UNIVERSITY OF TURKU
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STRATEGIC BUSINESS PORTFOLIO REALIGNMENT THROUGH ASSET SELL-OFFS

Impact on technology companies' performances and shareholder value creation

Empirical evidence from European stock markets

Master's thesis
in Accounting and Finance

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Abstract

The technology sector is constantly being realigned through merger and acquisition activity as a confluence of transformative trends and drivers of the competitive environment force technology companies to proactively evaluate their portfolios of assets, given the speed and magnitude of change. As the need for business portfolio realignment is emphasized in the ever-changing environment, corporate divestitures have become key considerations for technology companies aiming to focus proactively on long-term value creation through core business growth strategies.

Particularly, asset sell-offs enable realignment of the portfolio of assets to core competencies and burgeoning opportunities despite the typical constraints of technology companies increasing their cost of capital, as the proceeds can be reallocated more efficiently. Thus, disposing of unrelated assets should be associated with an improved competitive position, financial performance, and shareholder value.

Motivated by theories and empirical findings in finance and strategic management, this research examines the interdependence between asset sell-offs and both financial performance and shareholder value by studying how strategic asset sell-offs impact publicly traded technology companies' cash flow performance, profitability, and shareholder value creation using the data from the beginning of 2009 to the end of 2019 for asset sell-offs completed in the European Economic Area.

This study contributes to both finance and strategic management research by evidencing that strategic asset sell-offs lead to higher operational cash flow performances and profitability. Conversely, the results for shareholder values appear contradictory since statistical analysis lacks robust results as these contradict the conclusions of the descriptive analysis. Additionally, the results imply that the relative size of asset sell-off is an irrelevant factor in determining the magnitude of changes in economic performance.

The realignment with a cost reduction strategy generates more immediate and tangible results than strategies aiming to facilitate revenue growth. Thus, it appears that redeploying resources and capital so that they are also reflected in other financial figures than profitability metrics takes more time than the sample period covers. Furthermore, divesting technology companies show significant improvements in asset productivity, measured by cash flow performance, compared to the technology sector benchmark. Jointly, these results suggest that voluntarily implemented asset sell-offs bolster operational competency through improved technological relevance as capabilities and resources can be managed more efficiently.

Keywords: corporate divestiture, asset sell-off, corporate strategy, value creation, realignment, synergy

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Tiivistelmä

Teknologiasektorin yhtiöt joutuvat arvioimaan käytössä oleviaan resurssejaan ja omaisuuseriään proaktiivisesti pystyäkseen vastaamaan kilpailuympäristön transformatiivisten trendien tuomiin mahdollisuuksiin ja haasteisiin yritysjärjestelyjen kautta. Ottaen huomioon muutosten tyypillinen nopeus, korostunut arviointitarve omaisuuserien kyvystä tuottaa arvoa nyt ja tulevaisuudessa on lisännyt divestointien merkitystä keinona pitää fokus ydinliiketoiminnan ja pitkän aikavälin arvonluonnin ympärille rakentuvissa kasvustrategioissa.

Myyntitransaktioista saatavat varat mahdollistavat uusiin mahdollisuuksiin mukautumisen myös teknologiayhtiöille, joille pääomien hankinta on haasteellista korkeiden kustannusten vuoksi. Sen lisäksi, että myyntitulot mahdollistavat paremmin arvoa tuottavien uudelleenallokointipäätösten tekemisen, yritysten tulisi pystyä parantamaan kilpailuasemaansa, taloudellista suorituskykyänsä ja omistaja-arvon luontia divestoimalla omaisuuserät, joiden maksimaaliseen hyödyntämiseen ei ole olemassa edellytyksiä.

Rahoituksen ja strategisen johtamisen teorioiden ja empiiristen löydösten motivoimana tämä tutkielma keskittyy tarkastelemaan suhdetta omaisuuserien myynnin sekä taloudellisen suorituskyvyn, että omistaja-arvon luonnin välillä. Tässä tutkielmassa tutkitaan vuosien 2009 – 2019 aikana Euroopan talousalueella toteutettujen strategisten omaisuuserien myyntien vaikutuksia julkisesti noteerattujen teknologiayhtiöiden operatiiviseen kassavirran tasoon (*engl. cash flow performance*), kannattavuuteen ja omistaja-arvon luontiin.

Tämä tutkielma osallistuu sekä rahoituksen että strategisen johdon tutkimukseen osoittamalla, että strategiset omaisuuserien myynnit johtavat korkeampaan operatiivisen kassavirran tasoon ja kannattavuuteen. Omistaja-arvoon liittyvän tilastollisen analyysin tulokset osoittautuivat epäluotettaviksi ja ristiriitaisiksi täydentävän analyysin kanssa. Lisäksi tulokset viittaavat siihen, ettei omaisuuserien myynnin suhteellinen koko ole olennainen tekijä divestoinnin taloudellisten vaikutusten määrittäjänä divestoivan teknologiayhtiön näkökulmasta.

Kokonaisuudessaan strategisesti divestoivien teknologiayhtiöiden operatiivisten kassavirtojen taso ja omaisuuserien tuottavuus paranee merkittävästi verrattuna koko teknologiasektoriin. Kustannusalennusstrategiaa hyödyntävät liiketoimintaportfolion yhtenäistämiset tuottavat kuitenkin välittömämpiä tuloksia kuin liikevaihdon kasvuun tähtäävät strategiat. Näin ollen resurssien ja omaisuuserien uudelleenjärjesteleminen niin, että sen vaikutukset näkyvät merkittävästi muissakin taloudellisilla osa-alueilla kuin kannattavuudessa, vie aikaa enemmän kuin tutkimuksen tarkastelujakson pituus kattaa. Tulokset yhdessä viittaavat siihen, että vapaaehtoisesti toteutetut omaisuuserien myynnit edesauttavat operatiivista kompetenssia pitkällä aikavälillä, koska kyvykkyyksiä ja resursseja kyetään hyödyntämään ja hallitsemaan paremmin.

Avainsanat: divestointi, omaisuuserän myynti, yritysstrategia, arvonluominen, yhtenäistäminen, synergia

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1 INTRODUCTION

1.1 Motivation

The field of M&A research has attracted substantial interest from academics and practitioners. However, despite the extensive research, mechanisms related to value creation remain unclear as the perspective on measuring performance lacks consensus. Particularly, value creation mechanisms of corporate divestitures remain unclear as studies have mainly treated them as side issues or mirror images of merger and acquisition transactions. Despite the rich research context of corporate divestitures for different approaches, studies focusing on the buyer's perspective have achieved a more prominent position than those focusing on the seller's perspective. (Brauer 2006.)

Regardless of the relatively minor interest in investigating corporate divestitures, two separate domains of corporate divestiture research with divergent approaches have emerged over the decades. First, the finance literature focuses on value creation by investigating stock market reactions to divestiture announcements and reactively resolving issues associated with corporate performance. Secondly, the strategy literature treats divestitures as a proactive strategic tool for value creation. Most of the finance research related to corporate divestitures was conducted before the turn of the 21st century. As the adoption of corporate divestiture practices shifted towards being more voluntary and proactive after the 2008 global financial crisis, the value creation mechanisms also changed (Alexandridis et al. 2017). Therefore, research on corporate divestitures requires a novel contribution.

