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Short-Termism, Shareholder Payouts, and Investment in the EU

Law Working Paper N° 544/2020
February 2021

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Abstract

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Keywords: short-termism; EU; payout policy; investment; innovation

JEL Classifications: G15, G32, G35, G38, O52

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Abstract

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> "The last years have shown time and time again how short-termism damages European companies and the economy."
>
> — Michael Barnier, European Commissioner for Internal Markets (2014)

1 Introduction

In both the US and the EU, shareholder-driven "short-termism" (or "quarterly capitalism") is said to be a critical problem for public firms and the economy.[1] While these claims have been greeted skeptically by many academics,[2] those eager to find evidence of short-termism in the US claim to have found a "smoking gun": increasingly large cash payouts to shareholders through share repurchases and dividends. The leading exponent of this view is economist William Lazonick, who has argued that the high ratio of such payouts to net income, typically exceeding 90% in the US, impairs firms' ability to invest, innovate, and provide good wages (Lazonick, 2014).

The high ratio of shareholder payouts to net income has been cited by other economists (Kahle and Stulz, 2017) as evidence that US public firms have limited opportunities or incentive to invest, and by asset managers (Fink, 2015), leading corporate lawyers (Lipton, 2015), and senior politicians (Biden, 2016) as evidence that market pressures deprive firms of the capital needed for long-term investment. Senator Elizabeth Warren cited such payout-ratio figures as justification for her proposed Accountable Capitalism Act (Office of Elizabeth Warren, 2018).

In prior work, we explained that these widely-cited shareholder-payout figures are incomplete and misleading for two main reasons (Fried and Wang, 2019).[3] First, shareholder payouts tell only half the story of capital movements between firms and shareholders: they fail to account for direct

[1] In the US, such claims have been made by academics (Bratton and Wachter, 2010; Coffee and Palia, 2015), corporate lawyers (Lipton, 2015), Delaware judges (Strine, 2010), and think tanks (Aspen Institute, 2009). In the EU, such claims have been made by prominent European business executives (Ralph, 2016), lawyers (Gregor and Bold, 2017), EU officials (EU Commission Press, 2020; Brooksbank, 2014), EU agencies (European Securities and Makets Authority (ESMA), 2019), accounting firms (Ernst & Young, 2020), and academics (Sakinc, 2017).

[2] A number of leading academics have forcefully argued that activist shareholders play a useful role in the market ecosystem (Bebchuk and Jackson, 2012; Gilson and Gordon, 2013; Kahan and Rock, 2007) and that concerns over short-termism are greatly exaggerated (Bebchuk, 2013; Roe, 2013; Kaplan, 2017; Roe, 2018). While market pressures can induce executives to act in ways that boost the short-term stock price at the expense of long-term value (Bushee, 1998; Dichev et al., 2013; Graham et al., 2006) and may undesirably reduce investment at public firms (Asker et al., 2015), these costs must be weighed against the potential reduction in agency costs created by greater director accountability to shareholders. One prominent study finds evidence of such benefits, reporting that shareholder activism increases the stock price at targeted firms in both the short term and the long term (Bebchuk et al., 2015). For an argument that systemic problems driven by short-termism are not present in the EU, see Strand (2015).

[3] An earlier version of the work, written for a broader audience, was published in the *Harvard Business Review* (Fried and Wang, 2018).

and indirect equity capital inflows through share issuances by firms raising cash, paying employees, and acquiring assets. These inflows are substantial. For example, during 2007-2016, S&P 500 firms distributed to shareholders more than $7 trillion through stock buybacks and dividends, representing 96% of these firms' net income during that decade. But during this same period, S&P 500 firms absorbed, directly or indirectly, $3.3 trillion of equity capital through share issuances. *Net* shareholder payouts from S&P 500 firms were therefore only about $3.7 trillion, or 50% of these firms' net income.

Second, the focus on shareholder payouts as a percentage of net income wrongly implies that "net income" reflects the totality of a firm's resources that are generated from its business operations and are available for investment. In fact, net income is calculated by subtracting the many costs associated with future-oriented activities that can be expensed (such as R&D). Indeed, a firm that spends more on R&D will, everything else equal, have a *lower* net income and a *higher* shareholder-payout ratio. For income available for investment, a better measure is *R&D-adjusted* net income (i.e., net income plus R&D expenditures net of taxes). Across all US public firms, *net* shareholder payouts constituted only about 33% of *R&D-adjusted* net income during 2007-2016. This left trillions of dollars for investment, much of which was in fact used for that purpose. Thus, the public-firm shareholder payout figures cited by Lazonick fail to indicate a short-termism problem in the US.

Unfortunately, misleading Lazonick-inspired shareholder-payout figures are now being offered as evidence of short-termism in Europe, including by an accounting firm hired to provide a report on short-termism to the European Commission (Ernst & Young, 2020). In this paper, we use the analytical framework of Fried and Wang (2019) to provide EU policymakers and academics with a more accurate picture of capital flows and investment levels in EU public firms, focusing on the period 1992-2019 (the period examined by Ernst & Young (2020)) as well as on the last decade (2010-2019), when shareholder activism and concerns about short-termism in the EU have become more widespread. In short, we find little basis for concern.

We find that during 1992-2019 listed EU firms distributed to shareholders more than €676

billion through stock buybacks and €2.5 trillion through dividends.[4] These cash outflows, which totaled €3.2 trillion, represented 58% of these firms' net income during this period. But during this same period, listed EU firms absorbed, directly or indirectly, €2.5 trillion of equity capital from shareholders through share issuances, far exceeding repurchases. We show that *net* shareholder payouts from listed EU firms during 1992-2019 were only about €744 billion, or 13% of these firms' net income over this period.[5] For 2010-2019, the figure was 36%, somewhat lower than the 50% figure for the US S&P 500 during 2007-2016, but very similar to the 41% for all US public firms during that period (Fried and Wang, 2019). We also show that smaller EU public firms, like smaller US public firms (Fried and Wang, 2019), were net importers of equity capital during almost every year in our almost 30-year sample period: their equity issuances exceeded dividends plus repurchases.

We then examine net shareholder payouts as a percentage of R&D-adjusted net income. For the most recent decade (2010-2019), the figure was 28%, slightly lower than the 33% reported for all US public firms during 2007-2016 (Fried and Wang, 2019). We also show that during 1992-2019 EU public firms generated €6.3 trillion of investment-available income (the difference between R&D-adjusted net income and net shareholder payouts), €2.7 trillion of which was generated in the most recent decade.

To understand how this investment-available income was deployed, we consider the level and intensity of investment at EU public firms, as well as their cash balances. Using various investment measures, we find that investment levels and overall investment intensity increased over the period and have been relatively stable or increasing over the last 20 years (when data have been more reliable). Over 2010-2019, investment levels continued to increase while investment intensity remained stable. Notably, R&D levels increased by 60% and R&D intensity increased by about 30%, reaching the highest intensity levels observed over the last three decades and more than offsetting the decline in CAPEX intensity during 2010-2019. Moreover, during 1992-2019 cash balances jumped sevenfold from €132 billion to €973 billion, and they grew by nearly 40% over the last

[4] As we will explain, a fraction of what is reported as dividends by EU firms actually consists of equity, not cash. For simplicity, we assume that dividends are paid 100% in cash and treat this equity as a component of total equity issuances. Thus, dividends and equity issuances are each overstated by the same amount, leaving net shareholder payouts unaffected.

[5] This figure is exceedingly low because net shareholder payouts were negative and often highly negative during all but one year during 1992-2002, as firms absorbed much more equity capital than they distributed, an obviously unsustainable investment equilibrium.

decade. Overall, these findings are inconsistent with the hypothesis that short-term pressures are systematically draining EU firms of the capacity to invest and innovate. Instead, they suggest that the limiting factor on investment is a lack of opportunity, not a lack of cash.

Looking beyond public-firm data, we offer two other observations about why shareholder payouts by public firms are unlikely to pose a problem for the EU economy. First, actual net shareholder payout data understates investment capacity because a public firm that needs more equity capital can simply issue more shares; there is no limit on additional equity issuances, as long as the firm secures any needed shareholder approval. Second, net shareholder payouts are not wasted from a societal investment or innovation perspective, as return-seeking investors recycle them into other firms. Just as smaller EU public firms are net capital absorbers, so are most EU private firms, and net shareholder payouts by large public firms can be used to supply both small public firms and private firms with needed funds.

While we cannot rule out the possibility that short-termist pressures are causing some EU public firms to distribute too much cash to shareholders (or are generating other costs unrelated to capital flows), the level of dividends and share repurchases in the EU does not provide any evidence of short-termism.

The remainder of this paper proceeds as follows. Section 2 focuses on shareholder payouts from EU public firms: dividends plus repurchases. Section 3 provides estimates of equity issuances and net shareholder payouts for EU public firms. It also shows that smaller EU public firms are net importers of equity capital. Section 4 uses R&D-adjusted net income to explore the investment capacity of EU public firms. It then reports various measures of investment intensity and cash balances. Section 5 concludes.

2 Shareholder Payouts by EU Public Firms

We examine the amount of shareholder payouts—the sum of dividends and repurchases—by EU-headquartered firms during 1992-2019.

To compute shareholder payouts, we rely on data from Compustat Global's Daily Security file for all listed companies headquartered in each of the 27 EU countries. We estimate the total monthly

dividends paid by a firm (Dividends$_t$) by multiplying gross dividends per share (Compustat field *DIV*) by shares outstanding (Compustat field *CSHOC*) and summing over the firm's observations each year. This estimate includes both ordinary and special dividends.[6] For repurchases, we follow Boudoukh et al. (2007), combining the total dollar amounts spent on stock repurchases and removing the effect of repurchases of preferred shares.[7] To ensure the comparability of currency amounts, we use Compustat's exchange rates file to express all relevant nominal amounts (e.g., share price, dividends, repurchases, market capitalization, and investment variables) in Euros. Finally, all our computations are performed on each firm's "primary security" as identified by Compustat (e.g., excluding ADRs).

Our empirical analysis focuses on EU public firms (firms headquartered in a current EU member-state whose primary listing is on an exchange in the EU) for which we can obtain fundamentals and share price information over a given calendar year (i.e., 12 months of returns and an annual financial report) during 1992-2019. Thus, for any firm entering the public market (through an IPO) or exiting the public market (through a going-private transaction, bankruptcy, or other delisting events), we exclude equity-capital flows in the calendar year of such entrance or exit event.[8] Overall, our sample contains 68,787 firm-year observations covering 6,173 unique firms headquartered and traded in a country that is part of the EU as of 2020. Table 1 summarizes our full sample.[9]

Figure 1 (and columns 1-3 of Table 2) shows that during 1992-2019 EU public firms distributed €3.2 trillion back to shareholders: €676 billion through repurchases and €2.5 trillion through dividends. Similar to Sakinc (2017) and Ernst & Young (2020), we find that shareholder payouts have increased significantly over the last three decades.[10] But this increase is in large part due to the increasing number of firms covered by Compustat Global (e.g., data for 1992, 1993, and

[6] As noted earlier, a portion of what is reported as dividends by EU firms actually consists of equity (not cash), but for simplicity we assume dividends are 100% cash.

