et al., 2021; Olson, 2019).

reduction was not made explicit, the motives behind it were transparently linked to the tax reform:

The tax reform will allow us to pursue a more optimal capital structure for our company. Our current net cash position is \$163 billion, and given the increased financial and operational flexibility from the access to our foreign cash, we are targeting to become approximately net cash neutral over time.

Firms' natural response to such change tax incentives would imply a reversal in the growth of financial assets. Such a reversal is strikingly visible in the aggregate, as can be seen in Figure 3 above: total financial assets dropped by \$300B between 2017 and 2019. Importantly, the panel nature of our data allow us to examine which firms were more responsive and how the *composition* of their portfolios was affected.²⁰

As a first illustration, Apple experienced a drastic portfolio shift post-reform, in line with its announcement. Between 2017 and 2019, Apple's total financial assets shrank by over \$60B, equivalent to an annual rate of decrease of about 12%. Importantly, this reversal was driven by running down its bond portfolio: its corporate bond holdings fell by \$67B, while its U.S. government bond holdings decreased by \$20B. Apple's cash-like instruments rose modestly in comparison by \$21B, with its actual cash being virtually unchanged. The largest share of this reduction in financial assets was paid to shareholders, and Apple's book assets fell by almost \$40B over that period, a 10% drop. Apple was far from an isolated case, There were drastic portfolio shifts at other large firms, including Cisco, Microsoft, Amgen, Gilead Sciences, and Pepsi Co, with Alphabet being an exception. Cash-like instruments remain stable as firms actively run down large fractions of their bond portfolios.

Figure 5 displays the aggregate effects of the reform. In total, financial assets fell by \$300B, eliminating one-third of the previous ten years' growth in just two years. Beyond the level, there was a drastic shift in composition as well: cash-like instruments did not change,

²⁰Given existing work, it is not surprising that the *level* of financial assets fell, see for instance Foley et al. (2007) or Faulkender et al. (2019).

and the liquidation of corporate bonds can explain two-thirds of the total drop on its own. Moreover, the rundown of these bond portfolios was associated with a sharp rise in payouts to shareholders of about \$248B, mostly through massive share repurchase programs.²¹ In other words, a significant share of the financial assets accumulated in the previous decades left corporate balance sheets over a short timeframe.²²

Finally, we conduct a difference-in-difference analysis to isolate the differential effect on tech and pharma firms. As noted above, shifting earnings across jurisdictions is relatively easier than for firms with more intangible assets, such as software and patents, that are not attached to a physical location (Desai et al., 2006; Foley et al., 2007; Faulkender et al., 2019; Harford et al., 2017; Graham and Leary, 2018). If cross-border tax incentives are important drivers of some financial asset accumulation, we should observe within-firm changes around the reform. On the other hand, if some financial assets are primarily driven by intrinsic features of these intangibles-intensive firms ("selection" in the words of Gu (2017)), these effects would largely be differenced-out.

To estimate the responses of tech and pharma firms relative to other sectors, we run the following regression:

$$y_{i,t} = Post_t \times \mathbf{1}_i\{tech\} + Post_t \times \mathbf{1}_i\{pharma\} + \alpha_i + \nu_t + \varepsilon_{i,t},$$

where $y_{i,t}$ is an outcome variable for firm i in year t , $Post_t$ is a dummy equal to 1 for years 2018 and 2019 and 0 for years 2012–2017, and (α_i, ν_t) are firm and year fixed effects, respectively. Table 2, Panel A reports the results for the financial assets level and composition, as well as payouts. The results confirm the key role played by these sectors in driving the aggregate pattern. Column (1) shows a decline in financial assets relative to other sectors, and columns (2) and (3) reveal that the decline is entirely driven by a rundown of marketable securities,

²¹This is in line with the classical literature on payouts and repatriation tax (Hines and Hubbard, 1990; Grubert, 1998; Grubert and Mutti, 2001; Desai et al., 2001, 2007).

²²Note that it is unclear whether these payouts represent genuine new cross-border flows since they were largely financed by selling existing holdings U.S. assets. Our data only measures consolidated firm assets, so, unfortunately, we cannot directly trace flows across locations.

while cash-like instruments did not change significantly. The economic magnitude of the reduction in marketable securities is large: a 6pp drop for tech firms corresponds to 33% reduction relative to their average, and a 5pp for pharma firms corresponds to a 50% reduction. Columns (4) and (5) highlight the sharp decrease in U.S. government bonds and corporate bonds. Column (6) reveals a large increase in payouts, which are especially strong in the tech sector.²³ The different effects across asset classes suggest they play different roles.

Table 2, Panel B uses a dummy for high foreign income (relative to sales) instead of the tech and pharma dummies. The effect goes in a similar direction, with firms with more foreign income being more likely to reduce holdings of marketable securities and increase payouts following the reform. The size of the effect is smaller than in Panel A, consistent with tech and pharma firms having more foreign income than others firms in our sample.

A dynamic corporate finance perspective is helpful to understand why firms decided to liquidate their bonds rather than their cash. Indeed, if bonds were simply understood as a cash substitute with higher yield, they should not have been liquidated. Instead, bonds are one type of asset that firms managed actively, with different attributes from cash or capital. Importantly, bonds are not as good as a store of values as cash: they are harder to sell quickly and to pledge as collateral. Thinking about offshore bonds as an investment in a multi-faceted asset, the tax reform should lead to disinvestment in these assets since worldwide taxation encourages overinvestment abroad (Albertus et al., 2022).

4.2 The 2020 Liquidity Shock: Cash is Back

Finally, we examine firms' responses to the liquidity crisis triggered by the outbreak of COVID-19 in early 2020. In February 2020, it became clear that the pandemic would have large economic effects and expose many firms to a sharp drop in revenues. In what was labeled as a

²³Unreported dynamic coefficient plots show that the majority of the effects occurred in 2018 immediately after the reform. Note that our findings differ from Duchin et al. (2017) who show that tax costs of repatriating earnings are not significantly related to the composition of financial assets toward riskier assets. Two potential sources behind this discrepancy include the fact that we examine a different time period, and that U.S. government securities are classified as safe in that study's analysis.

"corporate dash for cash" (Acharya and Steffen, 2020), this period witnessed historic efforts by corporations to increase their liquidity buffers, which often fell after the tax reform, to prepare for difficult times ahead. Anecdotally, many firms explicitly cited precautionary reasons and a desire to strengthen their balance sheets when explaining the "dash."²⁴ Our data allow us to go one step further and study the shift in the composition of financial portfolios. Observing firms' active management of their financial portfolios in this period is particularly interesting because it reveals which assets are deemed most appropriate for liquidity management.²⁵

We observe a clear shift toward cash-like instruments and the safest types of securities such as Treasuries. Figure 5 shows aggregate dynamics all the way to 2021Q4. In one quarter, financial assets grew by \$100 billion, while cash-like instruments grew even more, by \$150 billion. This amounted to a drastic portfolio shift: the share of cash-like instruments jumped to 57%, as opposed to 50% three months earlier and only 43% in 2017 on the eve of the tax reform. It is strikingly clear that we do not observe any spike in corporate bond holdings. This is in line with these assets being less attractive for the purpose of liquidity management, as they are riskier and less liquid relative to other assets. In fact, there is extensive evidence that corporate bonds specifically became extremely illiquid during this episode (Haddad et al., 2020; Kargar et al., 2020).

We formally test whether firms most affected by the COVID-19 shock reacted differently by estimating the following regression:

$$y_{i,t} = Post_t \times Covid_Exp_i + \alpha_i + \nu_t + \varepsilon_{i,t},$$

where $y_{i,t}$ are financial assets of firm i in year t , $Post_t$ is a dummy equal to 1 for quarters from 2020Q1 to 2020Q4 and 0 for quarters 2018Q4–2019Q4, and (α_i, ν_t) are firm and quarter

²⁴For example, Chevron's CEO said: "We are taking actions expected to preserve cash, support our balance sheet strength, lower short-term production, and preserve long-term value." A large share of increased liquidity buffers were financed by issuing new debt (Acharya and Steffen, 2020; Darmouni and Siani, 2022).

²⁵Cardella et al. (2021) use the cash and cash equivalents versus short-term investments in Compustat to study the role of liquidity management in influencing firms' composition of financial assets. Nevertheless, we acknowledge that other factors might also have been at play in 2020.

fixed effects, respectively. $Covid_Exp_i$ measures the exposure to COVID-19 cash-flow shock. Our measure is the abnormal change in industry employment from Chodorow-Reich et al. (2022), calculated as the negative of the percent change in national employment in the firm's three-digit NAICS industry between 2019Q2 and 2020Q2 less the trailing five-year change. $Covid_Exp$ is standardized at the industry level. Table 3 reports the results for different financial assets. The results confirm the hypothesis that firms most affected by the COVID-19 shock increased savings in liquid assets.

Column (1) shows the increase in financial assets relative to other industries, and columns (2) to (5) reveal that the increase is mostly driven by the accumulation of cash-like instruments. A one standard deviation increase in $Covid_Exp$ leads to a 1.9 p.p. increase in financial assets over assets, which is a 16% increase with respect to the average in the pre-period. Cash-like instruments alone increased by 1.3 p.p., which is a 19% increase with respect to the pre-period average. Although there is some increase in U.S. government bond holding as shown in column (4), the increase is less than one-fourth of the cash-like assets in column (2). Column (5) reveals that corporate bond holdings are not affected. This portfolio shift suggests cash plays a different role than less liquid assets, and it is a better liquidity buffer for hard times.

4.3 Potential Risks

An high share of marketable securities can potentially expose firms to additional risks relative to if they were holding only cash-like instruments. A clear example of that is duration risk: when interest rates increase, the value of bonds falls. The year 2022 saw a drastic fall in bond prices due to unanticipated rate hikes by the Federal Reserve. The negative effects on financial institutions have been widely discussed.

Our data shows that corporate giants have also been impacted. In particular, the largest holders of marketable securities experienced large negative returns on their portfolio in 2022, in sharp contrast with the previous ten years. To show this, we collect detailed financial income information for five important firms: Apple, Microsoft, Alphabet, Amazon, and Ford.