Corporate divestiture is defined as the disposal of a company's assets using different techniques to realign the portfolio of assets and adjust the ownership structure (Brauer 2006; Brauer & Wiersema 2012). After the global financial crisis, corporate divestitures, covering spin-offs, equity carve-outs, and asset sell-offs, became a valuable part of corporate strategy. Particularly, asset sell-offs have become a valuable tool for technology companies to manage their growth opportunities by reshaping business portfolios since technology's exponential growth is stimulating continued economic, political, and social disruption and transformative trends (e.g. Coltman et al. 2015; Wu et al. 2015; Denning & Lewis 2017; Luftman et al. 2017).

The fast-paced and ever-changing competitive environment requires efficient capital allocation and dynamic capabilities, such as creating and deploying new resources through realigning tangible and intangible assets, to achieve and sustain competitiveness (Teece 2007). Particularly, to respond to new trends and threats, technology companies must frequently evaluate their strategies and business portfolios, knowing the present and long-term value creation potential of each asset, to protect the long-term financial performance. Corporate divestitures provide an opportunity to reshape the portfolio of assets to core competencies, improving a company's value creation potential. Based on the above, corporate divestitures are arguably not merely reversed merger and acquisition transactions since divestitures are highly complex and counterintuitive transactions presenting one of the greatest complexities executives face among their strategic decisions.

In M&A literature, the concept of value creation is often associated with synergy, the additional value resulting from combining two companies (Damodaran 2006, 1013). For instance, technology companies can create synergies through knowledge acquisitions. Through this leverage, their core competencies as shared knowledge are sources of synergy and competitive advantage (e.g. Yli-Renko et al. 2001; Bena & Li 2014). Strategic transactions are often justified with synergies, whereas the absence of synergies should be sufficient rationale for disposal, even if the target is a steady cash flow asset supporting current operations.

Asset sell-offs result in cash flow alteration since cash flows associated with the asset to be sold are exchanged for cash flow from the acquirer. Proceeds from the transaction may solve the liquidity constraints of intangible-intensive technology companies when raising external capital for investments is non-viable due to the high costs (Lang et al. 1995; Carpenter & Petersen 2002). Thus, asset sell-offs enable realigning business portfolios by selling unrelated assets and using the proceeds to acquire assets that are more valuable in a company's use (Hite et al. 1987).

Regarding divestiture analysis, rationalizing divestitures based on cash flows is uniform with investments as both are based on net present value (*NPV*) calculation on a discounted cash flow (*DCF*) basis combined with the sum of the parts approach (Boudreaux 1975; Berger & Ofek 1995; Damodaran 2012, 871). However, justifying value creation through divestitures appears burdensome since executives often hesitate to allocate assets to better

value-creating prospects (Koller et al. 2015, 623). The traditional analysis approach appears insufficient to convince management to divest since value creation mechanisms appear to remain unclear even for professionals as research on M&A and value creation remains of interest.

The decision to divest is not necessarily a matter of hesitation if it requires admitting mistakes, which often involves a personal cost to management as the divestiture may adversely affect perceptions of management competencies (Boot 1992). Avoiding value-maximizing divestiture decreases the potential shareholder value, increasing agency costs (Jensen & Meckling 1976). Furthermore, companies tend to focus on creating and acquiring new businesses and refining ongoing operations rather than considering realigning the business portfolio. Ultimately, regardless of management's efforts to avoid a divestiture decision, underperforming assets tend to be sold too late. As Porter (1976) argues, unsuccessful attempts at turnaround and gratuitous losses can be avoided if underperforming assets are sold in accordance with strategy. Harrigan (1981) further supports this statement by arguing that decisions to divest should always originate from corporate strategy.

Due to the numerous rationales to dispose of assets, the impact mechanism of divestitures is not only multidimensional on financial performance but also shareholder value since shareholders are a company's residual claimants experiencing increased or decreased returns if the company value changes (e.g. Schipper & Smith 1983; Lang et al. 1995; John & Ofek 1995; Campa & Kedia 2002; Sirmon et al. 2007; Chen & Feldman 2018). However, corporate divestitures are divided into three groups according to their nature. Firstly, voluntary divestitures are analyzed opportunities that are mainly implemented in accordance with strategy. Secondly, reactive divestitures occur in reaction to financial pressure. Finally, involuntary divestitures occur without the will of management, for instance, to comply with regulatory requirements.

Restructuring the business portfolio through asset sell-offs to obtain the assets to exploit the technology sector's opportunities, such as the link between value creation and reallocation in a dynamic environment, requires further investigation. The combination of finance and strategic literature raises the question of whether strategic business portfolio realignment could improve a technology company's financial performance and shareholder value.

1.2 Research objectives and structure

The focus of this study is confined to examining and analyzing the impacts of strategic asset sell-offs on a divesting technology company's actual financial performance and shareholder value. Simultaneously, the study aims to contribute to the research concerning technology companies' business portfolio realignment as a means of value creation, studies on the long-term financial impacts of corporate divestitures, and relatively scarce M&A research from the seller's perspective compared to the buyer's perspective.

The research objectives of this study are to analyze and investigate financial performance and shareholder value in pre- and post-asset sell-off periods to determine the extent to which strategic asset sell-offs impact a divesting technology company's financial performance and shareholder value. The research objectives are investigated through an empirical analysis using a cross-sectional regression estimation process for the data, which comprises asset sell-offs completed during and after the global financial crisis in the European Economic Area. The terms *business portfolio* and *portfolio of assets* are defined as the set of productive assets the company leverages to pursue strategic goals. The terms are used interchangeably in this study.

Financial performance is defined as the company's ability to collect and allocate capital efficiently as the financial performance captures the company's financial outcome for a certain period (Waddock & Graves 1997). The impacts of asset sell-off on financial performance are studied by examining the changes in cash flow performance and profitability estimated by the changes in cash flow returns (*CFRs*) and EBITDA-to-sales ratio, that is, the EBITDA margin. The company's *CFRs* are compared to the sector-adjusted median *CFRs* to detect potentially abnormal sector-adjusted *CFRs*. Furthermore, additional analysis regarding the interest coverage ratio (*ICR*) is conducted.

The shareholder value is defined as the present value of future expected cash flows delivered to the shareholders of a company (Doyle 2008, 22). The impacts of asset sell-off on shareholder value are estimated by the changes in the market value added (*MVA*) metric. Moreover, additional analysis regarding market expectations measured by changes in the enterprise-value-to-EBITDA ratio (*EV/EBITDA*), enterprise-value-to-sales (*EV/S*) ratio, and price-to-earnings (*P/*E) valuation ratio is conducted.

The asset sell-off data cover the period from 1st January 2009 to 31st December 2019. The period of data for financial and shareholder value measures is from 1st January 2005 to 31st December 2020 as measures and ratios are calculated for prior- and post-periods of asset sell-offs. The estimation periods comprise 4-year pre- and post-asset sell-off periods. The estimation is conducted with annual adjustments to the MVA, CFR, and sector-adjusted CFR measures since they include a variable market value component. In addition to detecting potentially abnormal cash flow performances, adjustments regarding sector-adjusted CFRs are conducted to solve problems concerning the technology sector and economy-wide and company-specific changes.

The variables used in cross-sectional regression and all the adjustments to improve the quality of this study are chosen based on previous research on M&A performance and value creation (e.g. Kaplan 1989; Healy et al. 1992; John & Ofek 1995; Daley et al. 1997; Hillman & Keim 2001). Additionally, some of the measurements in an additional analysis are also selected to consider the latest business models of the technology sector, which occasionally indicate a weak relationship between valuation and accounting profitability.