[7] Total share repurchases can be captured in two fields as defined by Compustat Global: *prstkc* (purchase of common shares) and *purtshr* (purchase of treasury shares). We sum values over these two fields and then deduct the decrease in the redemption value of preferred shares (*pstkrv*) to arrive at an estimate of stock repurchases.

[8] As explained in Fried and Wang (2019), capital inflows from the IPO of a firm's shares (and secondary offerings that same year) and firm-shareholder capital movement in the year a firm exits the market are often difficult to trace, and some shareholders of publicly-traded shares continue to own shares after exit (e.g., a controlling shareholder in a go-private transaction).

[9] We note that Compustat Global's coverage is less comprehensive in the early 1990s, with 500-800 firms covered each year from 1992 to 1994. Since the late 1990s, coverage is more comprehensive, with 2,000-3,500 firms per year in our sample.

[10] Like Sakinc (2017) and Ernst & Young (2020), our data are sourced from the S&P. Our data are from S&P's Compustat Global database whereas the main data of Sakinc (2017) and Ernst & Young (2020) are obtained from S&P's Capital IQ.

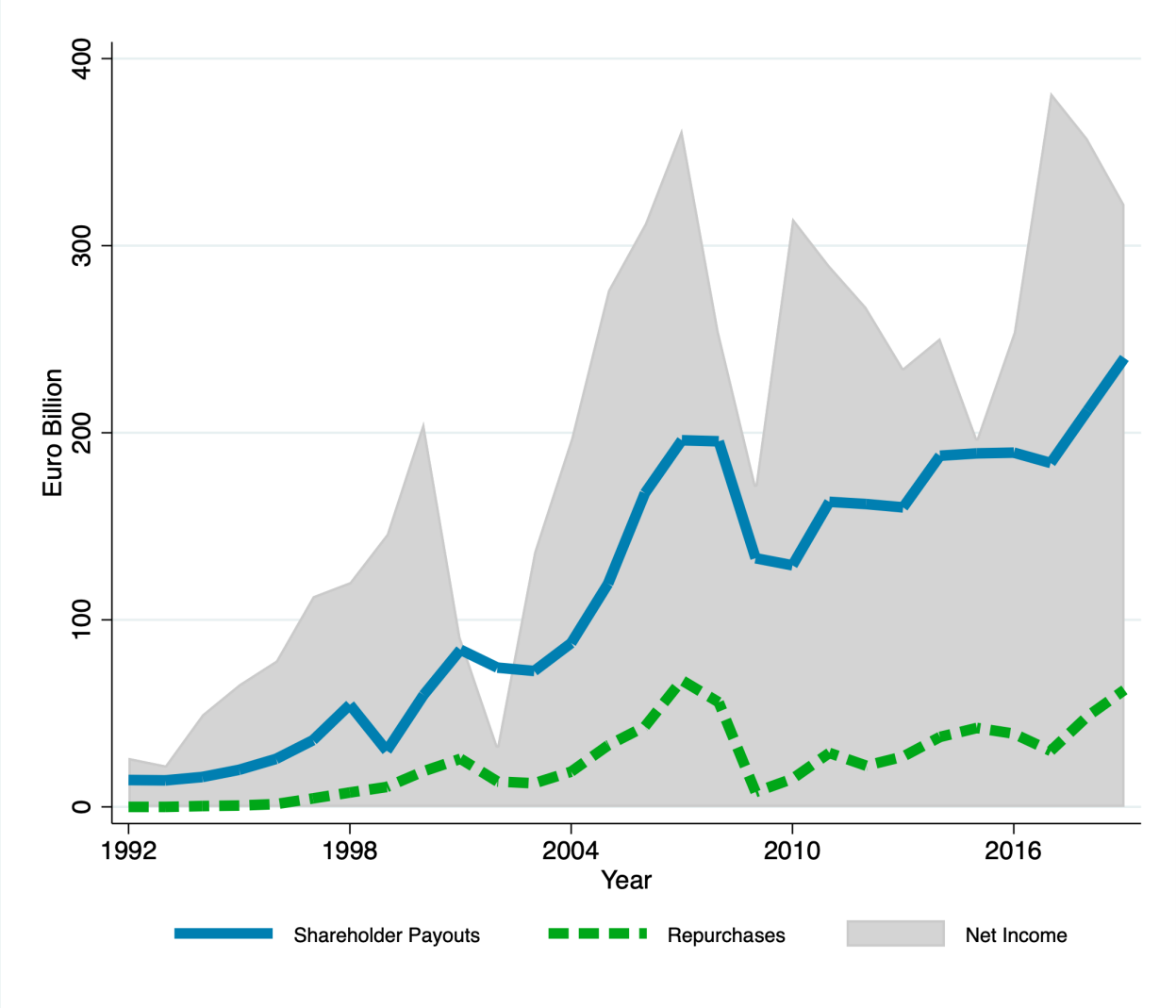

Figure 1: Shareholder Payouts by EU Public Firms (1992-2019). The solid line depicts the time series of total shareholder payouts (dividends + repurchases) among EU public firms. The dashed line and the gray background depict the time-series of aggregate repurchases and aggregate net income, respectively. Details of variable construction are presented in Table A1.

1994 reflect only 584, 724, and 797 firms, respectively, while data in the 2000s typically reflect 2,500-3,500 firms each year).

To mitigate potential problems from inconsistent coverage, Figure 2 displays the time-series trend of aggregate shareholder payouts as a percentage of aggregate net income and aggregate revenues. Overall, we see an upward trend, consistent with Sakinc (2017) and Ernst & Young (2020). During 1992-2019, 58% of the €5.5 trillion in cumulative net income generated by EU firms was distributed to shareholders through dividends and repurchases. Over the most recent decade (2010-2019), this figure was 63%, much less than the 96% reported for US S&P 500 firms

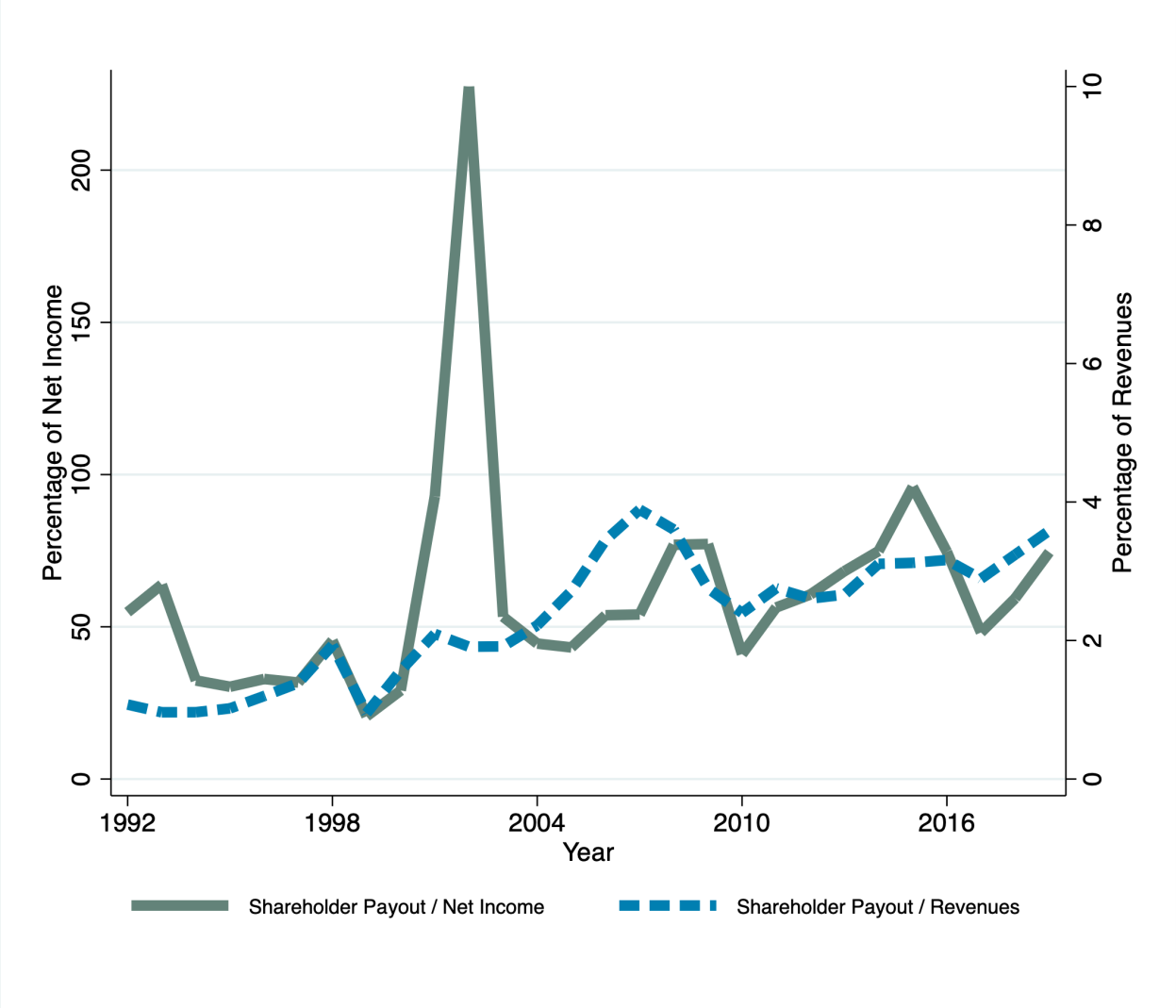

Figure 2: Shareholder Payouts by EU Public Firms as a Percentage of Net Income or Revenues (1992-2019). The solid line depicts the time series of total shareholder payouts (dividends + repurchases) among EU-headquartered firms divided by net income among the same firms. The dashed line depicts total shareholder payout among EU-headquartered firms divided by total revenues among the same firms. Details of variable construction are presented in Table A1.

during 2007-2016 (Fried and Wang, 2019).

3 Total Equity Issuances and Net Shareholder Payouts by EU Public Firms

We estimate total equity issuances and net shareholder payouts by EU public firms during 1992-2019 using the sample described in Section 2.

3.1 The Need to Properly Account for Equity Issuances

As explained in Fried and Wang (2019), the problem with using only share repurchases and dividends to capture capital flows between firms and shareholders is that it is based on a flawed assumption: that capital moves only from firms to shareholders. In fact, firms that have conducted an initial public offering (IPO) subsequently issue common shares to investors through both direct (cash-raising) equity issuances (e.g., at-the-market or seasoned equity offerings) and indirect equity issuances (e.g., grants of stock to employees, who later sell the stock to investors), which despite differences in form have economically identical effects on firms and their shareholders.