Although there is no comprehensive data on returns on firms' financial portfolios, we carefully investigate their financial statements to estimate financial income, defined as the sum of interest and dividends income and net realized and unrealized gains, divided by lagged financial assets.²⁶

Figure 6 shows the time series of estimated annual returns for the five selected firms. A firm like Apple experienced a negative 5 percent return on its portfolio, amounting to over \$9 billions in losses. This is in contrast to a historical average gain of about \$1.3B a year. Alphabet and Microsoft also experienced large losses. Ford and Amazon faced much smaller losses, in line with them having a significantly larger share of cash-like instruments relative to the other three. Overall, these findings suggest that the rise of marketable securities in the aggregate portfolio can potentially expose the U.S. corporate sector to new risks.²⁷

4.4 Discussion

Taken together, our novel data and evidence help us better understand the behavior of corporate giants. Instead of simple cash balances, these firms actively manage financial portfolios to meet their needs. We have shown that firms do not just manage the levels, but the composition of these portfolios as well. Indeed, the shifts between cash-like instruments and marketable securities we document reveal clear patterns.

Importantly, liquidity motives alone cannot fully explain trends in financial assets accumulation. The trajectory of corporate bond holdings is particularly emblematic. After a sustained rise since the mid-2000s, corporate bonds and marketable securities started to leave corporate balance sheets immediately after the 2017 tax reform, a shift that did not reverse when the liquidity crisis of 2020 struck. When in need of precautionary buffers, firms prefer cash-like instruments to riskier, less liquid assets like corporate bonds. On the other hand, firms' management of their marketable securities portfolio is consistent with tax optimization.

²⁶See Table 4b in the Internet Appendix for more details.

²⁷Of course, this is only one side of the duration risk faced by the firm, the net duration risk also includes liabilities and non-financial assets.

Firms have incentives to delay repatriating offshore earnings by hoarding financial assets until a tax holiday arrives. Given that these assets are not used to manage liquidity, securities like corporate bonds are appealing: although they are more illiquid, their higher yield reduces the cost of carry in a low interest rate environment.²⁸ Our findings suggest that a combination of tax incentives and reach for yield is a plausible explanation for the rise and fall of corporate bond holdings. Interestingly, U.S. government bonds form an intermediate category between cash-like instruments and corporate bonds and are used differently by different firms.

This evidence can help shed light on the debate on the drivers of the "cash" of corporate giants. The panel structure of our data on financial assets composition uncovers that different financial assets play different roles, with different economic magnitudes. Holdings of marketable securities are large and primarily driven by cross-border tax incentives. Cash-like instruments, driven by liquidity motives, grew at a much slower rate until the 2020 liquidity crisis. Our data represent the richest publicly available source on this dimension, and we hope it can help future research to achieve a better understanding of the role of these large firms in crucial areas such as regulation, taxation, and macro-finance.

²⁸Duchin et al. (2017) show formally that unconstrained firms have incentives to invest in illiquid assets because they carry a liquidity premium. Additional analysis shows evidence that firms with a smaller share of cash-like instruments have larger financial income, giving credence to the reach-for-yield hypothesis. Although there is no comprehensive data on returns on firms' financial portfolios, we study five important firms: Apple, Microsoft, Alphabet, Amazon, and Ford. We carefully investigate their financial statements to estimate financial income, defined as the sum of interest and dividends income and net realized and unrealized gains, divided by lagged financial assets. See Table 4 in the Internet Appendix for more details.

References

- Acharya, Viral V, and Sascha Steffen, 2020, The risk of being a fallen angel and the corporate dash for cash in the midst of covid, *CEPR COVID Economics* 10.
- Aghion, Philippe, Antonin Bergeaud, Timo Boppart, Peter J Klenow, and Huiyu Li, 2019, A theory of falling growth and rising rents, Technical report, National Bureau of Economic Research.
- Albertus, James F, Brent Glover, and Oliver Levine, 2022, Foreign investment of us multinationals: The effect of tax policy and agency conflicts., *Journal of financial economics* 144, 298–327.
- Almeida, Heitor, Murillo Campello, Igor Cunha, and Michael S Weisbach, 2014, Corporate liquidity management: A conceptual framework and survey, *Annu. Rev. Financ. Econ.* 6, 135–162.
- Almeida, Heitor, Murillo Campello, and Michael S Weisbach, 2004, The cash flow sensitivity of cash, *The Journal of Finance* 59, 1777–1804.
- Autor, David, David Dorn, Lawrence F Katz, Christina Patterson, and John Van Reenen, 2020, The fall of the labor share and the rise of superstar firms, *The Quarterly Journal of Economics* 135, 645–709.
- Azar, José A, Jean-Francois Kagy, and Martin C Schmalz, 2016, Can changes in the cost of carry explain the dynamics of corporate “cash” holdings?, *The Review of Financial Studies* 29, 2194–2240.
- Bates, Thomas W, Kathleen M Kahle, and René M Stulz, 2009, Why do us firms hold so much more cash than they used to?, *The journal of finance* 64, 1985–2021.
- Begenau, Juliane, and Berardino Palazzo, 2021, Firm selection and corporate cash holdings, *Journal of Financial Economics* 139, 697–718.

- Beyer, Brooke, Jimmy Downes, Mollie Mathis, and Eric T Rapley, 2021, Early evidence on the use of foreign cash following the tax cuts and jobs act of 2017, *Available at SSRN 3818149* .
- Bolton, Patrick, Hui Chen, and Neng Wang, 2011, A unified theory of tobin's q, corporate investment, financing, and risk management, *The Journal of Finance* 66, 1545–1578.
- Borochin, Paul, Murat Alp Celik, Xu Tian, and Toni M Whited, 2021, Identifying the heterogeneous impact of highly anticipated events: Evidence from the tax cuts and jobs act, *Available at SSRN 3806560* .
- Cardella, Laura, Douglas Fairhurst, and Sandy Klasa, 2021, What determines the composition of a firm's cash reserves?, *Journal of Corporate Finance* 68, 101924.
- Chen, Peter, Loukas Karabarbounis, and Brent Neiman, 2017, The global rise of corporate saving, *Journal of Monetary Economics* 89, 1–19.
- Chen, Zhiyao, and Ran Duchin, 2019, Do nonfinancial firms use financial assets to risk-shift? evidence from the 2014 oil price crisis, Technical report, Working paper, University of Washington.
- Chodorow-Reich, Gabriel, Olivier Darmouni, Stephan Luck, and Matthew Plosser, 2022, Bank liquidity provision across the firm size distribution, *Journal of Financial Economics* 144, 908–932.
- Crouzet, Nicolas, and Janice Eberly, 2020, Rents and intangible capital: A q+ framework, *Unpublished manuscript, Northwestern University* .
- Crouzet, Nicolas, Neil Mehrotra, et al., 2017, Small and large firms over the business cycle, *Unpublished working paper* 101.
- Cunha, Igor, and Joshua Pollet, 2015, Why do firms hold cash? evidence from demographic demand shifts, *The Review of Financial Studies* .

- Darmouni, Olivier, and Kerry Siani, 2022, Bond market stimulus: Firm-level evidence from 2020-21 .
- De Loecker, Jan, Jan Eeckhout, and Gabriel Unger, 2020, The rise of market power and the macroeconomic implications, *The Quarterly Journal of Economics* 135, 561–644.
- De Simone, Lisa, Joseph D Piotroski, and Rimmy E Tomy, 2019, Repatriation taxes and foreign cash holdings: The impact of anticipated tax reform, *The Review of Financial Studies* 32, 3105–3143.
- Denis, David J, and Valeriy Sibilkov, 2010, Financial constraints, investment, and the value of cash holdings, *The Review of Financial Studies* 23, 247–269.
- Desai, Mihir A, C Fritz Foley, and James R Hines Jr, 2001, Repatriation taxes and dividend distortions, Technical report, National Bureau of Economic Research.
- Desai, Mihir A, C Fritz Foley, and James R Hines Jr, 2006, The demand for tax haven operations, *Journal of Public economics* 90, 513–531.
- Desai, Mihir A, C Fritz Foley, and James R Hines Jr, 2007, Dividend policy inside the multinational firm, *Financial management* 5–26.
- Döttling, Robin, Tomislav Ladika, and Enrico C Perotti, 2018, The (self-) funding of intangibles .
- Duchin, Ran, Thomas Gilbert, Jarrad Harford, and Christopher Hrdlicka, 2017, Precautionary savings with risky assets: When cash is not cash, *The Journal of Finance* 72, 793–852.
- Eisfeldt, Andrea L, 2017, Comment on the global rise of corporate saving by peter chen, loukas karabarounis, and brent neiman, *Journal of Monetary Economics* 89.
- Eisfeldt, Andrea L, and Tyler Muir, 2016, Aggregate external financing and savings waves, *Journal of Monetary Economics* 84, 116–133.

- Erel, Isil, Yeejin Jang, and Michael S Weisbach, 2020, The corporate finance of multinational firms, Technical report, National Bureau of Economic Research.
- Falato, Antonio, Dalida Kadyrzhanova, Jae Sim, and Roberto Steri, 2022, Rising intangible capital, shrinking debt capacity, and the us corporate savings glut, *The Journal of Finance* 77, 2799–2852.
- Farre-Mensa, Joan, and Alexander Ljungqvist, 2016, Do measures of financial constraints measure financial constraints?, *The Review of Financial Studies* 29, 271–308.
- Faulkender, Michael W, Kristine W Hankins, and Mitchell A Petersen, 2019, Understanding the rise in corporate cash: Precautionary savings or foreign taxes, *The Review of Financial Studies* 32, 3299–3334.
- Fernandes, Nuno, and Halit Gonenc, 2016, Multinationals and cash holdings, *Journal of Corporate Finance* 39, 139–154.
- Ferreira, Miguel H, 2021, Aggregate implications of corporate lending by nonfinancial firms .
- Foley, C Fritz, Jay C Hartzell, Sheridan Titman, and Garry Twite, 2007, Why do firms hold so much cash? a tax-based explanation, *Journal of financial economics* 86, 579–607.
- Gabaix, Xavier, 2011, The granular origins of aggregate fluctuations, *Econometrica* 79, 733–772.
- Gao, Xiaodan, Toni M Whited, and Na Zhang, 2018, Corporate money demand, *Available at SSRN 3165532* .
- Garcia-Bernardo, Javier, P Janský, and Gabriel Zucman, 2020, Did the tax cuts and jobs act reduce profit shifting by us multinational companies, Technical report, Working paper.
- Garcia-Bernardo, Javier, and Petr Janský, 2022, Profit shifting of multinational corporations worldwide, *arXiv preprint arXiv:2201.08444* .