Other widely used methodologies, such as the event study methodology, and variables, such as the return on equity (*ROE*) and return on assets (*ROA*), are not considered as they have proven conflicting measures of long-term performance or value creation in intangible asset-intensive sectors such as the technology sector due to the lower earnings quality and incomplete recognition of intangible assets (e.g. Lyon et al. 1999; Lev & Zarowin 1999; Brynjolfsson & Hitt 2000; Youndt et al. 2004; Srivastava 2014). However, it should be considered that most of the available research arguing that the lower earnings quality is caused by intangible assets is conducted using samples comprising companies reporting under U.S. GAAP.

The remainder of this research is organized as follows. Section 2 begins by introducing the concepts and methods relevant to capital allocation and financing. Thereafter, the section introduces the empirical evidence of the conducted finance and strategic management research related to the impacts of corporate divestitures on different aspects of corporate performance. Short-term and long-term value creation is then discussed from different perspectives, followed by the discussion of valuation methods and the link between market expectations for technology companies and valuation. Section 3 covers the agency problem, blockholders, and an ideology of shareholder activism and its

implications for corporate divestiture activity. Additionally, the progress of global activist investor activity in the technology sector and activist campaigns in Europe is discussed.

The empirical section is divided into three parts. First, the practical aspects and choices regarding the data and techniques are introduced in Section 4. Additionally, the data are illustrated by displaying and discussing the geographical and subsector classification together with the annual activity and geographic scope of asset sell-offs. Second, Section 5 presents and discusses the implications of the primary results and additional analysis. Finally, Section 6 concludes the findings and guides future research.

2 CORPORATE DIVESTITURE AND VALUATION

2.1 Capital allocation and financing

Among the most important corporate finance questions is understanding how companies finance their investment opportunities. According to the pecking order theory, internal funds are prioritized as a source of financing, and if external funds are needed, debt financing is preferable to equity financing. However, companies with volatile market value use less debt financing since the probability of default on debt is higher; therefore, debt financing is more costly. Moreover, companies holding tangible assets use more debt financing as tangible assets can be pledged as collateral and sold to meet the debt payments. Thus, the possibility of financial distress increases the cost of debt financing for intangible-intensive companies since the value associated with intangible assets is not monetizable. (Myers 1984.)

If debt financing is not a viable option, positive NPV investment is financed by equity financing when shares are valued above their intrinsic value (Myers 1984). As management has private information and shareholders have only expectations about this information, this may occasionally cause valuation errors. Consequently, a company's market value is calculated as follows:

$$V_o = V_c + E(V_p),$$

where V_o is the company's current market value, V_c is the value from publicly available information, and $E(V_p)$ is the expected value of management's private information. Then, the intrinsic value is

$$V_\tau = V_c + V_p,$$

where V_τ is the intrinsic value and V_p is the true value based on management's private information. Therefore, the company is overvalued if $E(V_p)$ is greater than V_p and undervalued if $E(V_p)$ is less than V_p. (Bayless & Chaplinsky 1996.)

Therefore, management issues equity only when equity is overvalued

$$NPV_j \geq V_\tau - V_o,$$

where NPV_j is the *NPV* of investment opportunity j. When shareholders undervalue the expected value of management's private information, asymmetric information about the company's positive outlook causes shares to be undervalued, risking the company ignoring value-creating opportunities, causing underinvestment problems (Myers 1977; 1984). However, regardless of overvaluation, the theory predicts that companies are often reluctant to use equity financing to fund investments since this leads to shareholders revising the estimate of $E(V_p)$ downwards, causing the share price to drop (Myers & Majluf 1984; Bayless & Chaplinsky 1996).

The *NPV* of investment *j* used in equity issuance decisions is calculated on a *DCF* basis as from a cash flow aspect; the investment outlay subsequently increases future operating cash flows and therefore increases the company value. Investment *j*'s internal rate of return (*IRR)*, R_j, is defined as the rate of discount such that the following equation holds:

$$C_0 = \sum_{t=1}^{T} \frac{v_{j,t}}{(1+R_j)^t},$$

where C_0 is the investment outlay required to pay at present, $v_{j,t}$ is the investment's expected net cash inflow after tax at time t, and T is the economic life of the investment (Hsiao & Smith 1978). As the *IRR* equals the investment outlay, the NPV is zero.

If R_j exceeds the company's cost of capital, δ, the present value of the investment's cash flows calculated using the cost of capital as a discount factor is as follows:

$$PV_j = \sum_{t=1}^{T} \frac{v_{j,t}}{(1+\delta)^t},$$

where PV_j is the present value of investment *j*'s cash flows. Then, the initial negative investment outlay is added to find the NPV of investment *j*,

$$NPV_j = -C_0 + PV_j > 0.$$

If the condition holds and the investment's NPV is positive, the investment is accepted and compared to another positive NPV investments (Myers 1974; Brealey et al. 2016.)

The after-tax cost of capital incorporating both the cost of debt and cost of equity is called the weighted average cost of capital (*WACC*). As the WACC considers the company's obligations to creditors and shareholders, it represents the required minimum rate of return on investments. Since after-tax cash flows are used in NPV calculations, the WACC must be adjusted to consider taxes, and this is calculated as

$$WACC_i = \delta_i = (1 - \tau) r_d \frac{E_i}{V_i} + r_e \frac{D_i}{V_i},$$

where τ is the corporate tax rate, r_d is the cost of debt, r_e is the cost of equity, D_i is company i's book value of debt, E_i is company i's market value of equity, and V is company i's current market value. The $WACC_i$ applies only if the investment has a comparable risk to the company's current business portfolio as the opportunity cost of capital is otherwise not comparable (Myers 1974; Brealey et al. 2016).

The cost of debt, r_d, is the blended interest rate on outstanding debt. The cost of equity, r_e, is estimated using the capital asset pricing model (*CAPM*), according to which r_e is a linear function of systematic risk,

$$r_E = \gamma_0 + \gamma_1 \beta_i,$$

where γ_0 is the risk-free interest rate, γ_1 is the market's expected return minus the risk-free interest rate, and β_i is the beta measuring volatility associated with company i's equity's market value, such as systematic risk, compared to the market's volatility (Fama & French 2004). Since companies can have assets diversified in different industries and sectors with different betas, beta should be calculated for each segment within a company. Therefore, a company's beta is a weighted average of segmental betas, and this is calculated as

$$\beta_i \cong \sum_{k=1}^{N} w_{ki}\, \beta_{ki},$$

where w_{ki} is segment k's equity weight from the total market value of company i's equity, β_{ki} is segment k's beta, and N is the number of segments. (Fuller & Kerr 1981.) The use of a single beta within companies tends to lead to value-reducing investment decisions as valuation is flawed. As the WACC is a measure of risk, insufficient adjustment for

segment-specific risks causes the values of risky investments to be overestimated and those of low-risk investments to be underestimated. (Krüger et al. 2015.)

The fundamental shift from tangible-intensive balance sheets to intangible assets that do not appear on balance sheets has posed a challenge for new types of companies to finance their growth opportunities (Sun & Xiaolan 2019). The predictions of the pecking order theory are continuously violated as the theory allows the use of equity financing only if equity is overvalued due to information asymmetries. However, companies currently use equity issues without information asymmetries (e.g. Fama & French 2005, Sun & Xiaolan 2019).