To include the effect of equity issuances, we should measure *net* shareholder payouts: dividends plus repurchases minus equity issuances or, equivalently, dividends minus net equity issuances (issuances minus repurchases). As explained in Fried and Wang (2019), net equity issuances are most accurately measured by recording changes in share count and multiplying those changes by the stock price, as this "share count" approach captures both direct and indirect equity issuances, the latter of which can be substantial.

As an example of why equity issuances must be taken into account, consider the software firm Dassault Systèmes. In 2017, Dassault paid out €134.5 million in total dividends and bought back €133 million of its stock.[11] The €267.5 million of shareholder payouts amounted to 51.5% of net income. However, Dassault also issued significant equity. Of the dividends, €83.2 million was paid in newly issued stock. Dassault also issued 2.9 million shares to employees (with a market value of €237.8 million).[12] As Fried and Wang (2019) explains, this is equivalent to the firm issuing equity directly to shareholders and paying the cash proceeds to employees.[13] Dassault's total equity issuances in 2017 were thus €321 million. So while dividends and shareholder repurchases totaled

[11] These buybacks include the amount repurchased through the company's stock buyback program (€127 million) and the net amount repurchased as a result of its liquidity agreement (€5 million), through which its shares are issued and repurchased in the open market to improve the liquidity of its shares.

[12] We calculate the market value using 2017's average share price of €82. Of the 2.9 million new shares, 1.9 million resulted from the exercise of employee stock options and 1 million from the vesting of performance shares.

[13] When the equity is received via the exercise of stock options, the transaction is equivalent to issuing the equity directly to shareholders and paying employees cash equal to the difference between the exercise price and the stock's trading price (Fried and Wang, 2019). Note that, under IFRS, the accounting for option exercises and stock grants do not capture the full amount of direct and indirect capital raised in these transactions. For example, the cash flow statement only captures the cash received by the company as a result of the exercise of stock options (strike price times the number of shares). Stock compensation, on the other hand, is expensed over the vesting period based on the grant-date fair value. In both cases, the accounting estimate is likely to differ significantly from the market value of the shares issued (i.e., when options are exercised or stock grants are fully vested).

51% of net income, *net* shareholder payouts were -€53.5 million, or -10% of net income. Dassault's shareholders actually contributed more cash to Dassault, directly or indirectly, than they received.

This example illustrates why focusing on gross shareholder payouts alone paints a misleading picture of capital flows between public firms and shareholders. As we have seen, issuances can sometimes offset or even exceed shareholder payouts. In many companies, such as Dassault, this is by design: part of the intended purpose of share buyback programs is to manage the dilution from share issuances stemming from scrip dividend programs, employee compensation, and acquisitions. To understand capital flows between firms and their shareholders, one must also take into account equity issuances (both direct and indirect).

3.2 Methodology

Following Fried and Wang (2019), we estimate *net* shareholder payouts for EU public firms by computing for each firm dividends paid and net equity issuances:

$$\text{Net Shareholder Payouts} \quad = \quad \text{Dividends} - \text{Net Equity Issuances} \tag{1}$$

where net equity issuances is defined as the amount of direct and indirect share issuances minus the amount of share repurchases. We estimate both dividends and net equity issuances on a monthly basis using the Compustat Global Daily Security file.

As in the prior analysis, monthly dividends paid by a firm (Dividends_t) is estimated by multiplying gross dividends per share (Compustat field *DIV*) by shares outstanding (Compustat field *CSHOC*) and summing over the firm's observations each month.[14] Monthly net equity issued by a firm ($\text{Net Equity Issuances}_t$) is estimated using the "share count" method following Fried and Wang (2019):

$$\text{Net Equity Issuances}_t = \Delta\text{Shares}_t \times \text{Average Stock Price}_t, \tag{2}$$

[14]Compustat Global Daily Security File's *DIV* field captures dividends per share, which includes both dividends paid in cash and dividends that investors elect to receive in the form of equity. Our Net Equity Issuance (Eq., 2) measure captures the additional shares paid in lieu of cash dividends. Thus, dividends and net equity issuances are each inflated by the same amount. However, because the latter is subtracted from the former to yield net shareholder payouts, net shareholder payouts are unaffected by these equity issuances. Thus we can treat all dividends as if they are cash. We do not include the field *cheqv*, which captures the distribution of cash-equivalent distributions such as rights issues. However, we verified that these transactions are fairly rare and thus do not materially change our analyses and inferences.

where ΔShares_t is the change in shares outstanding from the end of the prior month to the current month, and $\text{Average Stock Price}_t$ is the average daily stock price over the current month.[15] To make prices and shares outstanding comparable over the month, we follow the standard practice of adjusting them using Compustat's cumulative adjustment factors.[16] As before, to ensure the comparability of currency amounts, we use Compustat's daily exchange rates file to express all relevant nominal amounts—share price, dividends, and market capitalization—in Euros.

3.3 Total Equity Issuances and Net Shareholder Payouts by EU Public Firms

We first report the annual Euro volume of equity issuances by EU public firms during 1992-2019. We obtain the yearly volume of gross equity issuances by adding repurchases (from the Compustat Global Fundamentals Annual file) to net equity issuances (Eq. 2).

Figure 3 (and columns 5 and 6 of Table 2) shows issuance volumes for each year during 1992-2019, alongside repurchases and dividends. The volume of equity issuances was higher than the volume of share buybacks in each year. Over the entire period, the total volume of equity issuances totaled about €2.5 trillion, 265% more than total repurchases and 23% less than the €3.2 trillion in shareholder payouts during the same period.[17]

Because the volume of equity issuances is so large, *net* shareholder payouts (€744 billion) are much lower than (only about 23% of) shareholder payouts (€3.2 trillion). Figure 4 shows annual shareholder payouts and net shareholder payouts in EU public firms during 1992-2019, against a backdrop of net income. Across all years, the median net shareholder payout (as a percentage of shareholder payout) was 36%. In nine years (1992-1994 and 1996-2001), net shareholder payouts were negative: public equity investors provided EU firms with more capital than they took out. During 1992-2019, cumulative net shareholder payouts for EU firms were only 13% of cumulative net income, much less than the ratio of cumulative shareholder payouts to cumulative net income (58%). The ratio of cumulative net shareholder payouts to cumulative net income is exceedingly low because it includes almost an entire decade of negative net shareholder payouts. Obviously, this

[15] For an explanation for why this approach is conservative and will tend to over-estimate net shareholder payouts, see Fried and Wang (2019).

[16] Shares outstanding is computed as $cshoc_t \times ajexdi_t$, and stock price is given by $\frac{prccd_t}{ajexdi_t}$.

[17] Over the most recent decade (2010-2019), equity issuances totaled €771 billion, more than twice the €353 billion of share repurchases over the same period.

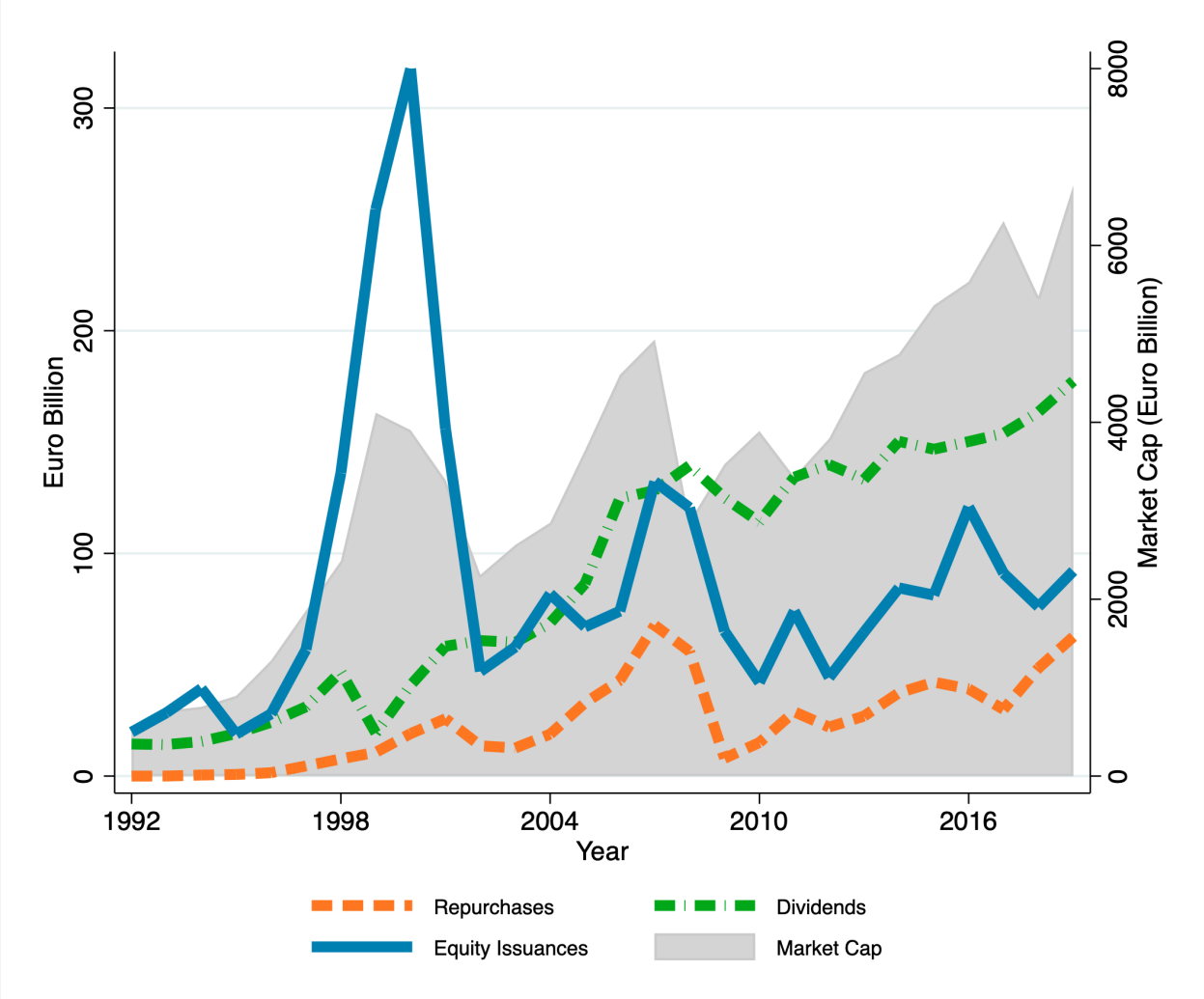

Figure 3: Repurchases, Dividends, and Equity Issuances by EU Public Firms (1992-2019) The solid line depicts the time series of repurchases among EU public firms, computed from Compustat as the purchase of common and preferred shares plus the purchase of treasury shares less any decrease in the value of preferred stock. Equity issuances are computed as the sum of net equity issuances and repurchases. Market capitalization, the gray background, is computed using calendar-year-end share and price data. Details of variable construction are presented in Table A1.

is an unsustainable investment equilibrium: investors would not buy shares unless they expected firms to distribute cash down the road.