- Gomez, Matthieu, and Emilien Gouin-Bonenfant, 2020, A q-theory of inequality .
- Graham, John R, and Mark T Leary, 2018, The evolution of corporate cash, *The Review of Financial Studies* 31, 4288–4344.
- Grubert, Harry, 1998, Taxes and the division of foreign operating income among royalties, interest, dividends and retained earnings, *Journal of Public Economics* 68, 269–290.
- Grubert, Harry, and John Mutti, 2001, *Taxing International Business Income* (American Enterprise Institute).
- Gu, Tiantian, 2017, Us multinationals and cash holdings, *Journal of Financial Economics* 125, 344–368.
- Gutiérrez, Germán, and Thomas Philippon, 2017, Declining competition and investment in the us, Technical report, National Bureau of Economic Research.
- Haddad, Valentin, Alan Moreira, and Tyler Muir, 2020, When selling becomes viral: Disruptions in debt markets in the covid-19 crisis and the fed’s response, Technical report, National Bureau of Economic Research.
- Hanlon, Michelle, Rebecca Lester, and Rodrigo Verdi, 2015, The effect of repatriation tax costs on us multinational investment, *Journal of Financial Economics* 116, 179–196.
- Harford, Jarrad, Cong Wang, and Kuo Zhang, 2017, Foreign cash: Taxes, internal capital markets, and agency problems, *The Review of Financial Studies* 30, 1490–1538.
- Harris, Milton, and Artur Raviv, 2017, Why do firms sit on cash? an asymmetric information approach, *The Review of Corporate Finance Studies* 6, 141–173.
- Hartman-Glaser, Barney, Hanno Lustig, and Mindy Z Xiaolan, 2019, Capital share dynamics when firms insure workers, *The Journal of Finance* 74, 1707–1751.

- Hines, James R, and R Glenn Hubbard, 1990, Coming home to america: Dividend repatriations by us multinationals, in *Taxation in the global economy*, 161–208 (University of Chicago Press).
- Huang, Teng, and Stefano Sacchetto, 2022, Surfing the cycle: Cyclical investment opportunities and firms' risky financial assets, *Available at SSRN 4010801* .
- Kargar, Mahyar, Benjamin T Lester, David Lindsay, Shuo Liu, and Pierre-Oliver Weill, 2020, Corporate bond liquidity during the covid-19 crisis .
- Li, Ye, 2019, Fragile new economy: The rise of intangible capital and financial instability, *Columbia Business School Research Paper* 2018–19.
- Liu, Ernest, Atif Mian, and Amir Sufi, 2019, Low interest rates, market power, and productivity growth, Technical report, National Bureau of Economic Research.
- Mian, Atif, Ludwig Straub, and Amir Sufi, 2020, The saving glut of the rich .
- Olson, Erik, 2019, Unlocking trapped foreign cash, investor types, and firm payout policy, *Investor Types, and Firm Payout Policy (November 1, 2019)* .
- Pinkowitz, Lee, René M Stulz, and Rohan Williamson, 2016, Do us firms hold more cash than foreign firms do?, *The Review of Financial Studies* 29, 309–348.
- Song, Jae, David J Price, Fatih Guvenen, Nicholas Bloom, and Till Von Wachter, 2019, Firming up inequality, *The Quarterly journal of economics* 134, 1–50.

Figures and Tables

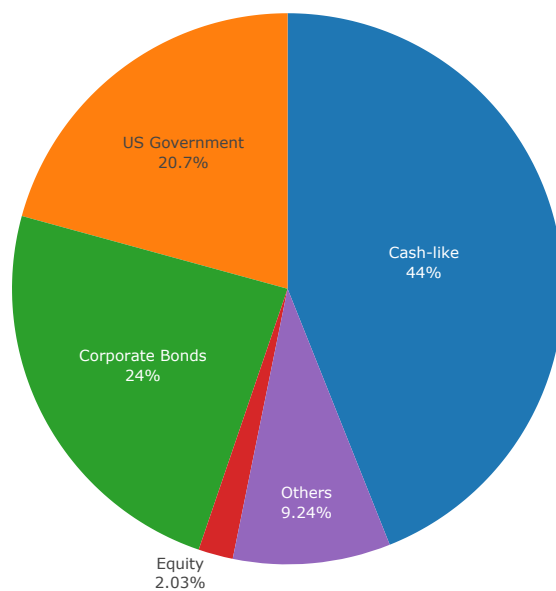


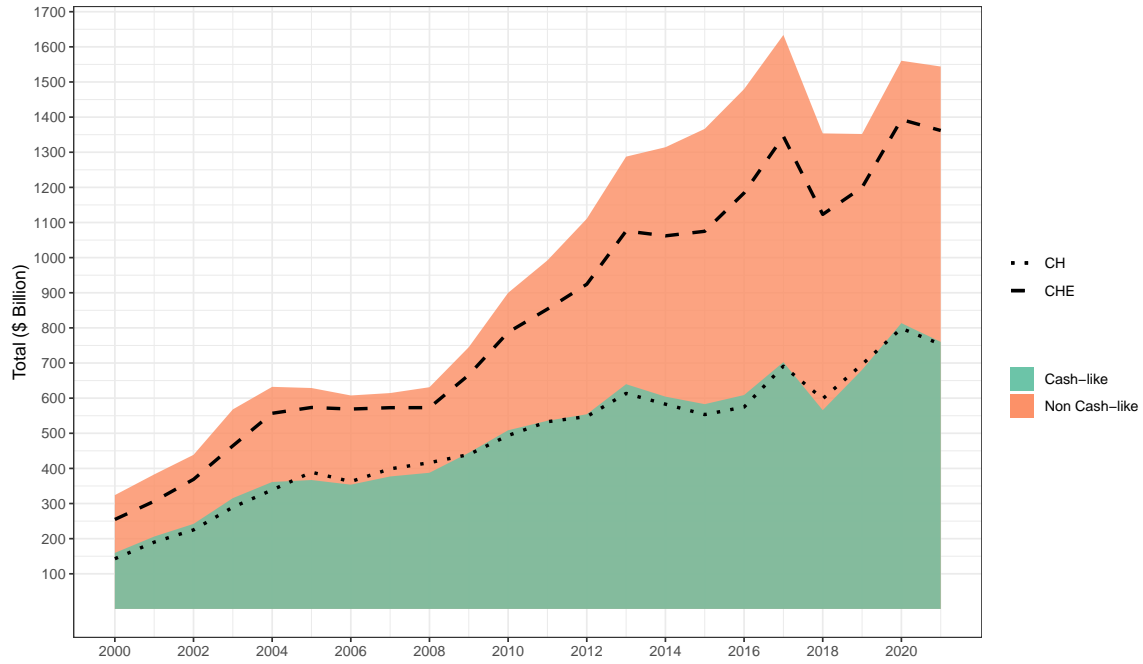
Figure 1 – Financial Assets Portfolio Composition of Nonfinancial Corporations in 2017

This financial assets portfolio composition for our sample of firms in 2017. "Cash-like" is defined as the sum of cash, MMF, deposits, and commercial paper if this information is reported, and "cash and cash equivalents" otherwise. "U.S. Government" bonds include Treasuries and Agency securities.

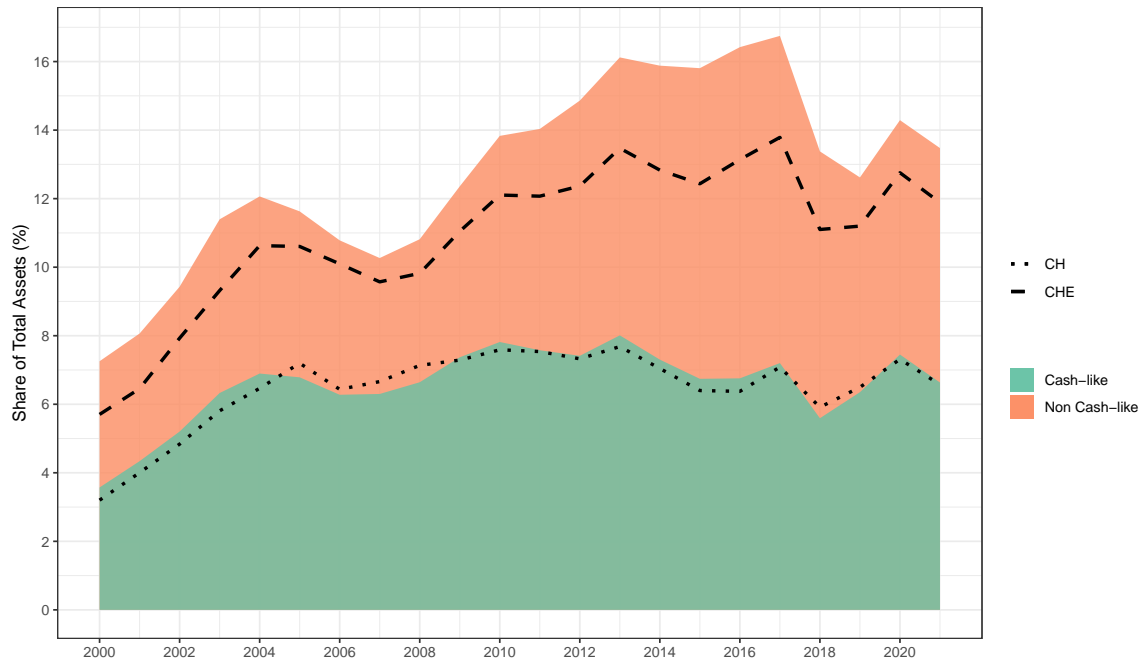
	2017			
	Adjusted Cost	Unrealized Gains	Unrealized Losses	Fair Value
Cash	\$ 7,982	\$ —	\$ —	\$ 7,982
Level 1:				
Money market funds	6,534	—	—	6,534
Mutual funds	799	—	(88)	711
Subtotal	7,333	—	(88)	7,245
Level 2:				
U.S. Treasury securities	55,254	58	(230)	55,082
U.S. agency securities	5,162	2	(9)	5,155
Non-U.S. government securities	7,827	210	(37)	8,000
Certificates of deposit and time deposits	5,832	—	—	5,832
Commercial paper	3,640	—	—	3,640
Corporate securities	152,724	969	(242)	153,451
Municipal securities	961	4	(1)	964
Mortgage- and asset-backed securities	21,684	35	(175)	21,544
Subtotal	253,084	1,278	(694)	253,668
Total	<u>\$ 268,399</u>	<u>\$ 1,278</u>	<u>\$ (782)</u>	<u>\$ 268,895</u>

Figure 2 – Apple Financial Instruments Table

This figure displays the Financial Instrument Table for Apple in 2017. Available on the SEC website.