Nevertheless, equity financing is the predominant source of funds when investments are made in intangible assets, internally generated growth opportunities, and with asymmetric information (Gatchev et al. 2009). Regarding technology companies, the probability of defaulting on debt is high since returns on technology investments are generally uncertain. Some investments, such as those in research and development (*R&D*), have no monetizable value as investment expenditures comprise personnel costs. Moreover, vast information asymmetries exist between high-technology companies and investors as investments in technology are difficult for outsiders to assess (Carpenter & Petersen 2002). Moreover, a technology company may appear more leveraged than it actually is since accounting measures do not incorporate intangible assets sufficiently, increasing the company's cost of capital (Chan et al. 2001).

As Myers (1984) argues, the pecking order theory is not an all-encompassing framework for financing. For instance, in the context of the theory, increasing cash reserves through retaining asset sell-off proceeds for finance investments can be efficient when this is the most affordable source of funds (Lang et al. 1995). Nevertheless, although the theory does not recognize asset sell-offs as a viable option for financing, the use of proceeds for financing remains consistent with the basic principles of pecking order theory as the cash flow from asset sell-off is an internal source of funds. This is significant for shareholders as asset sell-offs often increase liquidity, similarly to free cash flow from operations. Increased liquidity can then be reallocated to the unfunded projects. (Bates 2005.)

Furthermore, asset sell-offs can be fundamental when the investment made may prove to be outside the company's core competencies or the asset value may alter due to industry-wide changes and thus create incentives to allocate assets to more value-creative uses

(Maksimovic & Phillips 2001). Myers (1977) argues that companies constantly compare the current NPVs of assets employed to their prospective selling prices. The asset sell-off is a rational decision if

$$V(s) < S + D, \tag{1}$$

where $V(s)$ is the asset's value to the seller, S is the prospective selling price, and D is the aggregate of debt payments related to the asset. If the condition in Equation 1 is true, selling assets to the market creates more value than holding them. (Myers 1977.)

Asset sell-offs can be used to allocate assets to higher valued use if the assets are in the core competencies of another company. Thus,

$$V(s) < V(b), \tag{2}$$

where $V(b)$ is the asset's value to the buyer. The condition in Equation 2 may be true, for instance, if the seller does not have the required knowledge of assets to fully exploit their growth opportunities while the buyer does. Therefore, a buyer with the required resources may acquire the asset at a purchase price exceeding what the asset is worth to the seller. Moreover, as Jensen (1986) argues, a buyer with large free cash flows may merely overpay for the asset; thereby, the purchase price exceeds the received value:

$$P(b) > V(b),$$

where $P(b)$ is the purchase price paid by the buyer (Hearth & Zaima 1984). From the seller's perspective, the proceeds can be reallocated to improve corporate focus, that is, the level of the business portfolio's asset relatedness and better management of the assets, through selective asset acquisitions.

One remaining puzzle in corporate finance concerns why the asset sell-off and M&A activity generally vary over time and across industries (Yang 2008). However, it is known that asset sell-off activity increases at times of industry-wide changes as positive demand shocks make it easier for the seller to find an appropriate buyer; therefore, assets can be sold at prices close to their NPVs as the market is more liquid. Furthermore, assets are primarily allocated to more value-creative uses as most reallocations result in productivity gains (Maksimovic & Phillips 2001; Schlingemann et al. 2002.)

2.2 Performance rationales

Existing divestiture research has provided two rationales to divest voluntarily. Firstly, strategic divestitures are often associated with portfolio restructuring as they enable a change in strategic focus through the alignment of business portfolios with core competencies (Hovakimian & Titman 2006). As Gibbs (1993) shows, horizontal integration through selective core asset acquisitions will probably occur following strategic asset disposals. Secondly, asset sell-offs provide a source of funds when debt and equity financing are unattractive due to high costs (Hovakimian & Titman 2006).

Corporate divestitures were gradually incorporated into corporate strategies when the dynamics of the competitive environment started to shift through accelerated globalization and the technical revolution. Simultaneously, strategic discontinuities and voluntary divestitures started to develop into an interest in strategic management research when it was evident that the complexity originating from more dynamic competition increased the priority of company restructuring, dynamic core competence development, and effective employment of resources to build and maintain strategic flexibility and competitive advantages. (Bettis & Hitt 1995; Hitt et al. 1998.) As Zahra and Bogner (2000) argue, technology strategy is a core aspect of a company's strategic posture in a dynamic environment such as the technology sector. Bharadwaj et al. (2013) use the term digital business strategy from combining corporate and technology strategy; this is defined as a formulated and executed strategy leveraging digital resources to create value and improve financial performance.

The strategic realignment of technology assets appears to positively affect different aspects of corporate performance. The evidence provided by Kearns and Sabherwal (2007) shows that cooperation between business and technology managers in strategic information technology and business planning positively impacts a company's IT governance, such as the framework aiming to improve value from IT portfolio management, promoting the company's overall performance. Luftman et al. (2017) show that the alignment of the technology portfolio with business goals significantly impacts the ROE and ROA measures, explaining 15 % of the sample's financial performance measured by accounting figures. Tanriverdi (2006) shows that complementary IT resources create cross-unit synergies, improving financial performance and positively impacting market-based value measures. Oh and Pinsonneault (2007) show that the

strategic alignment of technology portfolios and business strategies results in first-rate profitability compared to a low-end alignment. The link between the empirical evidence of the above-mentioned studies and the realignment is illustrated in Figure 1.

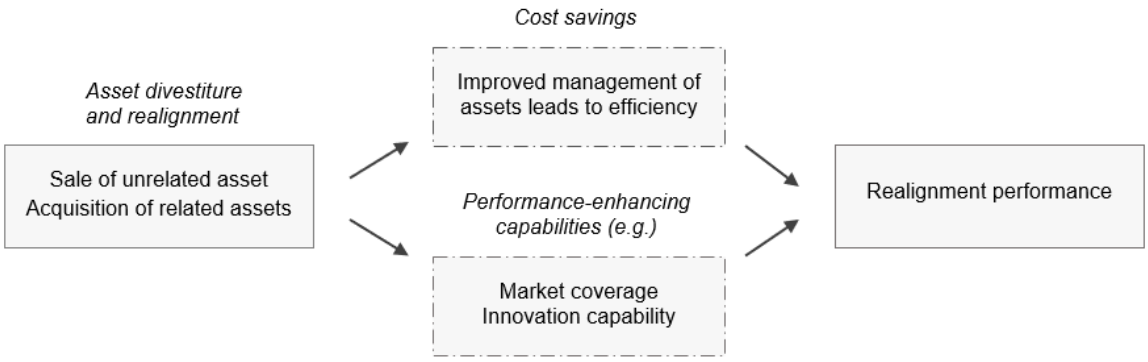

Figure 1: The link between realignment and performance (Adapted from Capron 1999)

While the strategic management research introduced corporate divestiture as a strategic tool focusing on the concept of enhanced performance and efficiency through dynamic realignment as illustrated in Figure 1, the finance research observed divestitures from a contrary perspective, focusing on short-term shareholder value creation and the model of financial pressure without dynamic elements. By investigating divestiture announcements, Rosenfield (1984) shows that the capital market tends to react positively to announcements if underperforming assets are the primary reason for the disposal. Hite et al. (1987) further support short-term value creation effects of divestiture announcements by providing empirical evidence of statistically significant abnormal returns on the announcement day. They argue that their findings are associated with more efficient capital allocation.