It is thus not surprising that net shareholder payouts eventually turned positive. Over the most recent decade, the ratio of cumulative net shareholder payouts to cumulative net income was 36%, again significantly lower than the ratio of cumulative shareholder payouts to cumulative net income (63%), and about the same as the 41% reported for all US public firms for 2007-2016 (Fried and Wang, 2019).

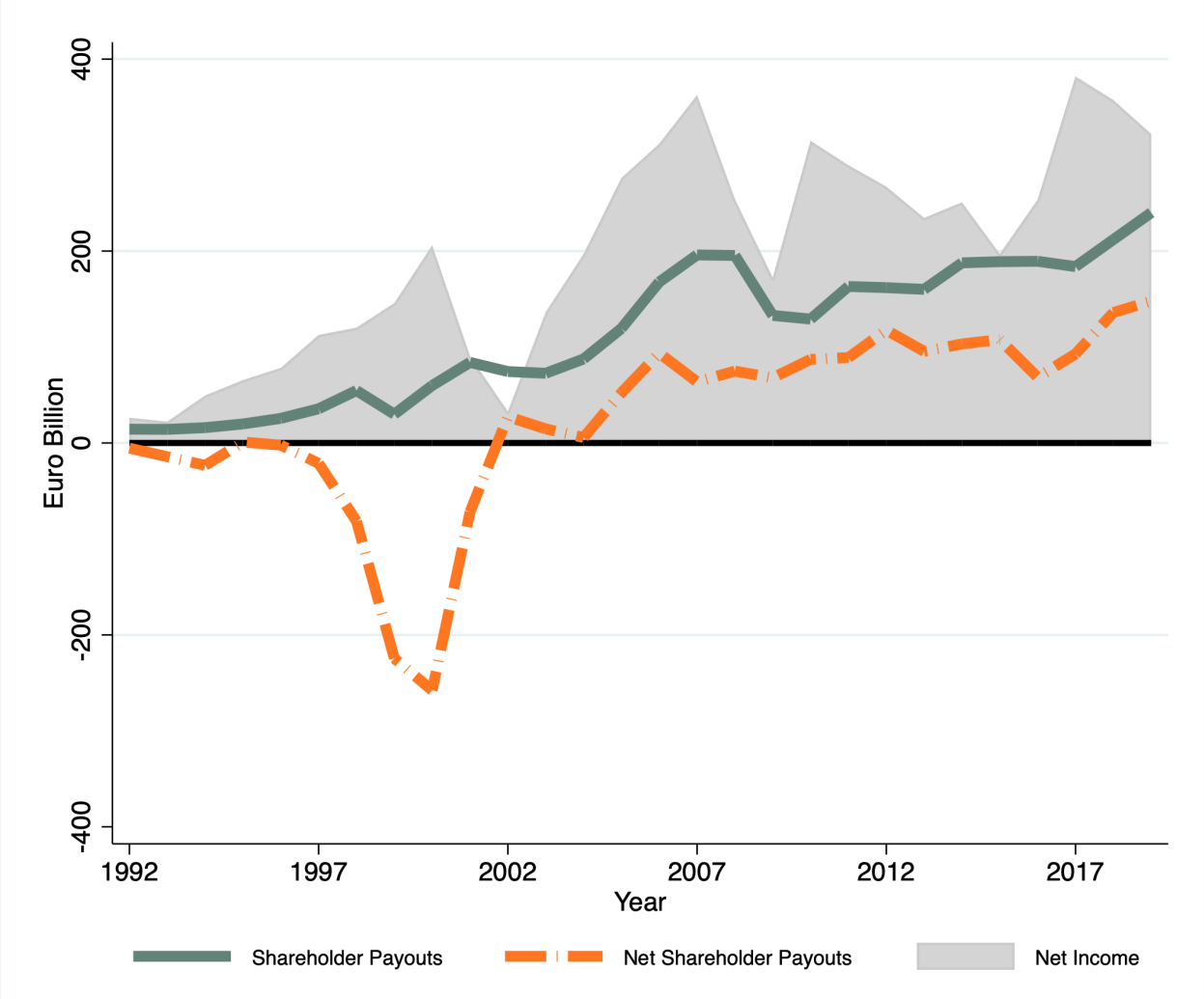

Figure 4: EU Public Firm Shareholder Payouts and Net Shareholder Payouts (1992-2019) The solid line depicts the time series of annual shareholder payouts among EU public firms, computed from Compustat as the sum of dividends and repurchases. The dashed line depicts the time series of annual net shareholder payouts, computed as the sum of dividends and repurchases minus issuances, following Eq. (1) and (2). Aggregate annual net income is depicted in the gray background. Details of variable construction are presented in Table A1.

3.4 Smaller Firms

Our analysis above illustrates a major problem with using shareholder payouts (dividends and repurchases) as evidence of short-termism in the public markets: it ignores offsetting equity issuances, both direct and indirect. We next examine the differences between the largest 500 firms (by market capitalization) each year and all other firms. These 500 firms, which represent between 15% to 20% of our sample in each year since 2000, are likely to be the most established and least

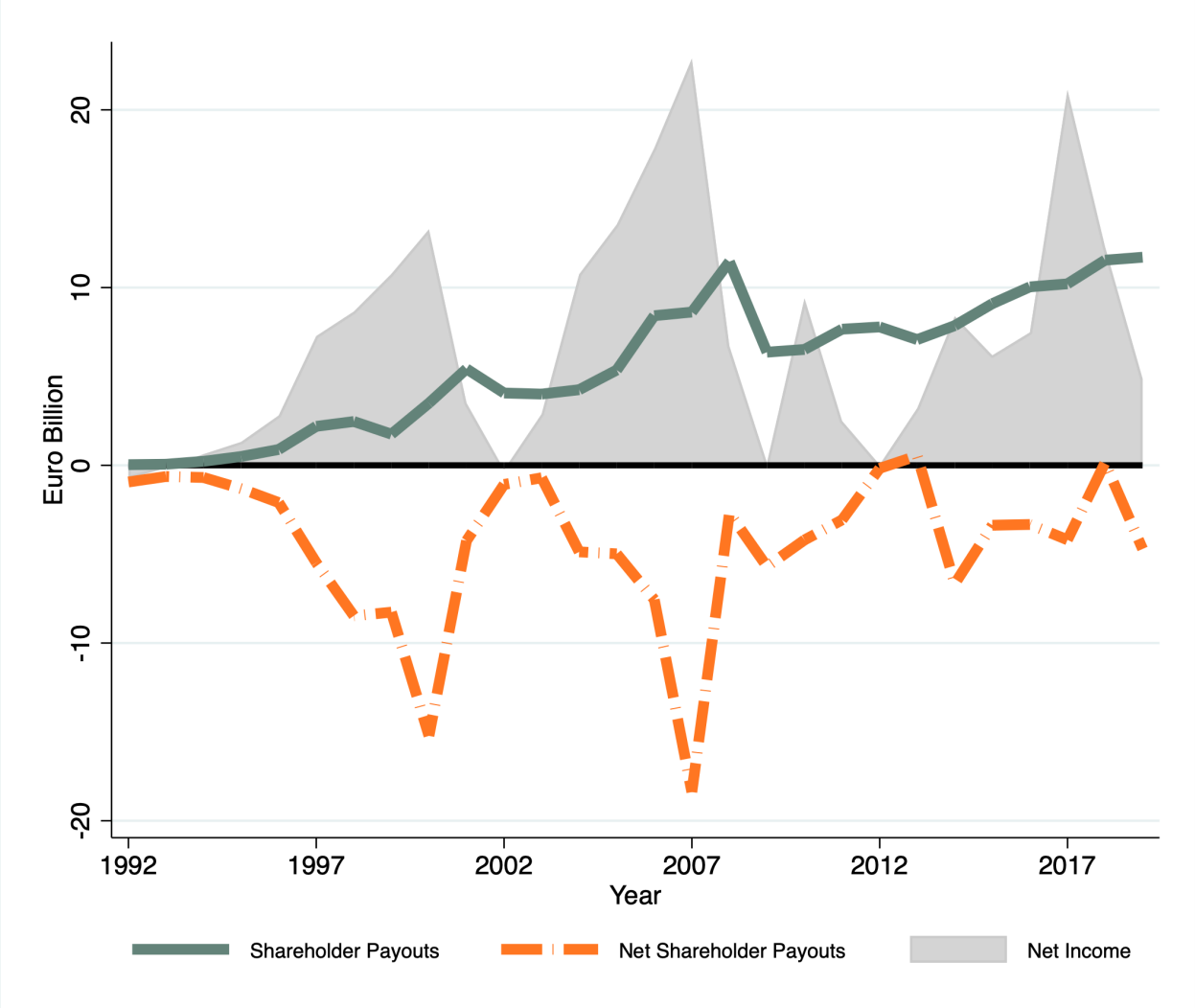

Figure 5: Shareholder Payouts and Net Shareholder Payouts by Smaller EU Public Firms (1992-2019) The solid line depicts the time series of annual shareholder payouts among smaller firms (i.e., firms whose market capitalizations are not in the top 500 in a given year), computed as the sum of dividends and repurchases. The dashed line depicts the time series of annual net shareholder payouts, computed as the sum of dividends and repurchases minus issuances, following Eq. (1) and (2). Aggregate annual net income is depicted in the gray background. Details of variable construction are presented in Table A1.

in need of excess cash flow. Consistent with this assumption, we find that positive net shareholder payouts by EU public firms are due entirely to these largest firms. In particular, we find that smaller EU public firms (see Figure 5 or Panel A of Table 3)—those outside of the top 500 by market capitalization in a given year—are net importers of equity capital in nearly every year of these three decades, absorbing a substantial portion (about 13%) of the net shareholder payouts by the largest 500 firms.

4 Net Shareholder Payouts and Investment Capacity

Having described net shareholder payouts by EU public firms, we proceed to analyze whether net shareholder payouts at these levels were likely to drain public firms of the capital necessary for investment and innovation. The answer is no.

Following Fried and Wang (2019), we examine the ratio of net shareholder payouts to a measure of investment-available income. We then examine evidence on EU public firms' investment levels and investment intensity, and show that there is no evidence of a reduction in either during 1992-2019. Moreover, R&D intensity has been increasing steadily since the mid-1990s and is at record highs by 2019. At the same time, cash reserves grew substantially, leaving plenty of dry powder available for any additional investment deemed warranted. Together, this evidence is inconsistent with short-termism depriving EU firms of capital needed for investment. Instead, it is consistent with public firms having more equity capital than they need for the investment opportunities available.[18]

4.1 R&D-Adjusted Net Income

Another measurement problem stems from the comparison of payouts to net income. Net income provides a poor measure of income available for investment: it assumes that the expenses deducted to arrive at net income are entirely unrelated to future-oriented investment. In fact, net income is computed after deducting the substantial expenses associated with R&D, which is by definition future-oriented.