(a) Aggregate Financial Assets



(b) Financial Assets over Assets

Figure 3 – The Growth in Financial Assets

This figure plots the growth in financial assets for our sample of firms. Panel (a) plots aggregate financial assets, while panel (b) plots total financial assets over total assets. "Cash-like" is defined as the sum of cash, MMF, deposits, and commercial paper if this information is reported, and "cash and cash equivalents" otherwise. "CH" is Cash and "CHE" is Cash and Short-Term investment from Compustat.

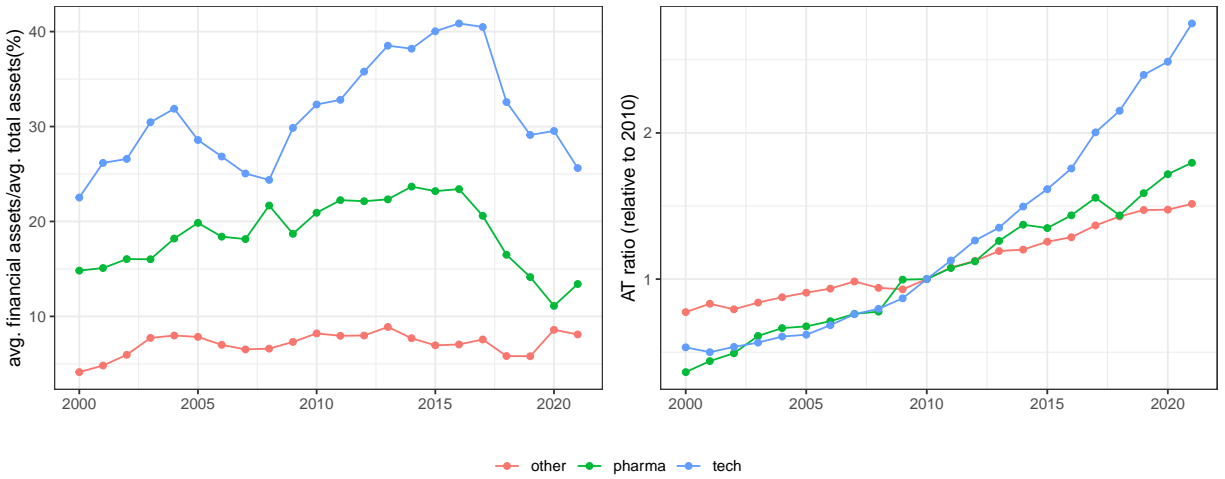


Figure 4 – Sectoral Composition Effects Behind Aggregate Growth

This figure plots the aggregate growth for three sectors in our sample: pharmaceutical firms, technological firms, and others, as defined in Table A.3 in the Internet Appendix. The left panel presents the growth in the ratio of average financial assets over average assets within each industry. The right panel shows the growth of aggregate total assets within each industry relative to 2010.

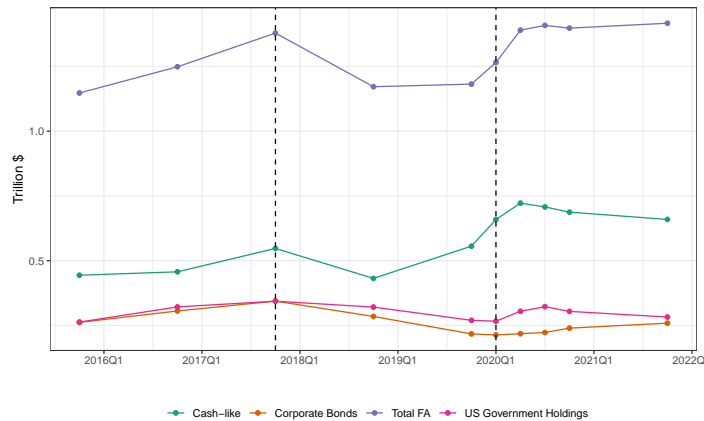


Figure 5 – Aggregate Portfolio Dynamics: 2015–2021

This figure plots the aggregate dynamics of different asset classes from 2015 to 2020Q1 in our sample. The first vertical dash line corresponds to the TCJA. The second vertical dash line corresponds to COVID-19 liquidity crisis. "Cash-like" is defined as the sum of cash, MMF, deposits, and commercial paper if this information is reported, and "cash and cash equivalents" otherwise. "U.S. government holdings" include Treasuries and agency debt.

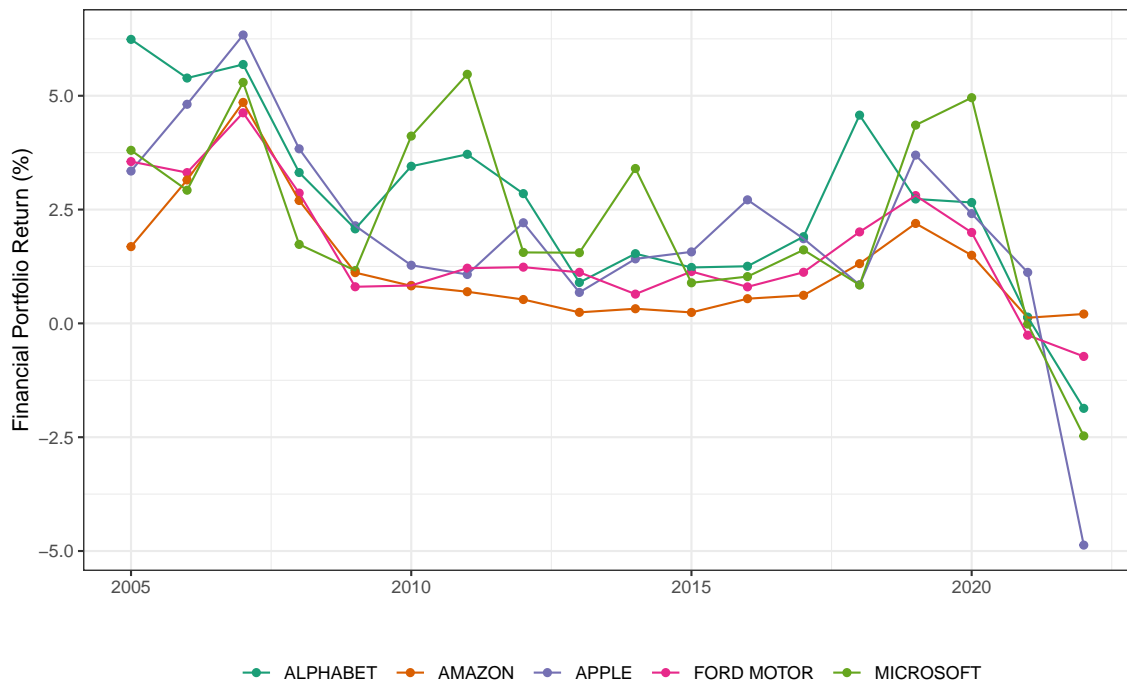


Figure 6 – Estimated portfolio returns

This figure plots the estimated annual portfolio returns dynamics from 2005 to 2022. Returns are defined as the ratio between financial income and the lag of total financial assets. Financial income is the sum of interest and dividends income, net realized gains and net unrealized gains on marketable securities.

	Total in USD Bi				Share of Financial Assets (%)				Share of Total Assets (%)			
	2000	2012	2017	2021	2000	2012	2017	2021	2000	2012	2017	2021
Cash-like instruments	159.72	571.04	740.52	760.46	49.27	50.49	43.95	49.24	3.50	7.40	7.19	6.63
U.S. government debt	26.22	227.01	349.49	283.00	8.09	20.07	20.75	18.32	0.57	2.94	3.39	2.47
Corporate bonds	29.18	144.79	404.79	261.88	9.00	12.80	24.03	16.96	0.64	1.88	3.93	2.28
Equities	28.74	27.41	34.28	67.24	8.86	2.42	2.04	4.35	0.63	0.36	0.33	0.59
Others	80.35	160.63	155.62	155.85	24.78	14.20	9.24	10.09	1.76	2.08	1.51	1.36
Total	324.20	1,130.89	1,684.71	1,544.33	–	–	–	–	7.10	14.66	16.35	13.46

Table 1 – The Composition of Financial Assets

This table displays the composition of financial assets in our sample. "Cash-like" is defined as the sum of cash, MMF, deposits, and commercial paper if this information is reported, and "cash and cash equivalents" otherwise. "U.S. government" includes Treasuries and agency debt. "Others" contain all items that are either clearly not cash-like instrument, U.S. government securities, corporate debt or equities, or are difficult to classify due to ambiguous language (e.g. "Other securities").