Focusing on financial performance and financial pressure, John et al. (1992) show that reactive divestitures increase profitability and reduce debt to asset ratios of financially constrained companies. Regarding corporate focus, John and Ofek (1995) and Daley et al. (1997) propose that disposing of unrelated assets increases focus, leading to an enhanced capability to deliver value to shareholders and improve long-term profitability. Bergh et al. (2008) identify that the financial outcome of divestitures partly depends on how the disposal is implemented as information asymmetries between management and

the market are mitigated most efficiently through spin-offs when assets are related and by reallocating assets to more valuable uses through asset sell-offs when assets are unrelated.

The finance research introduces increased efficiency and focus and improved access to finance as the three most prominent rationales for reactive divestitures (Schlingemann 2002). These rationales are consistent with the concepts of the behavioural theory of the firm, arguing that companies are rationale systems responding to antecedent company performance (Cyert & March 1963, 99 – 100). As Koller et al. (2015, 623) argue, the use of corporate divestitures remains mainly reactive to technological, financial, and regulatory pressure.

Focusing on technological aspects, Borisova and Brown (2013) show that corporate divestitures increase the R&D investments of financially constrained companies. Regarding financial performance, Dittmar and Shivdasani (2003) show that the increased focus of diversified companies after divestitures improves capital allocation as the funds received from divestitures solve underinvestment problems. Schlingemann (2002) evidences that companies are more likely to divest if the market for divested assets is liquid and the divested assets are underperforming, small, and unrelated. Also considering financing, Lang et al. (1995) show that companies selling off assets are underperforming, in a weak financial position, or both. From an information asymmetry perspective, Krishnaswami and Subramaniam (1999) show that companies use more equity financing following corporate divestiture as this alleviates information asymmetries between management and the capital market.

Combining the corporate divestiture rationales from finance and strategic management research is meaningful as strategic assets that once had synergies with the core competencies may start underperforming due to industry-wide shocks and changes in economic conditions (Mitchell & Singh 1996; Mulherin & Boone 2000; Maksimovic & Phillips 2002). Kaplan and Weisbach (1992) argue that acquired assets could have initially increased shareholder value and financial performance despite currently underperforming. Barney (1995) states that management must constantly evaluate the long-term value creation potential of assets and capabilities.

Exhausted growth opportunities of deployed assets might cause the pursuance of diversification strategies, leading to acquiring unrelated assets. However, strategic business portfolio alignment through divestitures would maintain corporate focus and

improve performance (Lang & Stulz 1994). Companies employing value-reducing diversifying strategies are more likely to become targets of hostile takeovers and eventually divest underperforming assets as corporate takeover defences or as a part of post-takeover restructuring (Mitchell & Lehn 1990; Berger & Ofek 1996).

2.3 Value creation

The purpose of finance is to create value, and value creation is fundamental to every company's strategic success. Aligning assets to core competencies enables a company to deliver unique value not only to shareholders but all stakeholders, even if the ultimate purpose of the company and corporate governance is to deliver maximal shareholder value. Value creation is currently not limited to maximizing short-term performance measures such as earnings per share since increasing responsibilities to employees, customers, suppliers, and the environment has shifted the focus to a long-term perspective. Thus, a deeper understanding of value creation needs a multilevel perspective as different amounts of value are created and captured at different levels.

For instance, Teece et al. (1997) state that competitive advantages and value are created by coordinating and combining processes shaped by the company's asset positions and paths that allow the integration, building and reconfiguration of internal and external competencies. As identifying new opportunities arising from rapid technology changes and adjusting to them enables superior value creation for all stakeholders, focusing on realigning business portfolios to core competencies in value creation is essential. Technological changes offer an opportunity to create and maximize value creation for new and existing customers. If a company's resources are aligned strategically, the company can deliver the maximum value to customers but also capture it, leading to a sustained high performance and value creation for all stakeholders (Priem 2007).

From a capital allocation perspective, decisions to allocate are not equally value-creating and risky. Therefore, every allocation alters the delivered value to stakeholders. Successfully analyzed and completed asset reallocation may increase a company's value creation with limited risks (Koller et al. 2015, 45). For instance, Hovakimian and Titman (2006) argue that asset sell-offs increase a company's investing activity as received cash flows enable investments in more valuable long-term NPV projects. From a shareholder's perspective, the downside risk, the risk of financial destruction, is limited as the proceeds from asset sell-offs are often used to acquire assets with new cash flows (Koller et al.

2015, 45). However, the level of performance of mature assets can decrease more than it can increase.

The short-term value creation of asset sell-offs depends on whether inequality in Equation 3 is true

$$P(b) - V(s) - C > 0, \quad (3)$$

where $P(b)$ is the purchase price paid by the buyer, $V(s)$ is the asset's value to the seller, and C is the cost of separation. The greater the difference between $P(b)$ and $V(s)$, the greater the increase in shareholder value (Hearth & Zaima 1984, Koller et al. 2015, 626). The evidence provided by Clubb and Stouraitis (2002) further supports this finding as they show that the profitability of asset sell-off significantly impacts abnormal shareholder returns around the sell-off announcement. The seller's share price experiences no price reaction if the difference is zero, and if the condition in Equation 3 does not hold, the value is reduced.

The difference is also dependent, for instance, on the seller's negotiating position, which is affected by the company's financial position (Hearth & Zaima 1984). As the difference between $P(b)$ and $V(s)$ depends on the difference between the asset's value to the seller and the buyer, John and Ofek (1995) evidence the seller's higher shareholder returns on the announcement when the asset is sold to a company with a comparative advantage in managing it.

The short-term value creation mechanism also depends on the arrangement, timing, and technique of an asset sell-off. Slovin et al. (1995) identify that management conducts equity carve-out rather than asset sell-offs when investors overvalue assets compared to their perception. Asset sell-offs yield significant abnormal returns of 1.9 % to the seller's shareholders when cash is used and 3 % when equity is used as a payment method, as Slovin et al. (2005) show using a data sample from 1982 to 2000. Borisova et al. (2013) show that compared to domestic asset sell-offs, cross-border asset sell-offs yield higher abnormal returns to the seller. Moreover, Brauer and Wiersema (2012) identify that companies dispose of their assets in industry-wide waves, and shareholder returns associated with divestiture waves exhibit a U-shaped pattern. Thus, early and dissipation phases of corporate divestiture waves generate most of the shareholder value associated with the wave.

The focus must be shifted to the long-term perspective of value creation to better understand short-term value creation. The resource-based theory suggests that assets have different values for different companies as the fit, that is, synergy, varies between assets in the business portfolio (Wernerfelt 1984). Negative excess value indicates value destruction and negative synergies between assets and positive excess value indicates value creation. The resource-based theory identifies two types of synergies that generate positive excess economic value. First, contestable synergy is excess economic value generated by combining competitively available scarce resources. Secondly, M&A-related idiosyncratic bilateral synergy is defined as excess value idiosyncratic to combining the transaction's buyer and seller parties' resources and capabilities. (Mahoney & Pandian 1992.)

Synergies are usually divided into operating and financial synergies by their impact mechanism. Operating synergies allow a company to gain more from assets deployed, and they are often cited as a prime motivation for changing the scope of the business portfolio (Leland 2007). Operating synergies can arise from acquiring and sharing knowledge, enabling the leverage of core competencies and increasing innovation capabilities (McEvily & Eisenhardt 2004; Bena & Li 2014).