Consider again the Dassault example above. Dassault makes significant investments in research and development, including the costs associated with personnel, equipment (such as computers), and tools used for R&D. The costs associated with these activities are important for the long-term success of the company, but are typically expensed (i.e., deducted from total revenues in computing net income) for financial reporting purposes. For example, Dassault's net income in 2017 was €520 million, but this figure is net of €576 million of R&D expenses (111% of net income). Similarly, across our full sample of EU firms, during 1992-2019 total R&D expenditures for EU public firms added up to about 43% of total net income. Because R&D expenses are significant, net income is

[18] To fully trace the sources and uses of capital flows in public firms, one would need to track not only shareholder-firm capital flows but also creditor-firm capital flows (Fried and Wang, 2019).

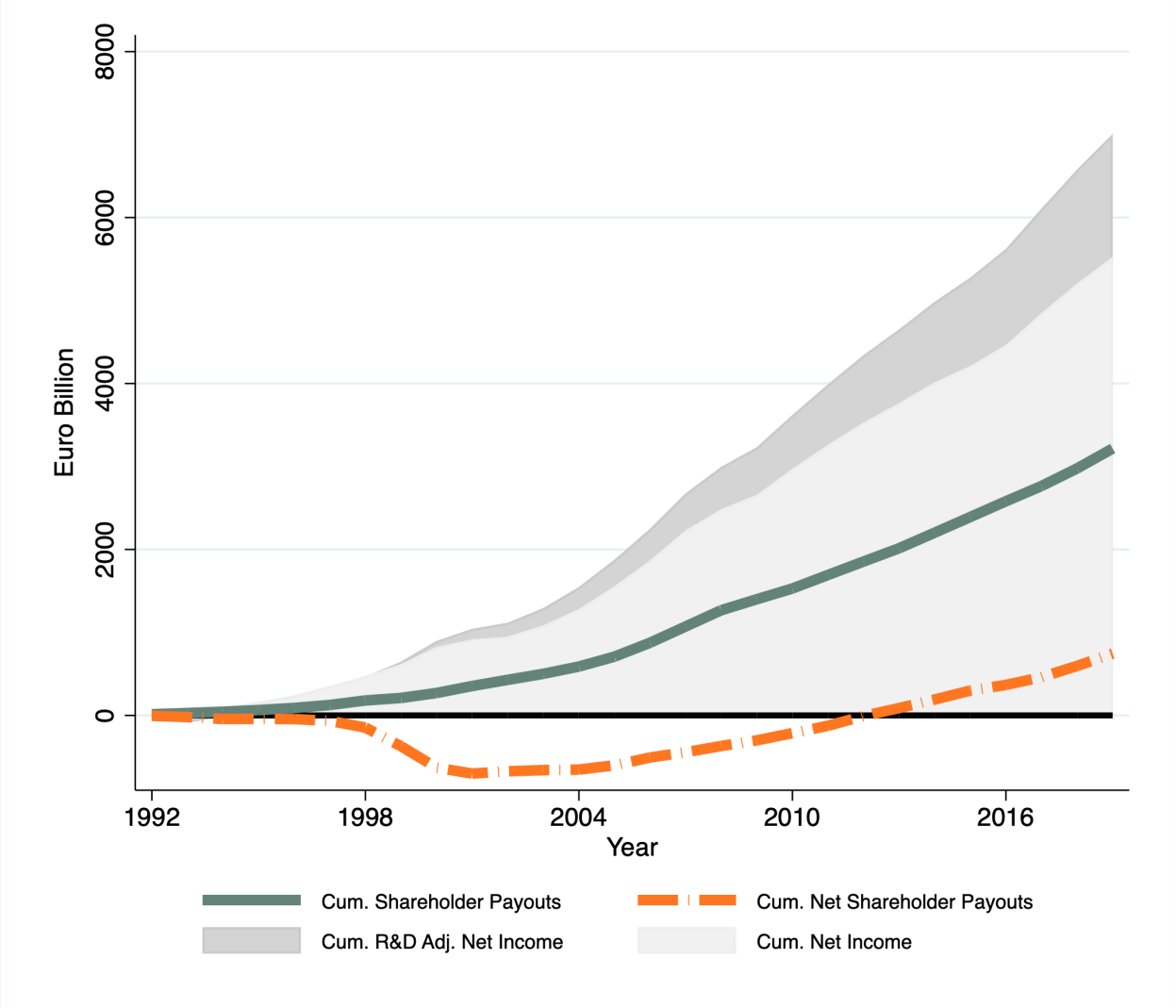

Figure 6: Cumulative Excess Income Available for Investment by EU Public Firms (1992-2019) The short-dash line depicts the time series of the difference between EU public-firm cumulative net income and cumulative shareholder payouts. The long-dash line depicts the difference between EU public-firm cumulative net income and cumulative *net* shareholder payouts. Finally, the solid line depicts the time-series of EU public-firm cumulative R&D-adjusted net income and cumulative *net* shareholder payouts, where R&D-adjusted net income is net income plus R&D expense (net of effective tax rate). Details of variable construction are presented in Table A1.

a very misleading measure of income available for investment. At best, net income measures the amount available for CAPEX and *additional* R&D.

Following Fried and Wang (2019), we compute a measure of income available for investment—"R&D-adjusted net income"—that adds a firm's R&D expenses (net of its effective tax rate) back

to net income.[19,20] Net shareholder payouts as a percentage of R&D-adjusted net income appear quite low.

Figure 6 shows cumulative payouts and cumulative net payouts against the background of cumulative net income and cumulative R&D-adjusted net income. During 1992-2019, net shareholder payouts by EU public firms amounted to only 11% of R&D-adjusted net income. After net shareholder payouts, these firms would have had €6.3 trillion available for CAPEX, R&D, and other investments by the end of 2019, even had they started the period with zero cash balances.[21] In the most recent decade, net shareholder payouts by EU public firms were 28% of R&D-adjusted net income, close to the 33% reported for US public firms during 2007-2016 (Fried and Wang, 2019).[22] After net shareholder payouts during 2010-2019, EU public firms would have had €2.7 trillion available for CAPEX, R&D, and other investment.

As a robustness check, we also performed the analysis using a sample of firms headquartered in the four largest EU economies: Germany, France, Italy, and Spain. As we report in Table B of Table 3, during 1992-2019 shareholder payouts amounted to €2.1 trillion, accounting for 57% of these firms' cumulative net income and 65% of total EU listed-firm shareholder payouts. However, net shareholder payouts by firms from these four EU economies amounted to only 11% of their cumulative net income and 9% of their cumulative R&D-adjusted net income. In the most recent decade, shareholder payouts amounted to 62% of net income, but net shareholder payouts amounted to 37% of net income and 27% of R&D-adjusted net income. At these levels, EU firms (altogether or just those from the four largest economies) do not appear to be deprived of capital for investment and innovation.

[19] We compute for each firm in each year an effective tax rate equal to the ratio of tax expense (Compustat Global field *txt*) to pretax income (Compustat field *pi*). To mitigate the influence of outliers, we censor effective tax rates at 0 and 1.

[20] In principle, a good measure of income available for investment adds to net income all the income-statement expenses that can be considered future-oriented investment. Certain SG&A, marketing, or personnel expenses could be considered part of future-oriented investment for some firms. Thus, our approach to adjust net income by adding back only R&D expenses is conservative and likely understates the true investment-available income of EU public firms.

[21] If investment-available income is measured as the difference between net income and shareholder payouts, public firms only accumulated €2.3 trillion during 1992-2019. Taking into account equity issuances dramatically changes the picture: the cumulative difference between net income and net shareholder payouts during 1992-2019 was €4.8 trillion. If tax-adjusted R&D expenses are taken into account, the difference between investment-available income and net shareholder payouts was €6.3 trillion during that period.

[22] Column 10 of Table 2 reports the ratio of net payouts to R&D-adjusted net income for our main sample. Column 10 of Table 3 reports comparable figures for small firms and firms of the four largest EU economies.

4.2 Investment Levels, Investment Intensity, and Cash Balances

We now consider what EU public firms did during 1992-2019 with the considerable investment capacity they generated. During this period, overall investment appeared to have climbed significantly, both in absolute terms and as a percentage of revenues. We examine two measures of total investment: CAPEX plus R&D (Fried and Wang, 2019) and a broader measure that also includes net acquisitions—acquisitions (Compustat field *aqc*) minus sale of fixed assets (Compustat field *psfix*) (Richardson, 2006). We examine this broader measure of investment because a firm can invest in its future growth not only by creating additional productive capacities internally (e.g., through CAPEX or R&D) but also by acquiring the productive capacities generated by other firms. We also examine R&D separately because it is closely associated with investments in innovation as well as discretionary, bottom-line-affecting expenses that managers are most likely to cut in the face of short-term earnings pressures (Graham et al., 2005).

Figure 7 (and columns 1-4 of Table 4) shows that overall investment levels have increased over the last three decades, regardless of how they are measured. Although there has been variation in these levels corresponding to the business cycle, there has been a steady upward trend.[23]

Notably, in the most recent decade—when shareholder activism in the EU was on the rise—investment levels increased steadily and reached record highs. EU public firms' investment in CAPEX, R&D, and net acquisitions increased from €480 billion in 2010 to €638 billion in 2019 (a 33% increase), one of the highest levels on record. The 2018 levels totaled €690 billion, the highest on record. We observe similar time-series patterns in EU firms' investments in CAPEX and R&D, which grew 25% from 2010 (€457 billion) to 2019 (€569 billion). Most interestingly,

[23] We note that very few firms disclosed positive CAPEX in the early period of the sample. For example, more than 90% of the firms in 1992-1994 did not report a positive value for CAPEX. The data provider verified that the data reflect what is reported in their financials. Thus, firms' disclosure practices likely evolved over time. In any event, starting in 1997 the percentage of firms disclosing positive CAPEX sharply increases, with about 70% of the firms reporting positive CAPEX. Even if we restrict our analysis to investment disclosures from 1997 onward (because they are most reliable), the observation that investment levels are increasing over time remains unchanged.