Panel A: tech vs pharma						
	total FA / AT(%) (1)	cash-like / AT(%) (2)	marketable securities/AT(%) (3)	US government bonds/AT(%) (4)	corporate bonds/AT(%) (5)	payouts / lagged AT(%) (6)
post:tech	-6.881*** (0.949)	-0.730 (0.736)	-6.151*** (0.730)	-2.135*** (0.337)	-1.795*** (0.451)	4.740*** (0.938)
post:pharma	-4.878*** (1.253)	0.059 (0.971)	-4.937*** (0.964)	-1.118** (0.444)	-2.051*** (0.595)	1.889 (1.238)
Observations	1,331	1,331	1,331	1,331	1,331	1,331
R ²	0.863	0.616	0.880	0.928	0.785	0.561
Adjusted R ²	0.841	0.555	0.861	0.916	0.751	0.491

Panel B: Foreign Income Share						
	total FA / AT(%) (1)	cash-like / AT(%) (2)	marketable securities/AT(%) (3)	US government bonds/AT(%) (4)	corporate bonds/AT(%) (5)	payouts / lagged AT(%) (6)
post:high_foreign_income	-2.802*** (0.790)	1.094* (0.600)	-3.896*** (0.607)	-1.212*** (0.277)	-1.317*** (0.370)	1.509* (0.773)
Observations	1,331	1,331	1,331	1,331	1,331	1,331
R ²	0.857	0.617	0.876	0.926	0.783	0.553
Adjusted R ²	0.834	0.556	0.856	0.914	0.749	0.482

Note:

*p<0.1; **p<0.05; ***p<0.01

Table 2 – Effects of Tax Reform: Difference-in-Difference Regressions

This table displays estimated coefficients of difference-in-difference regression of the components of financial assets shares on sector dummies with year and firm fixed effects. "Post" is a dummy variable, defined as 1 for year 2018 to 2019, as 0 for year 2012 to 2017. Only data from 2012 to 2019 in our sample are included in the regressions. "tech" and "pharma" are dummy variables defined as 1 for technological and pharmaceutical firms, respectively. "high_foreign_income" is a dummy variable defined as 1 if the average foreign income as a share of total sales between 2012 and 2016 is above median, 0 otherwise. Details about the classification of industries could be found in Table 5. "Cash-like" is defined as the sum of cash, MMF, deposits, and commercial paper if this information is reported, and "cash and cash equivalents" otherwise. "Marketable securities" are non-cash-like financial assets. "U.S. government" includes Treasuries and Agency debt. All columns include firm and year fixed effects. Columns (6) examines payouts (dividends + net equity repurchases) over lagged assets. Standard errors are in parenthesis.

	<i>Dependent variable:</i>				
	total FA / AT(%) (1)	cash-like / AT(%) (2)	marketable securities/AT(%) (3)	US government bonds/AT(%) (4)	corporate bonds/AT(%) (5)
post:covid_exposure	0.019*** (0.005)	0.013*** (0.004)	0.006** (0.003)	0.003** (0.001)	0.003 (0.002)
Observations	720	720	720	720	720
R ²	0.918	0.757	0.945	0.979	0.858
Adjusted R ²	0.901	0.706	0.934	0.974	0.828

Note:

*p<0.1; **p<0.05; ***p<0.01

Table 3 – Effects of COVID-19 Shock: Difference-in-Difference Regressions

This table displays estimated coefficients of difference-in-difference regression of the components of financial assets shares on COVID-19 exposure with year and firm fixed effects. "Post" is a dummy variable, defined as 1 for quarters 2020Q1 to 2021Q4, as 0 for 2018Q4 to 2019Q4. Only quarterly data from 2018Q4 to 2011Q4 in our sample are included in the regressions. "covid_exposure" is the abnormal change in industry employment as in Chodorow-Reich et al. (2022), calculated as the negative of the percent change in national employment in the firm's three-digit NAICS industry between 2019Q2 and 2020Q2 less the trailing five-year change. "Cash-like" is defined as the sum of cash, MMF, deposits, and commercial paper if this information is reported, and "cash and cash equivalents" otherwise. "Marketable securities" are non-cash-like financial assets. "U.S. government" includes Treasuries and Agency debt. All columns include firm and quarter fixed effects. Standard errors are in parenthesis.

(a) The Portfolio Income 2007 - 2021

Firm	Return (%)	Return spread over T-bill(%)	Income (Mi \$)	Cash-like share(%)
ALPHABET	2.53	1.76	1,369.71	27.49
MICROSOFT	2.53	1.59	1,976.87	7.85
APPLE	2.21	1.35	2,535.96	11.96
FORD MOTOR	1.53	0.75	636.73	41.39
AMAZON	1.19	0.41	203.47	58.36

(b) The Portfolio Income 2022

Firm	Return (%)	Return spread over T-bill(%)	Income (Mi \$)	Cash-like share(%)
APPLE	-4.87	-5.45	-9,279	16.19
MICROSOFT	-2.47	-2.60	-3,368	11.16
ALPHABET	-1.87	-3.29	-2,546	15.34
FORD MOTOR	-0.73	-2.15	-360	30.46
AMAZON	0.21	-1.22	166	38.72

Table 4 – Portfolio Income

This table displays the estimated financial portfolio, returns, excess returns over T-bill, total financial income and the average cash-like share for Alphabet, Microsoft, Apple, Ford, and Amazon. Panel (a) uses data only data from 2007 to 2021, and panel (b) uses only 2022 data. Financial income is the sum of interest and dividends income, net realized gains, and net unrealized gains on marketable securities. Return, r_p , is the financial income over the lagged financial assets, $r_{T,bill}$ is the annually cumulative 1-months T-bill return from CRSP computed over each firm's fiscal year, return spread over T-bill is the average difference between the firm's r_p and the one-month $r_{T,bill}$. The cash-like share is the average cash-like instrument as a share of total financial assets. "Cash-like" is defined as the sum of cash, MMF, deposits, and commercial paper if this information is reported, and "cash and cash equivalents" otherwise. Interest and dividends income are derived from the table for other income. Net realized gains and net unrealized gains on marketable securities are obtained from the statement of other comprehensive income, when available, along with the information from the statements for shareholders' equity, from the table for other income, and from the footnotes of the annual reports.

Internet Appendix

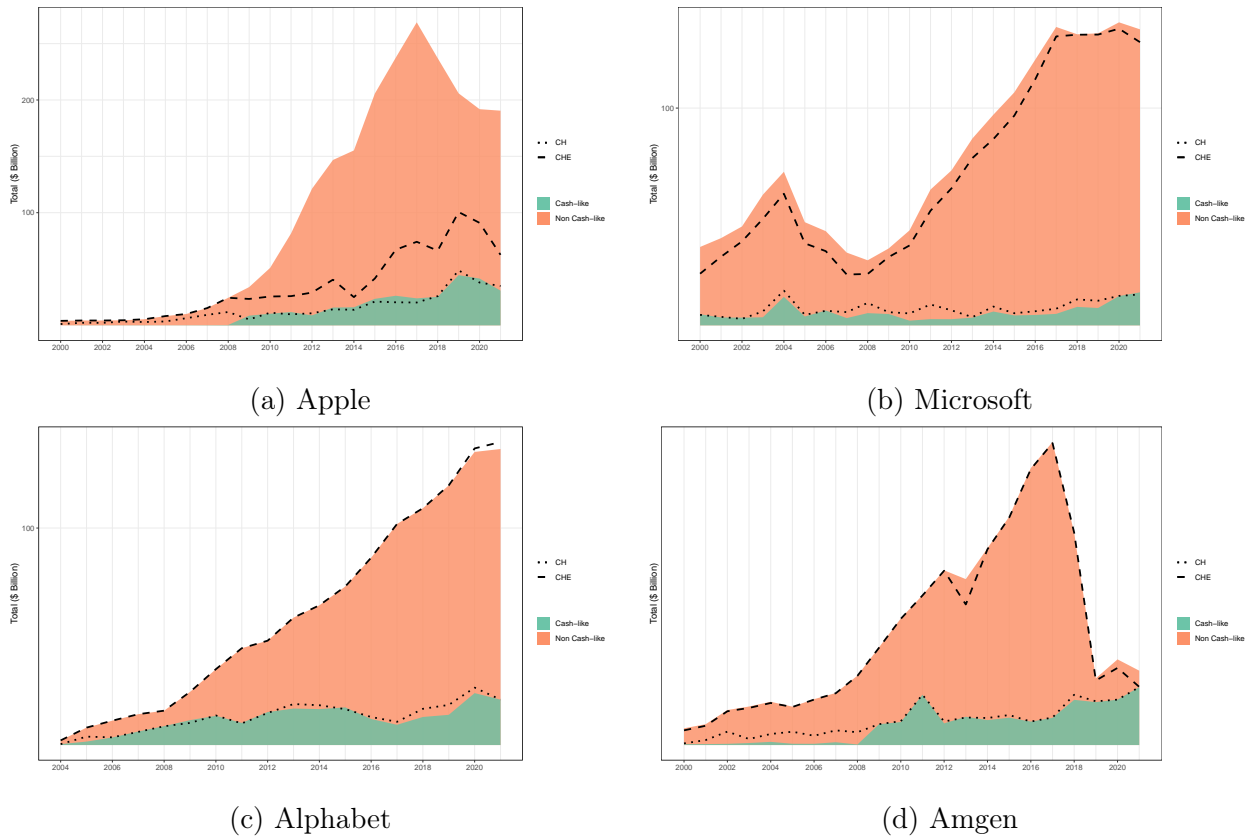
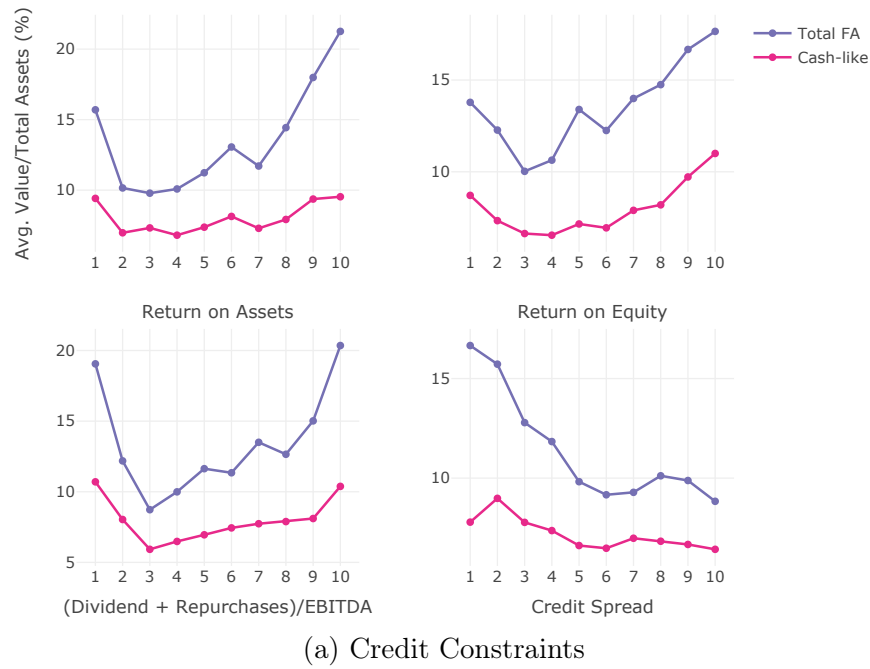
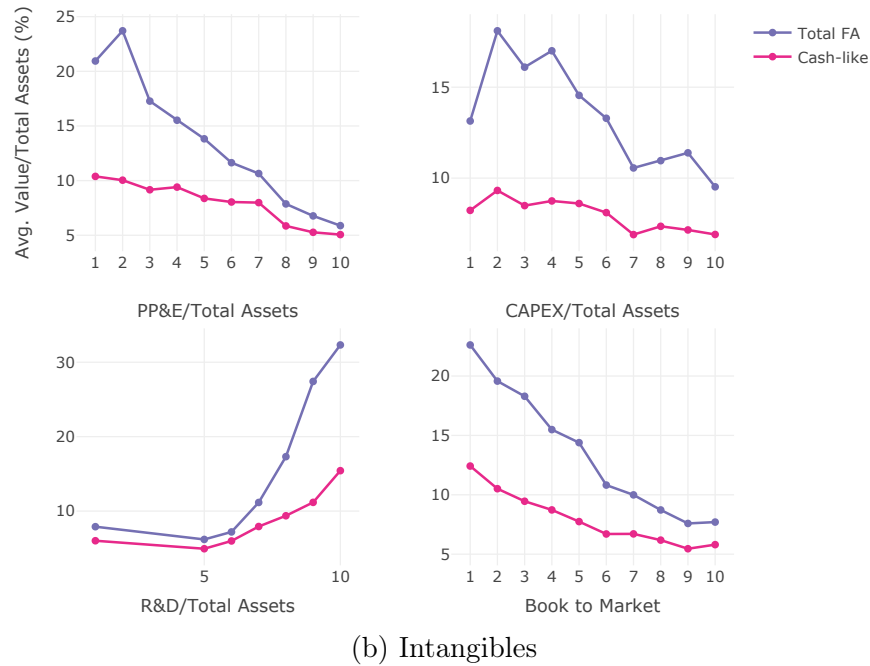