Financial synergies can increase and stabilize cash flows and decrease the cost of capital, positively affecting NPV calculation and the WACC discount factor (Damodaran 2006, 1014 – 1015). Therefore, the magnitude of financial synergies depends on the riskiness of cash flows, tax rates, default costs, and relative size (Leland 2007). Financial synergies arise, for instance, if the corporate merger increases debt capacity, generates tax benefits, or enables the financing of positive NPV projects (Damodaran 2006, 1015 – 1016).

By acquiring and sharing unique resources and capabilities, companies can strengthen their competitive position and generate excess economic value. The resources and capabilities generating excess value are sometimes referred to as core competencies. Theoretically, they can only be achieved through synergies. (Mahoney & Pandian 1992; Gruca et al. 1997.) Unique resources that create synergies are scarce, related, valuable, and proprietary or difficult to imitate, and access to them may require M&A transactions (Barney 2014, 40). As the sources of synergy are unique, resulting in above-average performances, they provide competitive advantages (Gruca et al. 1997).

Barney (2014, 15) defines competitive advantage as a difference between the economic value created by a company and that created by its rivals. For instance, the technology sector's large shortage and allocation of skilled programmers is a recent example of scarce value-creative knowledge assets promoting the creation of competitive advantages linked to organizational knowledge and individual workers (Garousi et al. 2020; Bontis 2021).

Teece (2007) argues that due to the fast-paced and dynamic business environment, sustainable competitive advantages also require dynamic capabilities that are difficult to imitate since the company's purpose is to maximize value creation and avoid low-margin conditions in competitive markets. Dynamic capabilities are defined as creating, extending, upgrading, protecting, and maintaining the relevance of the company's assets. These capabilities can be interpreted as a capacity to proactively analyze threats and opportunities and influence them, seize analyzed opportunities, and generally maintain competitive advantages and competitiveness through realigning tangible and intangible assets. (Teece 2007.) This is consistent with Moliterno and Wiersema (2007), who argue that resource divestitures are an important part of dynamic resource management capabilities, enabling the creation of competitive advantages.

The quantity of research focusing on improving post-divestiture financial performance by eliminating negative synergies between the assets may be explained by the preceding research on the buyer's perspective showing the positive impacts of related acquisitions on financial performance (e.g. Singh & Montgomery 1987). More recent studies have started specifically investigating the link between the relatedness of technological assets and corporate performance. Technological relatedness triggers scope and scale economies in R&D and technologies deployed. For instance, Cassiman et al. (2005) investigated the fit of technological assets between M&A transaction parties, showing that complementary technologies result in increased R&D efficiency and activity following a transaction.

According to the stakeholder theory, a stakeholder is a party that can affect or be affected by the achievement of a corporation's objectives, derived from the stakeholders' conflicting claims (Freeman 1984, 33). Since corporate divestitures also concern diverging stakeholders, engaging stakeholders during M&A processes and thereby integrating their interests in decision-making affects the long-term post-transaction performance (Harrison et al. 2010; Bettinazzi & Zollo 2017). Harrison et al. (2010) argue

that stakeholder management is as important as organizational capabilities since it unlocks additional potential for value creation. However, Rogan and Greve (2015) predict that the stakeholder's response to corporate actions depends on both the history and the value of the relationship and the availability of alternatives.

A more recent stakeholder synergy perspective extends the stakeholder theory to cover the strategic dimension by arguing that strategic stakeholder management leads to simultaneous value creation for several primary stakeholders without the need to reduce the value received from any other primary stakeholder (Tantalo & Priem 2016). The more synergistic perspective is essential as competitive advantages originating from the strategic management of conflicting shareholder claimants, that is, shareholder management, are argued to be sustainable as they are associated with causal ambiguity and path dependence. (Harrison et al. 2010.)

2.4 Market expectations

2.4.1 Valuation

The capital market as a collective whole continuously forecasts financial performance and determines a consensus price for equity shares in issue. Valuing equity is not only important for listed companies but also unlisted companies, for instance when they are willing to sell corporate assets. Two broadly used approaches to estimating equity value exist, one of which is a direct approach to estimating expected cash flows and calculating present value. Second, a relative approach concerns accounting-based market multiples and comparing the values of multiples to comparable assets to obtain value. (Bhojraj & Lee 2001.) Either the first or the second approach is selected, a knowledge of accounting and taxation principles is required. Direct and relative approaches are further divided into entity and equity methods. In the entity method, the whole company is valued using the enterprise value (*EV*), and the value of equity is determined by subtracting net debt (*ND*). The bridge between these two methods is illustrated in Figure 2.

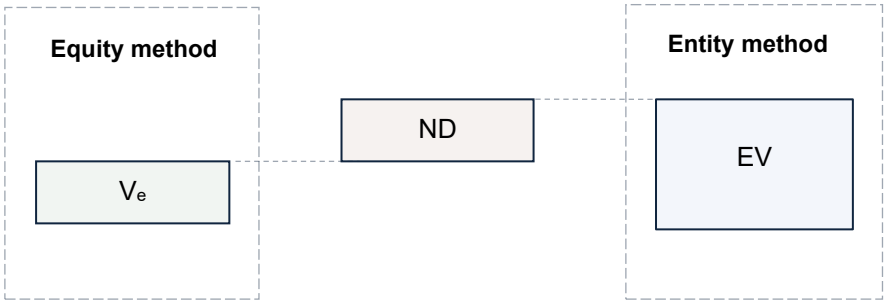

Figure 2: Equity to entity bridge (Adapted from Vernimmen et al. 2018, 555)

As Figure 2 illustrates, the equity value V_e is the remaining EV for shareholders when creditors have been paid. ND, long-term and short-term liabilities net of cash and equivalents, is added to V_e to obtain the entity value.

When applying the direct approach to the entity method, intrinsic value is obtained by estimating the present value of free cash flows using the DCF model. The method resembles investment decision-making based on the NPV. The difference compared to the investment calculation is that cash flows are projected in detail for a certain period, that is, the explicit forecast period. Thereafter, the business is presumed to grow at a constant rate. The value to be determined from the constant growth period is referred to as the terminal value. (Schmidlin 2014, 314.) For a high-technology company, the explicit forecast period can be as short as 2 years. However, for a stable utility company, it could exceed 20 years (Vernimmen et al. 2018, 557). The terminal value is calculated using a model proposed by Gordon and Shapiro (1956). The value of a company is then calculated using the following equation:

$$V_o = \sum_{t=1}^{N} \frac{FCFF_t}{(1+\delta)^t} + \frac{NFCFF}{\delta - g},$$

where $FCFF$ is free cash flow to the firm, $NFCFF$ is normalized free cash flow to the firm, δ is the WACC, and g is the estimated growth rate.

If the relative approach is applied to the indirect method, multiples are calculated using the EV as a numerator. The enterprise-value-to-EBITDA ratio is a highly suitable multiple for comparing businesses within a sector as EBITDA (*Earnings before interest, taxes, depreciation, and amortization*) is the difference between revenues and operating

costs incurred to obtain revenues, representing the capability of an underlying business to create value (Vernimmen et al. 2018, 30). The EV-to-EBITDA ratio is simply calculated as

$$\frac{EV}{EBITDA}.$$

Regarding today's business models of IT companies, it is occasionally reasonable to focus on cash flow dynamics and scalability combined with revenue multiples. For instance, software-as-a-service (*SaaS*) has a weak relationship with profitability and valuation as investments are upfront and recorded as expenses in an income statement. Thereby, investments depress the value of EBITDA, making it incomparable. Due to these investments, and particularly at the earlier stages of business, the materialization of EBITDA may take time although the underlying business is creating value. Therefore, the growth and potential are captured by the *EV/S* ratio, calculated as

$$\frac{EV}{Sales},$$

where sales equals revenue. The disadvantage of EV/S is that it does not factor profitability and therefore requires a high level of knowledge of business models and their scalability.