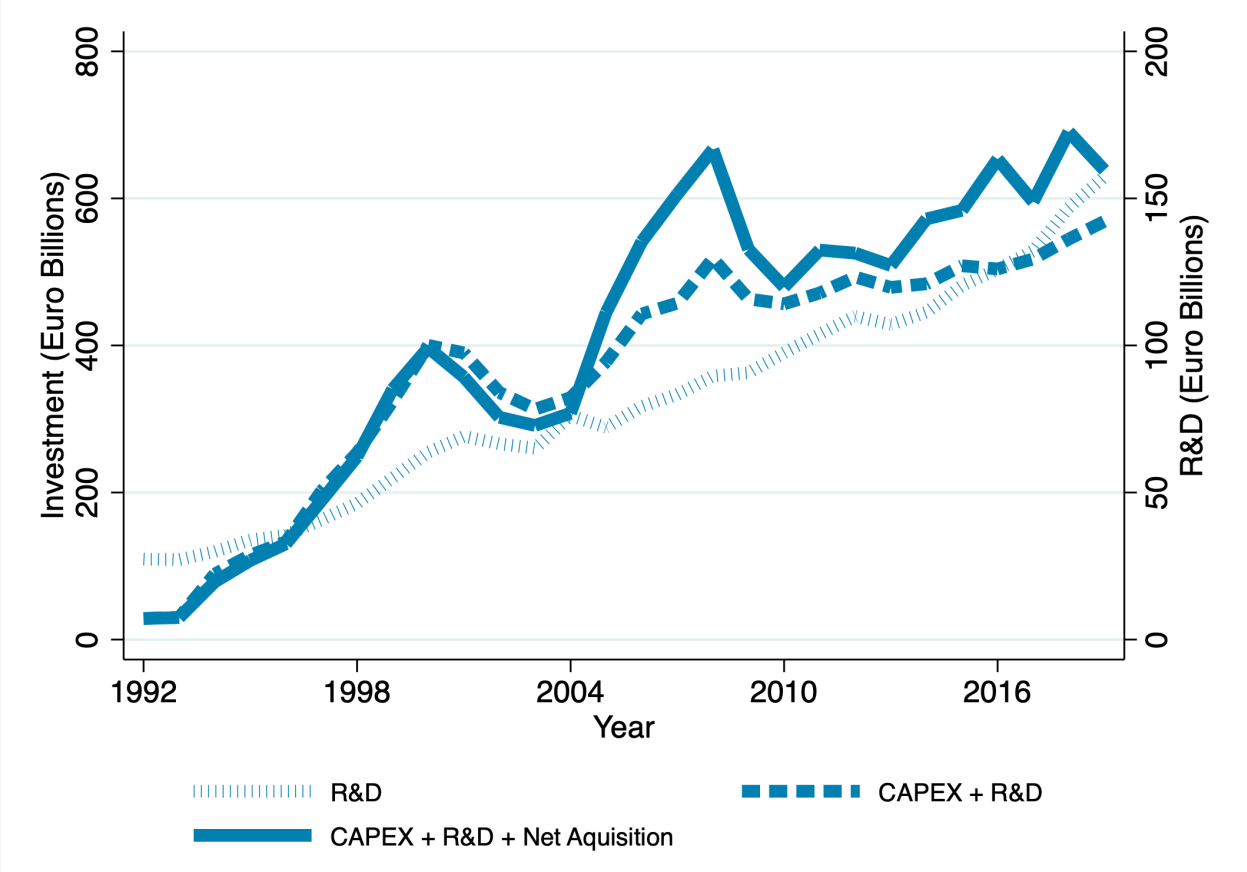

Figure 7: EU Public Firm Investment Levels (1992-2019) The solid line depicts the time series of annual total public-firm investments: the sum of capital expenditures (CAPEX), research and development expenses (R&D), and net acquisitions (acquisitions minus sales of fixed assets). The bold-dash line depicts the time series of EU public-firm annual total CAPEX and R&D expenses. The thin-dash line depicts the time series of EU public-firm annual total R&D expenses.

R&D expenditures increased 60% during 2010-2019, from €98 billion to €157 billion.[24] In each of the last ten years, total R&D expenditures increased and reached a historic high. Given managers' preferences for cutting expenses like R&D in the face of earnings pressures (Graham et al., 2005), these findings are inconsistent with EU corporate managers succumbing to short-termism. Not

[24]Our figures on R&D here and below are based only on the expensed portion of companies' R&D expenditures (what Compustat Global's *XRD* field captures). These figures ignore the portion of each period's R&D investments that is capitalized, which is allowed under IFRS for certain development costs. However, supplemental analyses suggest that including the capitalized portion of companies' R&D expenditures would not materially affect our conclusions. In particular, we supplement our Compustat Global sample with data from Worldscope, which collects information about net capitalized development costs (*ITEM2504*) and amortization of capitalized R&D (*ITEM1153*). We then define an alternative measure that better reflects the total investment in R&D in a given year: R&D expense plus amortization of capitalized R&D plus the increase in net capitalized development costs. We obtain nearly identical trends and levels in our three investment measures when defined using the alternative R&D investment measure. Similarly, our analyses and inferences about investment intensity are nearly identical using the alternative measure of R&D investment.

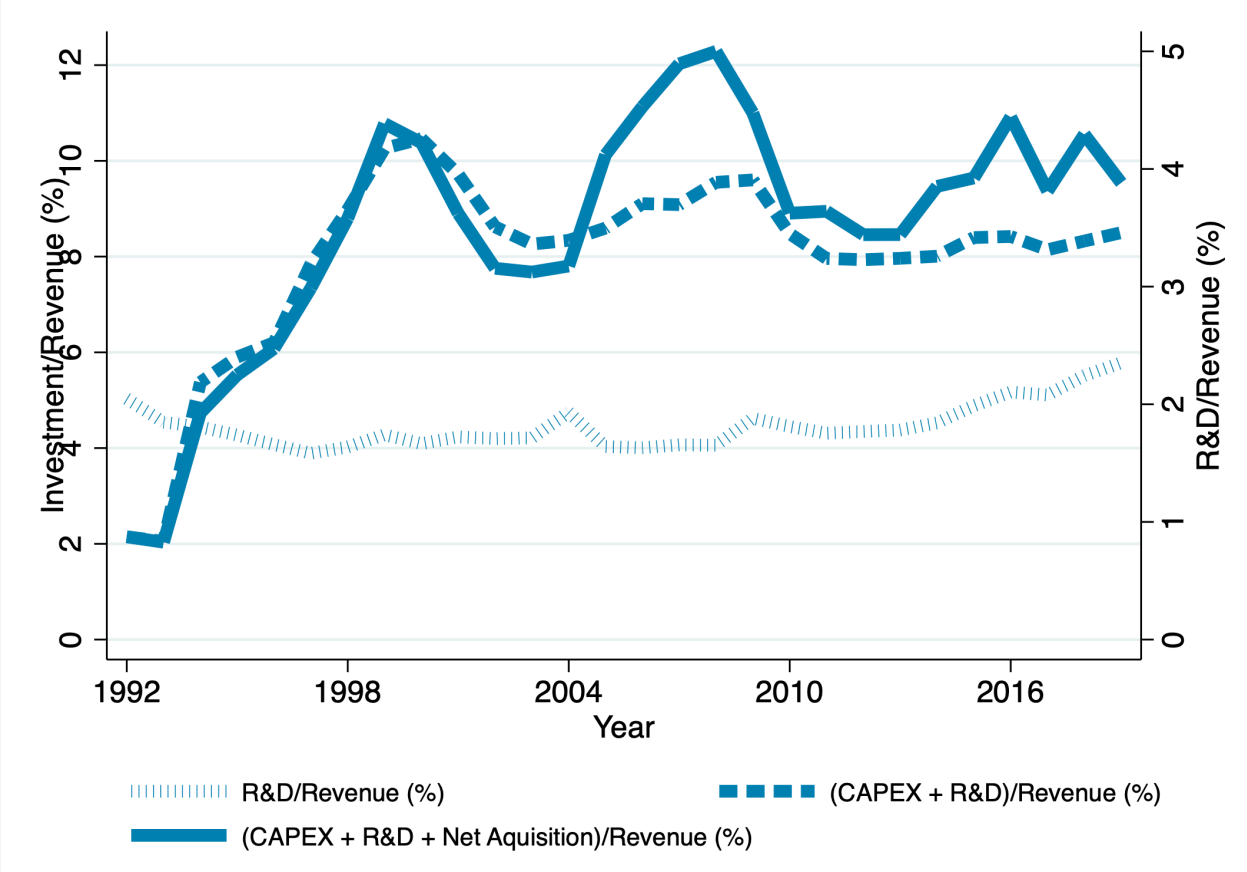

Figure 8: Investment Intensity at EU Public Firms (1992-2019) The solid line depicts the time series of annual total public-firm investments: the sum of capital expenditures (CAPEX), research and development expenses (R&D), and net acquisitions (acquisitions minus sales of fixed assets) divided by annual total EU public-firm revenues. The bold-dash line depicts the time series of EU public-firm annual total CAPEX and R&D expenses divided by annual total EU public-firm revenues. The thin-dash line depicts the time series of EU public-firm annual total R&D expenses divided by annual total EU public-firm revenues.

only have investment levels not collapsed, but they have also steadily increased and reached record highs in recent years.

Rising levels of investments could simply result from inflation or the growing size of businesses. Thus, we also examine the evolution of investment intensity, as measured by total investment divided by total revenues (following Fried and Wang, 2019). Figure 8 plots the three investment intensity time series in the 1992-2019 period using the three investment measures from Figure 7. We also report these intensity figures in columns 5-8 of Table 4.

We again find a general and significant upward trend from the early 1990s to 2019. As mentioned above, data quality in the early 1990s is questionable. If we use 1997 as a starting point, our

inference of an increasing trend in investment intensity is unchanged.[25] Of course, one could cherry-pick a different starting point (say, 2001 or 2008) and show that investment capacity has declined relative to the starting point. However, the evidence of Figure 8 does not show a long-term collapse of investment intensity, as one would expect if firms lacked adequate capital.

In the most recent decade, when both shareholder activism and warnings of short-termism have been more common, we find that overall investment intensity has remained stable (moving from 8.48% in 2010 to 8.50% in 2019, calculated using the sum of CAPEX and R&D to capture investment) or increased (from 8.91% in 2010 to 9.54% in 2019, calculated using the broader measure of investment that includes net acquisitions). And in the most recent decade, R&D intensity has increased significantly: from 1.81% in 2010 to 2.35% in 2019 (about a 30% increase). In the last five years of our sample (2015-2019), R&D intensity reached the highest levels observed over the entire sample.[26] Moreover, the significant increase in R&D intensity offsets a decline in CAPEX intensity over the same period (about an 8% decline from 6.67% to 6.15%) so that the intensity of CAPEX and R&D investments combined increased during 2010-2019 (from 8.48% to 8.50%). We would not expect these patterns if EU managers succumbed to short-termist pressures; because the value of R&D expenditures is relatively uncertain (compared to, for example, CAPEX), and R&D expenditures reduce the bottom line in the short run, cutting discretionary expenses such as R&D is a common response of managers trying to meet short-term earnings targets (Graham et al., 2005).

One might argue that investment intensity would have been even higher had firms not dis-

[25]The investment intensity patterns we show are inconsistent with the findings of Ernst & Young (2020), which claims that the ratio of EU public-firm CAPEX to EU public-firm total revenues declines from 1992 to 2018, from about 8% to 6%. However, the report's analysis is based on a subsample of EU firms that disclose positive CAPEX, apparently from Compustat Global, which introduces two problematic biases. First, excluding firms without positive CAPEX obviously biases upward reported investment intensity in periods (such as the 1990s) where there are more such firms. Second, Compustat Global reports more such zero-CAPEX firms than other databases, and if one uses the zero-CAPEX selection criteria on a broader sample of firms, the reported results are reversed. For example, by supplementing Compustat's CAPEX field using Worldscope (i.e., replacing Compustat CAPEX values with Worldscope whenever Worldscope reports non-missing values but Compustat reports zero or missing values), and following the same sample selection criterion as Ernst & Young (2020), we again find that investment intensity increases significantly during 1992-2019.