Figure A.1 – The Growth in Financial Assets: Four Examples

This figure plots the growth in financial assets for four firms in our sample: Apple, Microsoft, Alphabet and Amgen. "Cash-like" is defined as the sum of cash, MMF, deposits, and commercial paper if this information is reported, and "cash and cash equivalents" otherwise. "CHE" is the variable Cash and Short-Term investment from Compustat.



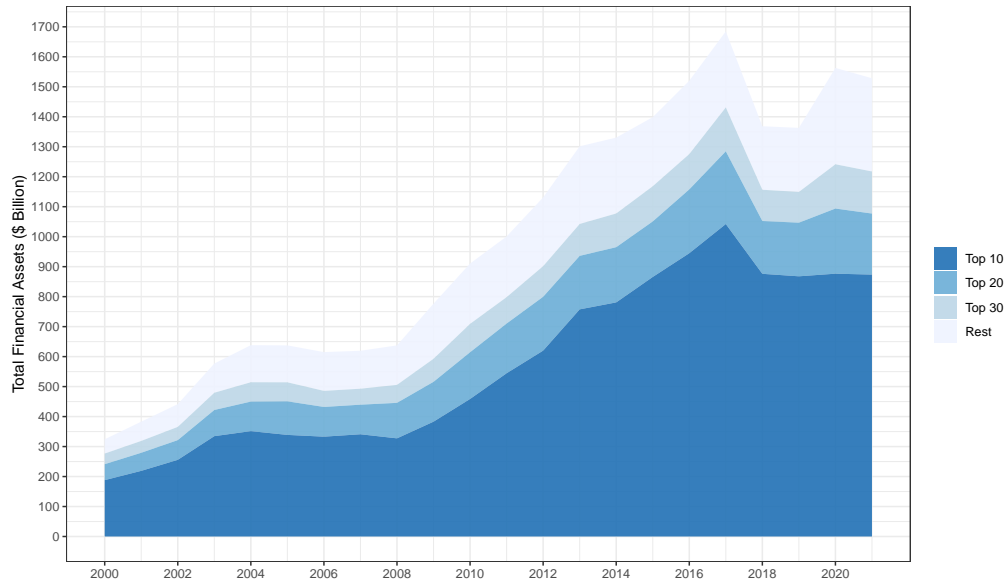
(a) Credit Constraints



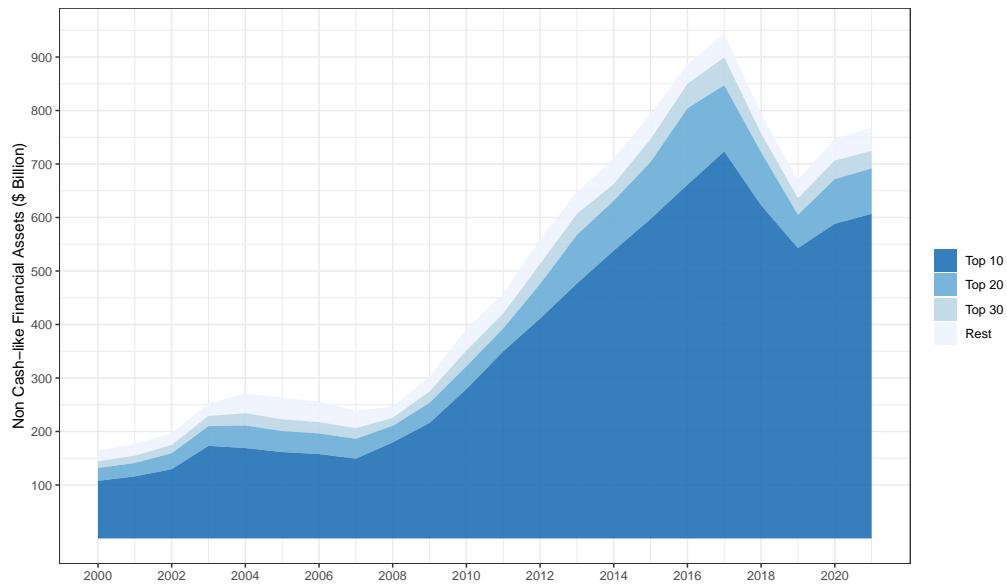
(b) Intangibles

Figure A.2 – Bi-variate Correlations with Firm Characteristics

This figure plots the bi-variate correlations with firm characteristics in our sample, using deciles for the x-axis. Panel (a) examines four proxies of credit constraints: ROA (EBITDA/lagged assets), ROE (net income/lagged book equity), the sum of dividends and share repurchases relative to EBITDA, and credit spreads. Panel (b) examines four proxies of intangibles: PP&E, CAPEX, and R&D relative to total assets, and book to market ratio. "Cash-like" is defined as the sum of cash, MMF, deposits, and commercial paper if this information is reported, and "cash and cash equivalents" otherwise.



(a) Total Financial Assets



(b) Non-Cash Financial Assets

Figure A.3 – Concentration in Financial Assets

This figure plots the concentration in financial assets in our sample. In panel (a), firms are sorted by total financial assets in each year. In panel (b), firms are sorted by non-cash financial assets in each year. "Cash-like" is defined as the sum of cash, MMF, deposits, commercial paper if this information is reported, and "cash and cash equivalents" otherwise.

Rank	Name	Financial Assets	Non Cash-like	Cash-like	Sector	Total Assets	Mkt Cap
1	APPLE INC	269	245	24	tech	375	790
2	MICROSOFT CORP	137	132	5	tech	241	531
3	ALPHABET INC	102	93	9	tech	197	732
4	CISCO SYSTEMS INC	70	58	13	tech	130	157
5	ORACLE CORP	67	44	23	tech	137	187
6	ATT INC	53	2	50	other	444	239
7	AMGEN INC	42	38	4	pharma	80	126
8	META PLATFORMS INC	42	34	8	tech	85	513
9	FORD MOTOR CO	39	23	16	other	258	50
10	QUALCOMM INC	39	4	35	tech	65	76
11	GILEAD SCIENCES INC	37	25	12	pharma	70	94
12	AMAZON.COM INC	32	11	21	tech	131	566
13	PEPSICO INC	25	15	11	other	80	170
14	GENERAL MOTORS CO	24	14	10	other	212	57
15	INTEL CORP	22	15	7	tech	123	216
16	MERCK CO	21	15	6	pharma	88	152
17	COCA-COLA CO	21	15	6	other	88	195
18	PFIZER INC	20	17	3	pharma	172	217
19	JOHNSON JOHNSON	18	6	12	pharma	157	375
20	BOOKING HOLDINGS INC	18	15	3	tech	25	84

Table A.1 – The Top 20 Firms by Largest Financial Assets in 2017

This table reports the largest holders of financial assets in 2017 in our sample. "Cash-like" is defined as the sum of cash, MMF, deposits, and commercial paper if this information is reported, and "cash and cash equivalents" otherwise.