The link between DCF-based value and multiple-based value is that comparing these values reveals the market's expectations about the company. For instance, if multiple-based valuation estimates a company's value to be higher than the DCF-based value, the market has a more positive view of the company's financial performance and risk profile than do current shareholders and management. The equity and entity methods are distinguished according to the type of cash flow, multiple, and discount rate used. Table 1 summarizes the differences.

Table 1: Summary of direct and relative approaches

FCFE is free cash flow to equity, P/E is price-to-earnings ratio, and P/S is price-to-sales ratio.

Method	Relevant cash flow	Discount rate	Outcome	Multiples (e.g.)
Direct approach				
Entity method	FCFF	WACC	Enterprise value	
Equity method	FCFE	r_e	Equity value	
Relative approach				
Entity method				EV/EBITDA, EV/S
Equity method				P/E, P/S

As reported in Table 1, the equity method considers only cash flows to shareholders, whilst in the entity method, the cash flows of all capital providers are considered. Regarding equity multiples, the equity market value is used as a nominator. For instance, the P/E ratio,

$$\frac{P}{E} = \frac{Market\ capitalisation}{Net\ income} = \frac{Share\ price}{Earnings\ per\ share},$$

is calculated using the share price or market capitalization, both of which measure the market value of equity, V_e. Thereby, share price is divided by earnings per share, and market capitalization is divided by earnings. Regardless of the choice between these two methods, the result is the same.

2.4.2 Growth

Regarding technology companies and today's business models, valuation focuses more on a current or forward view of trading rather than a historical view. In this case, growth opportunities are usually priced in share prices. Myers (1977) proposes that the present value of future growth opportunities forms a considerable proportion of companies' current market values,

$$V_o = V_a + V_g,$$

where V_o is the company's current market value, V_a is the market value of assets already deployed, and V_g is the NPV of investment opportunities. The distinction between V_a and

V_g is based on the concept that some assets function as options since their value depends on future investments. The outstanding debt decreases when the V_g/V_o ratio increases.

The greater V_g component may indicate that a company must change the scope and scale of its portfolio of assets, for instance, in the form of knowledge acquisitions to meet the requirements of managing growth (Nicholls-Nixon 1993). Technology companies' V_g/V_o ratios tend to be high as the stock market's expectations about future opportunities to scale and grow the business are often highly optimistic. Technology shares are often inflated as no clear precedent exists for growth due to scalable business models and unpredictable growth cycles, and new fashionable technologies tend to elevate valuations even further. Historical narratives of bubbles have shown that the lack of clear precedent for growth leads to a biased extrapolation, the formation of inflated expectations based on past performance, a main driver of overvaluation (Barberis et al. 2018). Overvaluation of equity refers to a situation where the company cannot deliver the performance required to justify the current market value. Conversely, undervaluation of equity means that the performance justifies a higher market value than the current market value (Jensen 2005).

Additionally, the value of V_g is linked to nascent technologies and is thus highly uncertain. Therefore, for instance, R&D is a source of information asymmetries as the information shareholders can derive regarding R&D's true value and productivity is scarce and imprecise (Aboody & Lev 2000). Mispricing from information asymmetries exposes shareholders to the risk of significant value reduction, particularly in the event of economic distress as leveraged R&D-intensive companies suffer the greatest decline in their market value in economically distressed periods (Opler & Titman 1994). Additionally, the lack of accounting information regarding intangible assets makes equity valuation complex. Since shareholders fail to adjust valuation measures for the long-term impacts of R&D, mispricing can be severe and returns volatile (Chan et al. 2001).

Weak analyst coverage is negatively associated with the company's valuation as share price does not necessarily reflect all the information regarding V_g. Thereby, shares tend to be valued below their intrinsic value. Additionally, the capital market tends to analyze aggregated cash flows rather than segmental cash flows, causing undervaluation of the well-performing assets and overvaluation of the underperforming assets (Nanda & Narayanan 1999). Information asymmetries regarding the performances of different assets cause diversification discounts, depressing the company's value and therefore

increasing the cost of capital (Feldman et al. 2014). In this case, divestiture simplifies the accurate valuation of a company's individual assets, potentially correcting inefficient valuation. The evidence provided by Dittmar and Shivdasani (2003) shows that corporate divestiture announcements of diversified companies generate significant abnormal returns to shareholders due to the change in diversification discount.

Financial flexibility can elevate market value when a significant opportunity exists for growth. For instance, positive shocks to industry-wide demand growth and changes in economic conditions increase the asset sell-off activity as changed conditions often require adjustment (Mulherin & Boone 2000; Maksimovic and Phillips 2001; Harford 2004; Gamba & Triantis 2008). Industry-wide shocks are also associated with rivalry-based imitation, hastening the adoption of new innovative solutions to practice, promoting product improvement and positive externalities (Lieberman and Asaba 2006). However, during shocks, the information content of share prices can be muddled, leading to over- and undervaluation (Subrahmanyam & Titman 2013).

Since management aims to maximize the intrinsic value of share prices, that is, the value of the company, providing accurate information on prospects impacting V_g is meaningful since shareholder returns and company value depend on the capital market's interpretation of growth prospects within a shareholder's holding period. Therefore, shareholders' expectations about long-term earnings growth are central as they affect the valuation and cost of capital estimates (Chan et al. 2003). An increased V_g value indicates that the capital market considers the probability of the materialization of growth prospects satisfactory. If the V_g component's portion of market value is relatively large compared to peer companies, shareholders pay more for equal sales.

3 CORPORATE GOVERNANCE: ISSUES AND IMPACTS

3.1 Agency problem

Incomplete alignment of interests between management and shareholders gained academic interest through the contributions of Jensen and Meckling (1976) on agency theory and agency costs. Shareholders act as the principal delegating decision-making to management, which acts as the agent on shareholders' behalf, creating an agency relationship. Most agency relationships between management and shareholders incur agency costs as shareholders try to limit the actions diverging from their interests by aiming to maximize the value they experience. (Jensen & Meckling 1976.) Since the ideal identification of management's interests and their inclusion in contractual agreements is impossible, the risk exists that decisions diverge from shareholders' value maximization (Jensen & Meckling 1976; Jensen 2005). Diverging decisions cause residual losses representing the difference between the shareholder value-maximizing decision and the decision taken.

Agency costs generally start to increase with a reduction in management's ownership (Ang et al. 2000). The agency relationship's total agency costs comprise three components. The first is monitoring costs to detect and limit harmful activities. Second, bonding costs borne by management signal to shareholders that decisions are made in their interest as shareholders receive compensation if management acts divergently. Finally, residual loss quantifies the divergence from potential shareholder value. (Jensen & Meckling 1976.)

The balance of rights between management and shareholders is defined by the rules of corporate governance, defined as a set of mechanisms through which shareholders protect themselves against management's self-interest. Therefore, corporate governance provides a framework for minority shareholders to reduce agency costs by preventing management from engaging in projects that reduce shareholder value (Porta et al. 2000). Companies with better corporate governance and shareholder rights are more profitable, generate more value, and make fewer corporate acquisitions, as Gomper et al. (2003) show using a data sample of approximately 1,500 companies.