[26]Ernst & Young (2020) shows evidence of a declining trend using a small sample of 475 firms that report positive net income and engage in R&D. We can replicate similar findings using the same sample selection criteria, but we once again question the sample selection choices (which drops 63% of the unique firms and 80% of the observations from our sample). For example, focusing only on positive net income firms is likely to bias the sample towards more mature firms. Moreover, about 30% of our sample of firms that report non-missing R&D report *negative* net income. In our view, the presence of R&D firms with negative earnings is a sign of a well-functioning market, and thus should not be excluded from the analysis. A more sensible starting point for analyzing EU public firms' investment behavior is the full sample of EU public firms.

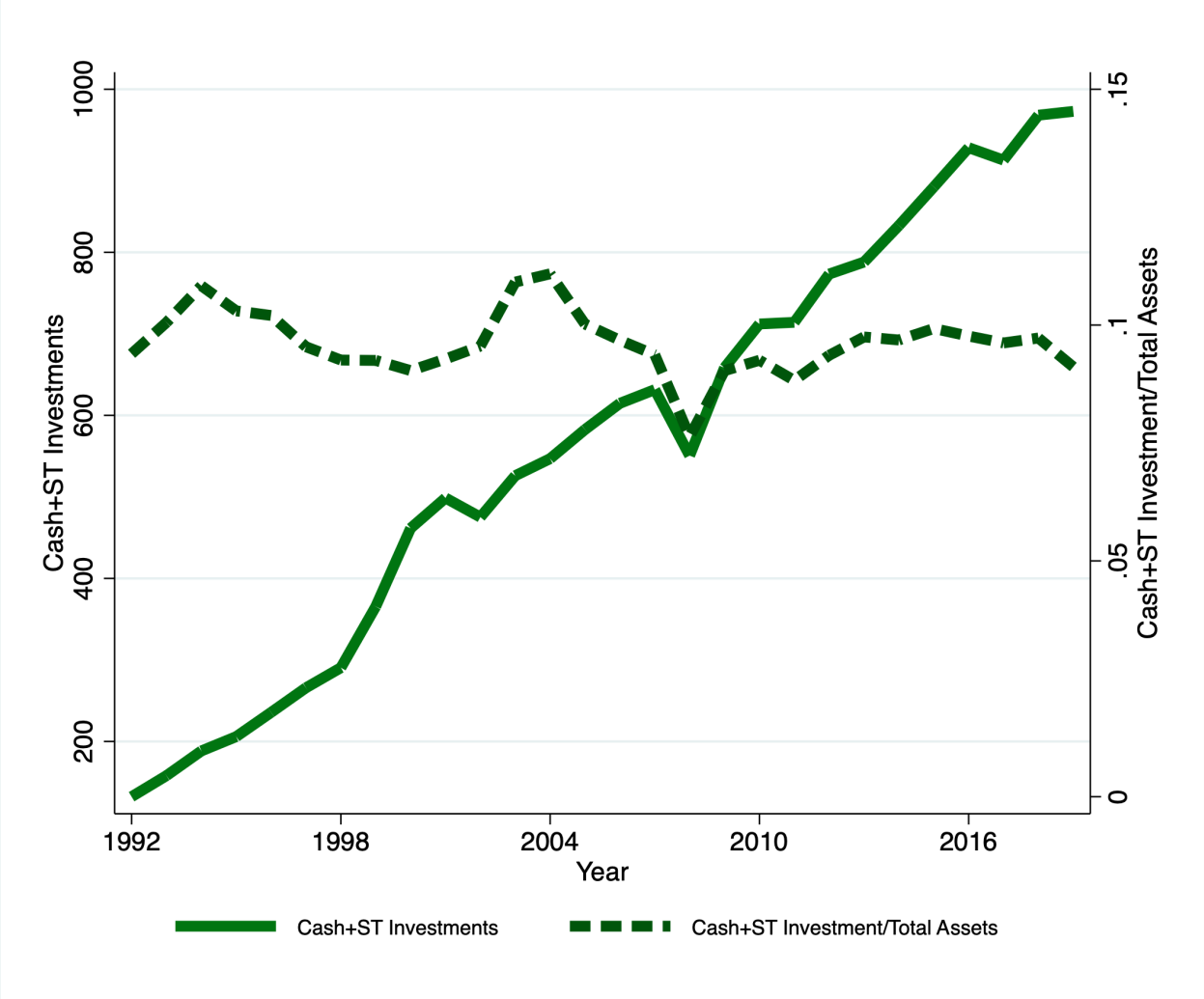

Figure 9: Cash Balances at EU Public Firms (1992-2019) The solid time series reports the Eurodollar level of EU public firms' aggregate cash balances and short-term investments (Compustat Global field *che)*. The dashed time series reports the ratio of EU public-firm aggregate cash balances and short-term investments to aggregate total assets (Compustat field *at*).

tributed so much capital to shareholders. Although the counterfactual is not observable, we note that EU public firms' aggregate cash stockpiles were significant and growing over the last three decades. Figure 9 (and columns 9 and 10 of Table 4) reports aggregate cash (and cash-equivalent short-term investments) on EU public firms' balance sheets during 1992-2019. In 1992, public firms held €132 billion in cash. By 2019, this cash pile had grown sevenfold to €973 billion. Over the last decade, cash levels have grown nearly 40%. As a percentage of total assets, cash on EU public firms' balance sheets has remained stable, between 9 and 10%. There is no evidence that EU public firms have been depleting their cash reserves, either in absolute magnitudes or as a percentage of

total assets.

These data indicate that public firms in aggregate had considerable cash reserves during 1992-2019; these reserves did not dry up as a result of shareholder payouts but rather increased despite them. Thus, it seems unlikely that investment intensity in public firms was restrained because firms lacked cash. A more likely explanation is that there were not enough investment opportunities to absorb all of the cash left after firms engaged in share repurchases and dividends.

5 Conclusion

In the EU, rising levels of shareholder payouts are cited as evidence of "short-termism" and "quarterly capitalism" and as an impediment to long-term investment and innovation. We show that after taking into account large equity issuances by EU public firms, their net shareholder payouts have been relatively modest, and lower than in the US over the last decade or so, leaving firms ample resources for investment. Over the last three decades, investment levels and investment intensity have increased, and R&D levels and intensity are now at record highs. Meanwhile, cash balances have increased, providing ample dry powder for any additional investment that is warranted.

We also note that any given EU public firm that needs cash for new investment can always issue even more equity to public investors. And just as we showed that smaller EU public firms are net importers of equity capital, so are young private firms. Thus, net shareholder payouts by larger EU public companies are not "wasted" from an economic perspective: investors receiving these payouts can be expected to seek higher returns by re-investing the cash in faster-growing smaller firms, enabling these firms to invest and hire workers. In short, there is no evidence that the volume of share repurchases and dividends by EU public firms is sending a distress signal about EU corporate governance.

There is, of course, room for improvement. While this paper shows that R&D in the EU has been rising, it is rising even faster in the US (Fried and Wang, 2019); EU firms also appear to be less innovative than US public firms (Rybnicek, 2020). But these differences appear to be driven by diverging attitudes about risk-taking (Ezell and Marxgut, 2015); America's more active venture capital sector (Tsanova and Havenith, 2019; Rybnicek, 2020) which spawns cutting-edge young

firms that can be acquired by, or become, public firms; and Europe's fragmentation into almost 30 countries with different rules and regulations (Tsanova and Havenith, 2019), not to mention languages and cultures. Reducing the level of shareholder payouts by EU public firms will not overcome any of these obstacles, but can make things worse—by reducing the supply of capital for innovative private firms.

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Table A1: Description of Variables

Variable	Description
Repurchases	Similar to Boudoukh et al. (2007), we define repurchases as the purchase of common and preferred shares (Compustat item *prstkc*) plus purchase of treasury shares (Compustat item *purtshr*) less any decrease in the value of preferred stock (Compustat item *pstkrv*).
Dividends	We compute total dividends for firm i in month t from the Compustat Global Security Daily file by multiplying gross dividends per share (Compustat field *div*) by shares outstanding (Compustat field *cshoc*) and summing over the firm's observations each month.
Net Equity Issuances	We estimate net equity issuances as the change in shares between two months multiplied by the average price of the current month: $[(cshoc_t \times ajexdi_t) - (cshoc_{t-1} \times ajexdi_{t-1})] \times [mean(prccd_t / ajexdi_t)]$
Equity Issuances	We estimate total equity issuances by summing net equity issuances and repurchases.
Net Income	Fiscal year-end net income (Compustat item *ni*).
Shareholder Payouts	Shareholder payouts are the sum of repurchases and dividends.
Net Shareholder Payouts	Net shareholder payouts are the sum of dividends less net equity issuances.

Table 1:
Sample Summary

This table describes the total observations (column 1) and unique firms (column 2) in our sample by headquarter country. The table also reports, for each country, the first (column 3) and last (column 4) year in which there is a valid observation.

Country	(1) *Total Observations*	(2) *Unique Firms*	(3) *Min Year*	(4) *Max Year*
Austria	1,509	126	1992	2019
Belgium	2,100	166	1992	2019
Bulgaria	519	58	2006	2019
Croatia	898	77	1997	2019
Cyprus	640	53	1997	2019
Czech Republic	311	37	1995	2019
Denmark	2,455	202	1992	2019
Estonia	238	18	1997	2019
Finland	2,588	191	1992	2019
France	12,696	1,074	1992	2019
Germany	12,733	1,051	1992	2019
Greece	3,423	255	1995	2019
Hungary	402	42	1995	2019
Ireland	843	78	1992	2019
Italy	4,598	427	1992	2019
Latvia	379	31	1999	2019
Lithuania	476	42	1997	2019
Luxembourg	403	38	1992	2019
Malta	10	2	2014	2019
Netherlands	2,988	250	1992	2019
Poland	6,542	764	1996	2019
Portugal	1,011	81	1992	2019
Romania	1,028	139	1997	2019
Slovakia	156	14	1997	2019
Slovenia	401	31	1997	2019
Spain	2,710	221	1992	2019
Sweden	6,730	705	1992	2019
All	68,787	6,173	1992	2019

Table 2:
Gross and Net Shareholder Payouts

Columns 1-5, Panel A of this table report (for each year between 1992 and 2019) EU public firms': total dividends (*Div*), total share repurchases (*Repo*), total gross shareholder payouts (*Gross Payout* or *Div* + *Repo*), total net income (*NI*), and the ratio of *Gross Payout* to *NI* times 100. Columns 6-8, Panel A of this table report for each year EU public firms': total equity issuances (*Issue*), net shareholder payouts (*Net Payout* or *Div* + *Repo* - *Issue*), and the ratio of *Net Payout* to *NI* times 100. Columns 9 and 10, Panel A, of this table reports for each year EU public firms' R&D-adjusted net income (*Adj NI* or the sum of net income and R&D expenses net of the effective tax rate) and the ratio of *Net Payout* to *Adj NI* times 100. Panel B of this table reports these figures for 1992-2019 and 2010-2019. Columns 5, 8, and 10 are reported in percentage points. All other columns are reported in billions of euros.