	<i>Dependent variable:</i>					
	FA/AT	Cash-like/AT industry FE	Marketable Securities/AT	FA/AT	Cash-like/AT industry & year FE	Marketable Securities/AT
	(1)	(2)	(3)	(4)	(5)	(6)
Ln(firm sales)	-0.895*** (0.220)	-0.719*** (0.133)	-0.177 (0.193)	-1.086*** (0.227)	-0.909*** (0.137)	-0.178 (0.199)
Bond rating BBB or below	-3.250*** (0.538)	-1.613*** (0.326)	-1.637*** (0.471)	-3.326*** (0.539)	-1.668*** (0.324)	-1.658*** (0.473)
PPE to book assets(%)	-0.052*** (0.007)	-0.018*** (0.004)	-0.034*** (0.006)	-0.052*** (0.007)	-0.018*** (0.004)	-0.034*** (0.006)
Return on assets(%)	0.136*** (0.027)	0.011 (0.016)	0.125*** (0.023)	0.147*** (0.027)	0.016 (0.016)	0.132*** (0.024)
Return on equity(%)	0.001 (0.001)	0.001** (0.001)	0.00002 (0.001)	0.001 (0.001)	0.001* (0.001)	0.00001 (0.001)
Vol(ln(sales))	7.039*** (1.816)	1.629 (1.099)	5.410*** (1.588)	7.183*** (1.817)	1.831* (1.092)	5.352*** (1.595)
Payouts/lagged assets(%)	-0.053*** (0.009)	-0.056*** (0.005)	0.003 (0.008)	-0.053*** (0.009)	-0.056*** (0.005)	0.003 (0.008)
R&D to sales(%)	0.476*** (0.034)	0.095*** (0.021)	0.381*** (0.030)	0.476*** (0.034)	0.092*** (0.020)	0.384*** (0.030)
Book to market(%)	-0.050*** (0.008)	-0.026*** (0.005)	-0.024*** (0.007)	-0.048*** (0.008)	-0.027*** (0.005)	-0.021*** (0.007)
Book leverage(%)	-0.078*** (0.018)	-0.016 (0.011)	-0.063*** (0.015)	-0.088*** (0.018)	-0.023** (0.011)	-0.066*** (0.016)
Capital Exp/sales(%)	0.001 (0.001)	0.001** (0.0003)	-0.0001 (0.0005)	0.001 (0.001)	0.001** (0.0003)	-0.00004 (0.0005)
Observations	2,463	2,463	2,463	2,463	2,463	2,463
R ²	0.513	0.268	0.394	0.519	0.287	0.397
Adjusted R ²	0.509	0.262	0.389	0.512	0.277	0.389

Note:

*p<0.1; **p<0.05; ***p<0.01

Table A.2 – Financial Assets and Firm Characteristics: Panel Regressions

This table displays the estimated coefficient of regressing the components of financial assets on a set of firm characteristics. Only data from 2002 to 2017 in our sample are included in the regressions. "Cash-like" is defined as the sum of cash, MMF, deposits, and commercial paper if this information is reported, and "cash and cash equivalents" otherwise. "Marketable securities" are non-cash-like financial assets. "Payouts" are the sum of dividends and net equity repurchases. "return on assets" is EBITDA/lagged assets and "return on equity" is net income/lagged book equity, all from Compustat. Column (1) to (3) includes fixed effects for the twelve Fama-French industries. Column (4) to (6) contains both industry and year fixed effects. Standard errors are in parenthesis.

Table A.3 – Firms and Industry Classifications

Firm name	CIK	Valid years in sample	Tech/Pharma/Other	Most recent Fama French sector	SIC code
3M CO	0000066740	2000-2021	other	Manuf	2670.00
ABBOTT LABORATORIES	0000001800	2000-2021	pharma	Hlth	3845.00
ABBVIE INC	0001551152	2010-2021	pharma	Hlth	2836.00
ADELPHIA COMMUN -CL A	0000796486	2000-2005	other	Telcm	4841.00
ALBERTSON'S INC	0000003333	2000-2005	other	Shops	5411.00
ALPHABET INC	0001652044	2002-2021	tech	BusEq	7370.00
ALTICE USA INC	0001702780	2000-2021	other	Telcm	4841.00
ALTRIA GROUP INC	0000764180	2000-2021	other	NoDur	2111.00
AMAZON.COM INC	0001018724	2000-2021	tech	Shops	5961.00
AMERICAN AIRLINES GROUP INC	0000006201	2000-2010, 2013-2021	other	Others	4512.00
AMERISOURCEBERGEN CORP	0001140859	2000-2021	pharma	Shops	5122.00
AMGEN INC	0000318154	2000-2021	pharma	Hlth	2836.00
ANADARKO PETROLEUM CORP	0000773910	2000-2018	other	Ergny	1311.00
ANALOG DEVICES INC	0000006281	2000-2021	tech	BusEq	3674.00
ANDEAVOR	0000050104	2000-2017	other	Ergny	2911.00
APA CORP	0001841666	2000-2021	other	Ergny	1311.00
APPLE INC	0000320193	2000-2021	tech	BusEq	3663.00
APTIV PLC	0001521332	2000-2019	other	Durbl	3714.00
ARCHER-DANIELS-MIDLAND CO	0000007084	2000-2021	other	NoDur	2070.00
AT&T CORP	0000005907	2000-2004	other	Telcm	4813.00
AT&T INC	0000732717	2000-2021	other	Telcm	4812.00
AT&T WIRELESS SERVICES INC	0001138234	2000-2003	other	Telcm	4812.00
AUTOMATIC DATA PROCESSING	0000008670	2000-2021	tech	BusEq	7374.00
BAKER HUGHES CO	0001701605	2017-2021	other	Ergny	1389.00
BECTON DICKINSON & CO	0000010795	2000-2021	pharma	Hlth	3841.00
BELLSOUTH CORP	0000732713	2000-2005	other	Telcm	4813.00
BEST BUY CO INC	0000764478	2000-2021	other	Shops	5731.00
BIOGEN INC	0000875045	2000-2021	pharma	Hlth	2836.00
BOEING CO	0000012927	2000-2021	other	Manuf	3721.00
BOOKING HOLDINGS INC	0001075531	2000-2021	tech	BusEq	7370.00
BOSTON SCIENTIFIC CORP	0000885725	2000-2021	pharma	Hlth	3845.00
BRISTOL-MYERS SQUIBB CO	0000014272	2000-2021	pharma	Hlth	2834.00
BROADCOM INC	0001730168	2008-2021	tech	BusEq	3674.00
BURLINGTON NORTHERN SANTA FE	0000934612	2000-2019	other	Others	4011.00
CAESARS ENTERTAINMENT CORP	0000858339	2000-2007, 2012-2019	other	Others	7990.00
CARDINAL HEALTH INC	0000721371	2000-2021	pharma	Shops	5122.00
CATERPILLAR INC	0000018230	2000-2021	other	Manuf	3531.00
CELGENE CORP	0000816284	2000-2018	pharma	Hlth	2834.00
CHARTER COMMUNICATIONS INC	0001091667	2000-2008, 2010-2021	other	Telcm	4841.00
CHENIERE ENERGY INC	0000003570	2000-2009, 2017-2021	other	Ergny	1311.00
CHESAPEAKE ENERGY CORP	0000895126	2000-2021	other	Ergny	1311.00
CHEVRON CORP	0000093410	2000-2021	other	Ergny	2911.00
CISCO SYSTEMS INC	0000858877	2000-2021	tech	BusEq	3576.00
COCA-COLA CO	0000021344	2000-2021	other	NoDur	2086.00
COCA-COLA EUROPACIFIC PARTNE	0001650107	2000-2019	other	NoDur	2086.00
COMCAST CORP	0001166691	2000-2021	other	Telcm	4841.00
COMPAQ COMPUTER CORP	0000714154	2000-2001	tech	BusEq	3571.00
CONAGRA BRANDS INC	0000023217	2000-2019	other	NoDur	2000.00
CONOCO INC	0001066806	2000-2001	other	Ergny	2911.00
CONOCOPHILLIPS	0001163165	2000-2021	other	Ergny	1311.00
CONSTELLATION BRANDS	0000016918	2000-2021	other	NoDur	2082.00
CORNING INC	0000024741	2000-2021	tech	BusEq	3679.00
COSTCO WHOLESALE CORP	0000909832	2000-2021	other	Shops	5399.00
COTY INC	0001024305	2011-2021	other	Chems	2844.00
COX COMMUNICATIONS INC	0000025305	2000-2005	other	Telcm	4841.00
CSX CORP	0000277948	2000-2021	other	Others	4011.00
CVS HEALTH CORP	0000064803	2000-2021	other	Hlth	8000.00
DANAHER CORP	0000313616	2000-2021	other	BusEq	3826.00
DEERE & CO	0000315189	2000-2021	other	Manuf	3523.00
DELL TECHNOLOGIES INC	0001571996	2000-2012, 2018-2021	tech	BusEq	3571.00
DELTA AIR LINES INC	0000027904	2000-2004, 2007-2021	other	Others	4512.00
DEVON ENERGY CORP	0001090012	2000-2021	other	Ergny	1311.00
DIRECTV	0001465112	2000-2014	other	Telcm	4841.00
DISH NETWORK CORP	0001001082	2000-2021	other	Telcm	4841.00
DISNEY (WALT) CO	0001744489	2000-2021	other	Telcm	4888.00
DU PONT (E I) DE NEMOURS	0000030554	2000-2016	other	Chems	2820.00