Year	(1) *Div*	(2) *Repo*	(3) *Gross Payout*	(4) *NI*	(5) $\frac{Gross\ Payout}{NI}$ (%)	(6) *Issue*	(7) *Net Payout*	(8) $\frac{Net\ Payout}{NI}$ (%)	(9) *Adj NI*	(10) $\frac{Net\ Payout}{Adj\ NI}$ (%)
Panel A: By Year										
1992	14.37	0.01	14.38	26.24	54.81	19.76	-5.38	-20.51	43.87	-12.26
1993	14.16	0.02	14.18	22.21	63.86	28.45	-14.27	-64.26	-131.07	10.89
1994	15.53	0.46	15.99	49.41	32.37	39.31	-23.32	-47.20	69.87	-33.38
1995	19.12	0.74	19.86	65.52	30.31	18.88	0.98	1.49	90.92	1.07
1996	24.16	1.51	25.67	78.15	32.85	27.95	-2.27	-2.91	103.52	-2.20
1997	31.11	4.55	35.65	112.55	31.68	56.84	-21.19	-18.83	140.42	-15.09
1998	46.92	7.72	54.63	120.13	45.48	136.12	-81.48	-67.83	150.92	-53.99
1999	19.36	10.67	30.03	145.73	20.61	254.50	-224.47	-154.03	179.13	-125.31
2000	40.82	19.07	59.89	205.95	29.08	317.71	-257.81	-125.18	250.70	-102.84
2001	58.28	25.74	84.02	90.52	92.82	155.90	-71.88	-79.40	144.71	-49.67
2002	60.85	13.60	74.46	32.73	227.47	46.99	27.47	83.91	73.70	37.27
2003	60.05	12.62	72.66	136.33	53.30	57.98	14.68	10.77	176.92	8.30
2004	68.73	18.83	87.56	196.83	44.49	81.85	5.71	2.90	253.84	2.25
2005	86.41	32.90	119.31	276.07	43.22	67.01	52.30	18.95	329.75	15.86
2006	124.72	43.01	167.74	311.80	53.80	74.08	93.66	30.04	373.11	25.10
2007	128.27	67.72	195.99	362.56	54.06	132.25	63.74	17.58	426.58	14.94
2008	139.47	55.97	195.44	254.07	76.92	120.52	74.92	29.49	318.54	23.52
2009	124.97	7.97	132.94	172.22	77.19	65.08	67.86	39.40	237.28	28.60
2010	114.10	15.05	129.15	314.90	41.01	42.04	87.10	27.66	387.85	22.46
2011	134.24	28.86	163.10	289.43	56.35	74.09	89.00	30.75	370.24	24.04
2012	139.89	22.01	161.90	267.18	60.59	44.27	117.62	44.02	351.55	33.46
2013	133.20	26.93	160.12	234.54	68.27	64.65	95.48	40.71	310.53	30.75
2014	150.33	37.40	187.73	250.72	74.87	84.52	103.21	41.17	332.65	31.03
2015	146.79	42.20	188.99	196.95	95.96	81.28	107.71	54.69	290.51	37.08
2016	150.22	39.16	189.38	253.61	74.67	120.88	68.50	27.01	347.32	19.72
2017	153.90	29.94	183.85	382.00	48.13	91.07	92.78	24.29	484.85	19.14
2018	163.49	48.49	211.98	357.32	59.32	76.05	135.93	38.04	470.26	28.91
2019	177.43	62.56	239.99	322.03	74.52	92.08	147.91	45.93	429.97	34.40
Panel B: By Sample Period										
1992-2019	2,540.89	675.71	3,216.60	5,527.72	58.19	2,472.11	744.49	13.47	7,008.47	10.62
2010-2019	1,463.58	352.60	1,816.18	2,868.70	63.31	770.93	1,045.25	36.44	3,775.75	27.68

Table 3:

Gross and Net Shareholder Payouts: Small Firms and Top 4 Countries

Columns 1-5 of this table report for each sample period (1992-2019 or 2010-2019) certain EU public firms': total dividends (*Div*), total share repurchases (*Repo*), total gross shareholder payouts (*Gross Payout* or *Div* + *Repo*), total net income (*NI*), and the ratio of *Gross Payout* to *NI* times 100. Columns 6-8 of this table report for each period certain EU public firms': total equity issuances (*Issue*), net shareholder payouts (*Net Payout* or *Div* + *Repo* - *Issue*), and the ratio of *Net Payout* to *NI* times 100. Columns 9 and 10 of this table report for each period certain EU public firms' R&D-adjusted net income (*Adj NI* or the sum of net income and R&D expenses net of the effective tax rate) and the ratio of *Net Payout* to *Adj NI* times 100. Panel A reports the figures for a sample of small EU public firms, which excludes from our main sample the 500 firms with the largest beginning-of-calendar-year market capitalization. Panel B reports the figures for the sample of EU public firms headquarters in the largest four EU economies: France, Germany, Italy, and Spain. Columns 5, 8, and 10 are reported in percentage points. All other columns are reported in billions of euros.

Year	(1) *Div*	(2) *Repo*	(3) *Gross Payout*	(4) *NI*	(5) $\frac{Gross\ Payout}{NI}$ (%)	(6) *Issue*	(7) *Net Payout*	(8) $\frac{Net\ Payout}{NI}$ (%)	(9) *Adj NI*	(10) $\frac{Net\ Payout}{Adj\ NI}$ (%)
Panel A: Small Firms (Excluding largest 500 by Market Capitalization)										
1992-2019	127.39	31.71	159.10	197.24	80.66	281.42	-122.32	-62.02	285.19	-42.89
2010-2019	73.05	16.45	89.50	75.43	118.65	118.52	-29.03	-38.48	129.65	-22.39
Panel B: Largest Four EU Economies (France, Germany, Italy, Spain)										
1992-2019	1,722.72	363.33	2,086.05	3,643.63	57.25	1,683.42	402.63	11.05	4,635.72	8.69
2010-2019	990.44	187.08	1,177.52	1,899.02	62.01	477.42	700.10	36.87	2,552.41	27.43

Table 4:
Investments and Cash Balances

Columns 1-4, Panel A of this table report for each year between 1992 and 2019 EU public firms': total capital expenditures (*CAPEX*), total research and development expenses (*R&D*), total *CAPEX* and *R&D* (*Inv1*), and the sum of *Inv1* and total net acquisitions (*Inv2*). Columns 5-8, Panel A of this table report for each year EU public firms' investment intensity, as measured by: the ratio of *CAPEX* to total revenues (*Rev*) multiplied by 100, the ratio of *R&D* to *Rev* multiplied by 100, the ratio of *Inv1* to *Rev* multiplied by 100, and the ratio of *Inv2* to *Rev* multiplied by 100. Columns 9 and 10 of Panel A report, for each year, the sum of EU public firms' end-of-year cash and cash equivalent balances (*Tot Cash*) and column 10 reports the ratio of *Tot Cash* to the sum of EU public firms' end-of-year total assets (*Assets*). Panel B of this table reports these figures for 1992-2019 and 2010-2019. We do not report pooled period values for columns 9 and 10, since these are stock variables or ratios of stock variables. Columns 5, 6, 7, 8, and 10 are reported in percentage points. All other columns are reported in billions of euros.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Year	*CAPEX*	*R&D*	*Inv1*	*Inv2*	$\frac{CAPEX}{Rev}$ (%)	$\frac{R\&D}{Rev}$ (%)	$\frac{Inv1}{Rev}$ (%)	$\frac{Inv2}{Rev}$ (%)	*Tot Cash*	$\frac{Tot\ Cash}{Assets}$ (%)
Panel A: By Year										
1992	1.35	27.37	28.72	28.72	0.10	2.05	2.15	2.15	132.24	9.39
1993	3.00	27.20	30.20	29.95	0.20	1.85	2.05	2.03	158.08	10.06
1994	59.14	29.95	89.09	78.49	3.57	1.81	5.37	4.74	188.38	10.83
1995	81.07	33.84	114.91	107.67	4.16	1.74	5.90	5.53	205.98	10.30
1996	97.39	35.51	132.90	130.27	4.55	1.66	6.20	6.08	235.67	10.20
1997	161.38	40.78	202.15	189.09	6.27	1.58	7.85	7.34	265.86	9.54
1998	207.69	46.30	253.99	248.85	7.34	1.64	8.98	8.80	290.50	9.26
1999	269.24	54.98	324.22	340.51	8.52	1.74	10.26	10.78	365.52	9.25
2000	336.44	63.71	400.16	396.91	8.80	1.67	10.46	10.38	461.51	9.03
2001	320.81	69.11	389.91	357.08	8.00	1.72	9.72	8.90	498.66	9.28
2002	269.53	66.58	336.11	302.34	6.91	1.71	8.62	7.76	475.20	9.55
2003	248.34	65.04	313.38	291.22	6.55	1.71	8.26	7.68	526.02	10.91
2004	252.82	76.23	329.05	307.89	6.41	1.93	8.34	7.80	546.93	11.09
2005	305.71	72.11	377.82	445.09	6.96	1.64	8.60	10.13	582.65	10.02
2006	363.50	79.29	442.79	541.29	7.48	1.63	9.11	11.13	614.80	9.68
2007	374.26	83.34	457.60	605.77	7.43	1.65	9.09	12.03	631.53	9.37
2008	428.62	89.61	518.23	666.62	7.90	1.65	9.55	12.29	550.63	7.63
2009	372.54	90.74	463.28	530.67	7.72	1.88	9.60	11.00	658.44	9.03
2010	359.07	97.53	456.61	479.63	6.67	1.81	8.48	8.91	712.10	9.25
2011	367.53	103.88	471.41	529.74	6.21	1.75	7.96	8.95	714.14	8.83
2012	383.18	109.92	493.09	525.58	6.17	1.77	7.94	8.46	773.35	9.36
2013	371.83	107.13	478.95	508.74	6.18	1.78	7.97	8.46	788.07	9.75
2014	372.63	111.31	483.94	572.07	6.17	1.84	8.01	9.47	832.83	9.68
2015	388.08	120.34	508.42	583.78	6.41	1.99	8.40	9.64	880.19	9.93
2016	378.12	125.98	504.10	653.40	6.32	2.10	8.42	10.91	928.31	9.77
2017	385.42	132.18	517.60	595.54	6.06	2.08	8.14	9.37	913.11	9.62
2018	397.90	146.81	544.71	690.45	6.08	2.24	8.33	10.55	968.21	9.73
2019	411.36	157.43	568.80	638.39	6.15	2.35	8.50	9.54	972.87	9.11
Panel B: By Sample Period										
1992-2019	7,967.93	2,264.21	10,232.14	11,375.74	6.51	1.85	8.36	9.30	–	–
2010-2019	3,815.12	1,212.50	5,027.62	5,777.31	6.23	1.98	8.21	9.44	–	–

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