DUPONT DE NEMOURS INC	0001666700	2000-2021	other	Chems	2860.00
DXC TECHNOLOGY CO	0001688568	2000-2021	tech	BusEq	7370.00
DYNEGY INC	0001379895	2000-2010	other	Enrgy	1311.00
EBAY INC	0001065088	2000-2021	tech	BusEq	7370.00
EMC CORP/MA	0000790070	2000-2015	tech	BusEq	3572.00
EMERSON ELECTRIC CO	0000032604	2000-2021	other	BusEq	3823.00
ENRON CORP	0001024401	2000	other	Shops	5172.00
EOG RESOURCES INC	0000821189	2000-2021	other	Enrgy	1311.00
EXPRESS SCRIPTS HOLDING CO	0001532063	2013-2017	pharma	Shops	5912.00
EXXON MOBIL CORP	0000034088	2000-2021	other	Enrgy	2911.00
FEDEX CORP	0001048911	2000-2019	other	Others	4513.00
FIDELITY NATIONAL INFO SVCS	0001136893	2003-2021	tech	BusEq	7374.00
FORD MOTOR CO	0000037996	2000-2021	other	Durbl	3711.00
FOX ENTERTAINMENT GROUP INC	0001068002	2000-2004	other	Telcm	4833.00
FREEPOR-T-MCMORAN INC	0000831259	2000-2021	other	Others	1000.00
FRONTIER COMMUNIC PARENT INC	0000020520	2000-2021	other	Telcm	4813.00
GENERAL DYNAMICS CORP	0000040533	2000-2021	other	Manuf	3721.00
GENERAL MILLS INC	0000040704	2000-2019	other	NoDur	2040.00
GENERAL MOTORS CO	0001467858	2000-2008, 2010-2021	other	Durbl	3711.00
GEORGIA-PACIFIC CORP	0000041077	2000-2004	other	Manuf	2600.00
GILEAD SCIENCES INC	0000882095	2000-2021	pharma	Hlth	2836.00
HALLIBURTON CO	0000045012	2000-2021	other	Enrgy	1389.00
HCA HEALTHCARE INC	0000860730	2000-2005, 2011-2021	pharma	Hlth	8062.00
HESS CORP	0000004447	2000-2021	other	Enrgy	1311.00
HEWLETT PACKARD ENTERPRISE	0001645590	2013-2021	tech	BusEq	3571.00
HOME DEPOT INC	0000354950	2000-2021	other	Shops	5211.00
HONEYWELL INTERNATIONAL INC	0000773840	2000-2015	tech	BusEq	3822.00
HP INC	0000047217	2000-2021	tech	BusEq	3570.00
IHEARTMEDIA INC	0001400891	2000-2007, 2021	other	Telcm	4832.00
INTEL CORP	0000050863	2000-2021	tech	BusEq	3674.00
INTL BUSINESS MACHINES CORP	0000051143	2000-2021	tech	BusEq	7370.00
INTL PAPER CO	0000051434	2000-2021	other	Manuf	2631.00
IQVIA HOLDINGS INC	0001478242	2011-2021	tech	Others	8731.00
JOHNSON & JOHNSON	0000200406	2000-2021	pharma	Hlth	2834.00
JOHNSON CONTROLS INTL PLC	0000833444	2000-2019	other	Manuf	3585.00
KIMBERLY-CLARK CORP	0000055785	2000-2021	other	Manuf	2621.00
KRAFT HEINZ CO	0001637459	2000-2012, 2015-2021	other	NoDur	2030.00
KROGER CO	0000056873	2000-2021	other	Shops	5411.00
LAS VEGAS SANDS CORP	0001300514	2002-2021	other	Others	7990.00
LEVEL 3 COMMUNICATIONS INC	0000794323	2000-2016	tech	Telcm	4813.00
LIBERTY EXPEDIA HOLDINGS INC	0001669600	2014-2018	tech	Others	4700.00
LIBERTY GLOBAL PLC	0001570585	2002-2019	other	Telcm	4841.00
LILLY (ELI) & CO	0000059478	2000-2021	pharma	Hlth	2834.00
LOCKHEED MARTIN CORP	0000936468	2000-2021	other	Manuf	3760.00
LOWE'S COS INC	0000060667	2000-2021	other	Shops	5211.00
LUCENT TECHNOLOGIES INC	0001006240	2000-2006	other	BusEq	7373.00
LUMEN TECHNOLOGIES INC	0000018926	2000-2021	other	Telcm	4813.00
MACY'S INC	0000794367	2000-2021	other	Shops	5311.00
MARATHON OIL CORP	0000101778	2000-2021	other	Enrgy	1311.00
MARATHON PETROLEUM CORP	0001510295	2009-2021	other	Enrgy	2911.00
MARRIOTT INTL INC	0001048286	2000-2021	other	Others	7011.00
MCDONALD'S CORP	0000063908	2000-2021	other	Shops	5812.00
MCI INC	0000723527	2000-2001, 2004	other	Telcm	4813.00
MCKESSON CORP	0000927653	2000-2021	pharma	Shops	5122.00
MEDTRONIC PLC	0001613103	2000-2019	pharma	Hlth	3845.00
MERCK & CO	0000310158	2000-2021	pharma	Hlth	2834.00
META PLATFORMS INC	0001326801	2010-2021	tech	BusEq	7370.00
MGM RESORTS INTERNATIONAL	0000789570	2000-2021	other	Others	7990.00
MICRON TECHNOLOGY INC	0000723125	2000-2021	tech	BusEq	3674.00
MICROSOFT CORP	0000789019	2000-2021	tech	BusEq	7372.00
MOLSON COORS BEVERAGE CO	0000024545	2000-2021	other	NoDur	2082.00
MONDELEZ INTERNATIONAL INC	0001103982	2000-2021	other	NoDur	2052.00
MONSANTO CO	0001110783	2000-2017	other	NoDur	100.00
MOTOROLA SOLUTIONS INC	0000068505	2000-2021	tech	BusEq	3663.00
NEWELL BRANDS INC	0000814453	2000-2021	other	Durbl	3990.00
NEWMONT CORP	0001164727	2000-2021	other	Others	1040.00
NEXTEL COMMUNICATIONS INC	0000824169	2000-2004	other	Telcm	4812.00
NIKE INC -CL B	0000320187	2000-2019	other	Manuf	3021.00
NOBLE ENERGY INC	0000072207	2000-2019	other	Enrgy	1311.00
NORFOLK SOUTHERN CORP	0000702165	2000-2021	other	Others	4011.00
NORTHROP GRUMMAN CORP	0001133421	2000-2021	tech	BusEq	3812.00

NOV INC	0001021860	2000-2021	other	Manuf	3533.00
OCCIDENTAL PETROLEUM CORP	0000797468	2000-2021	other	Enrgy	1311.00
OLD COPPER CO INC	0001166126	2000-2019	other	Shops	5311.00
OMNICOM GROUP INC	0000029989	2000-2021	other	Others	7311.00
ORACLE CORP	0001341439	2000-2019	tech	BusEq	7370.00
PACCAR INC	0000075362	2000-2021	other	Durbl	3711.00
PARAMOUNT GLOBAL	0000813828	2000-2021	other	Telcm	4888.00
PAYPAL HOLDINGS INC	0001633917	2013-2021	tech	BusEq	7374.00
PEPSICO INC	0000077476	2000-2021	other	NoDur	2080.00
PFIZER INC	0000078003	2000-2021	pharma	Hlth	2834.00
PHARMACIA CORP	0000067686	2000-2002	pharma	Hlth	2834.00
PHILIP MORRIS INTERNATIONAL	0001413329	2006-2021	other	NoDur	2111.00
PHILLIPS 66	0001534701	2012-2021	other	Enrgy	2911.00
PROCTER & GAMBLE CO	0000080424	2000-2021	other	Chems	2840.00
QUALCOMM INC	0000804328	2000-2021	tech	BusEq	3674.00
QWEST COMMUNICATION INTL INC	0001037949	2000-2010	other	Telcm	4813.00
RAYTHEON CO	0001047122	2000-2019	tech	BusEq	3812.00
RAYTHEON TECHNOLOGIES CORP	0000101829	2000-2021	other	Manuf	3724.00
REYNOLDS AMERICAN INC	0001275283	2000-2016	other	NoDur	2111.00
SAFEWAY INC	0000086144	2000-2013	other	Shops	5411.00
SALESFORCE INC	0001108524	2002-2021	tech	BusEq	7372.00
SEARS HOLDINGS CORP	0001310067	2000-2001, 2003-2017	other	Shops	5311.00
SEARS ROEBUCK & CO	0000319256	2000-2004	other	Shops	5311.00
SHERWIN-WILLIAMS CO	0000089800	2000-2021	other	Chems	2851.00
SOUTHWEST AIRLINES	0000092380	2000-2021	other	Others	4512.00
SPECTRUM BRND HLDG INC	0000109177	2000-2005, 2011-2021	other	Durbl	3634.00
SPRINT CORP	0000101830	2000-2018	other	Telcm	4812.00
STARZ	0001507934	2000-2015	other	Telcm	4833.00
STRYKER CORP	0000310764	2000-2021	other	Hlth	3842.00
T-MOBILE US INC	0001283699	2013-2021	other	Telcm	4812.00
TARGET CORP	0000027419	2000-2021	other	Shops	5331.00
TEMPLE-INLAND INC	0000731939	2000-2010	other	Manuf	2631.00
TENET HEALTHCARE CORP	0000070318	2000-2021	other	Hlth	8062.00
TESLA INC	0001318605	2008-2021	other	Durbl	3711.00
TEXACO INC	0000097349	2000	other	Enrgy	2911.00
TEXAS INSTRUMENTS INC	0000097476	2000-2021	tech	BusEq	3674.00
THERMO FISHER SCIENTIFIC INC	0000097745	2000-2021	tech	BusEq	3826.00
TIME WARNER CABLE INC	0001377013	2006-2015	other	Telcm	4841.00
TIME WARNER INC	0001105705	2000-2017	other	Telcm	4888.00
TRIBUNE MEDIA CO	0000726513	2000-2006, 2014-2018	other	Telcm	4833.00
TRW INC	0000100030	2000-2001	other	Durbl	3714.00
TWENTY-FIRST CENTURY FOX INC	0001308161	2000-2018	other	Telcm	4888.00
TYSON FOODS INC -CL A	0000100493	2000-2021	other	NoDur	2011.00
UNION PACIFIC CORP	0000100885	2000-2021	other	Others	4011.00
UNITED AIRLINES HOLDINGS INC	0000100517	2000-2002, 2006-2021	other	Others	4512.00
UNITED PARCEL SERVICE INC	0001090727	2000-2021	other	Others	4210.00
VALERO ENERGY CORP	0001035002	2000-2021	other	Enrgy	2911.00
VERISIGN INC	0001014473	2000-2021	tech	BusEq	7370.00
VERIZON COMMUNICATIONS INC	0000732712	2000-2021	other	Telcm	4812.00
VIACOM INC	0001339947	2004-2019	other	Telcm	4833.00
VIAVI SOLUTIONS INC	0000912093	2000-2021	tech	BusEq	3576.00
VMWARE INC -CL A	0001124610	2005-2021	tech	BusEq	7373.00
WALGREENS BOOTS ALLIANCE INC	0001618921	2000-2021	other	Shops	5912.00
WALMART INC	0000104169	2000-2021	other	Shops	5331.00
WARNER BROS DISCOVERY INC	0001437107	2003-2021	other	Telcm	4841.00
WESTERN DIGITAL CORP	0000106040	2000-2021	tech	BusEq	3572.00
WESTROCK CO	0001732845	2000-2021	other	Manuf	2650.00
WEYERHAEUSER CO	0000106535	2000-2019	other	Others	2400.00
WHIRLPOOL CORP	0000106640	2000-2021	other	Durbl	3630.00
WYETH	0000005187	2000-2008	pharma	Hlth	2834.00
XEROX HOLDINGS CORP	0001770450	2000-2021	tech	BusEq	3577.00
XTO ENERGY INC	0000868809	2000-2006, 2008-2009	other	Enrgy	1311.00
ZIMMER BIOMET HOLDINGS INC	0001136869	2001-2021	other	Hlth	3842.00