In a capital market with no agency conflicts, management would make only positive NPV investments and therefore use corporate divestitures and business portfolio management

to maximize shareholder value (Davies et al. 2005). However, as management does not solely own companies, management is often incentivized to maximize company value through pecuniary benefits from share option plans, ownership, and adjustments to performance-based salary since a proven relationship exists between management's ownership and financial performance. Altogether, pecuniary incentives combined with monitoring by the board of directors provide the primary internal control system for management. (Hermalin & Weisbach 1991.)

The board of directors is presented only with the investments management advocates. Therefore, the most value-creative options and thus corporate divestitures may not be presented (Graham et al. 2005). Additionally, low levels of equity ownership by the board may lead to inadequate monitoring of management (Johnson et al. 1993). Therefore, the board of directors does not necessarily challenge management with critical questions until the financial performance has suffered significantly. Thereby, underperformance leads to reactive board involvement in decision-making and reactive corporate divestitures (Johnson et al. 1993).

Agency conflict can result in the value of the company being substantially below the potential value. For instance, management's incentives to devote effort to learning about new technologies and investing in them decreases with management's equity ownership. (Jensen 2005.) Moreover, the free cash flow problem described by Jensen (1986) predicts that companies with large free cash flows are spending on value-destroying acquisitions rather than maximizing shareholder value since company size and management compensation are highly correlated. If executives are incentivized to grow and diversify the business portfolio beyond the optimal size through acquisitions since this provides an avenue for increased power and compensation, although the investments are made in negative NPV projects, corporate divestitures may be completely dismissed (Murphy 1985; Jensen 1986; Jensen & Murphy 1990; Stulz 1990).

Given the conflicts of interest between management and shareholders regarding the optimal company size, the preferences of executives are more likely to prevail if the internal control system is inadequate. As Albuquerue and Wang (2008) show, agency conflicts originating from the insufficient protection of shareholders imply higher levels of incentives for management to overinvest. Wright et al. (2002) argue that the use of loose monitoring activities explains why management's compensation increases along

with growth through acquisitions, whereas more intense monitoring activities lead to an increase in compensation only if profitability improves. Sanders and Carpenter (1998) evidence that the internationalization of a company, for instance through cross-border acquisitions, results in higher compensation for management since a larger company size increases the complexity of a business. Moreover, Denis et al. (1997) evidence that agency conflicts explain why companies maintain value-reducing diversification strategies. Thus, management pursues its personal objectives by making acquisitions decreasing shareholder value rather than divesting unrelated assets to maximize shareholder value.

Agency conflicts can also arise if a company starts to take actions to meet the capital market's performance requirements to justify the current overvalued equity (Jensen 2005). As academic research has shown, overvaluation pressurizes management to deliver on the market's expectations, leading to the use of value-reductive earnings management, defined as the use of flexible accounting principles to alter the economic performance presented in financial reports (Jensen 2005). Earnings management increases agency costs, and as Campa and Kedia (2002) argue, higher agency costs encourage management to undertake further activities conflicting with shareholder value. For instance, Leuz et al. (2003) further support previous findings, indicating that the use of earnings management increases the level of management's perquisites. However, the use of earnings management is reduced with better corporate governance, as Leuz et al. (2003) suggest that an endogenous relationship exists between the quality of financial reports and corporate governance.

Graham et al. (2005) show in their survey of 400 executives that 78 % of executives would sacrifice long-term value to achieve higher share prices by inflating earnings. The previous finding suggests that significant flaws exist in corporate governance practices. Moreover, managers seek to increase their analyst coverage, and meeting or exceeding the analyst consensus estimate, irrespective of the means, is highly important for management as it helps maintain or increase share prices. Moreover, management prefers to smooth earnings as volatile earnings are believed to command risk premiums in the capital market. (Graham et al. 2005.) For instance, management tends to time the recognition of income from asset sell-offs to make reported earnings smoother (Bartov 1993). As management focuses on earnings benchmarks over cash flows, this may partly

explain why managers are not allocating assets to the higher valued use through corporate divestitures.

Overvalued equity broadly impacts M&A activity. Erickson and Wang (1999) evidence that acquiring companies attempt to increase their share price by managing their earnings before share for share M&A transactions to reduce the purchase price of a target. Jensen (2005) argues that M&A transactions are conducted to provide the illusion of growth and deceive the capital market into believing that management is creating value. Shleifer and Vishny (2003) argue that overvalued shares are used as a means of payment in M&A transactions by companies attempting to increase returns and meet the capital market's growth expectations regarding overvaluation. Fu et al. (2011) show that acquisitions exploiting overvaluation are not associated with synergy gains as overvalued equity is used as a means of payment among the companies with the largest governance problems.

Moeller et al. (2005) evidence the agency costs of overvalued equity, showing that shareholders of the acquirers have experienced aggregated losses of 240 billion dollars for 1998–2001 around the announcement of U.S. stock-for-stock acquisitions. Moeller et al. also argue that the total shareholder value from U.S. acquisitions for 1998–2001 would have increased without large loss acquisitions with negative synergies made by highly overvalued companies. The event of overvaluation discovery leads to a disappearance of overvaluation along with some of the core business values since the compromises to avoid discovery are sometimes made at the expense of the core business.

The relationship between valuation and corporate control considerations also affects corporate capital structure policies and investment financing as management's ownership may determine the method of financing an investment. Amihud et al. (1990) argue that acquisitions are financed by cash or debt if management's ownership is large and management value their control. Equity issues would lead to dilution of management's ownership, simultaneously increasing the risk of takeover. When management's ownership is not large and equity is overvalued, companies tend to engage in negative NPV investments that shareholders believe will generate value, as Jenter (2005) argues. As theory suggests, value creation from corporate divestitures is also related to management's ownership as the high level of managerial ownership ensures that the proceeds from asset sell-offs are reinvested in a value-creative way, simultaneously

providing incentives to avoid the free cash flow problem (Jensen 1986; Jensen 1993; Hanson & Song 2003).

Regarding divestiture activity, Bethel and Liebeskind (1993) find no relationship between management's ownership and divestiture activity. The finding is consistent with Koller et al. (2015, 623), who argue that companies often hesitate to allocate assets to better value-creating prospects even without high agency costs. While the divestiture decision could also be viewed as a failed acquisition, which adversely affects perceptions of management's ability, management may be reluctant to divest underperforming assets (Boot 1992). As Hayward and Shimizu (2006) suggest, corporate divestitures are employed if the underperforming assets can be accounted for and the cause does not incriminate management.

Regarding the equity ownership between management and shareholders, greater shareholder control diminishes the difference between executives' and shareholders' interests (Gomez-Mejia et al. 1987). As Bergh (1995) suggests, higher control of active owners and boards results in higher volumes of sell-offs of unrelated assets. Conversely, Bergh (1995) also showed that when shareholders hold a lower fraction of shares, the sale of related assets occurs more frequently. It is evident that the sale of related assets reduces shareholder value; therefore, the shareholder reaction to the asset sell-off announcement tends to be negative (Montgomery et al. 1984).

The long-term plans provided by management appear to serve as a justification for shareholders to dispose of the assets. As Tehranian et al. (1987) indicate, asset sell-offs announced with long-term plans lead to a significant positive share price reaction around the announcement. Conversely, they argue that the capital market's responses to asset sell-offs without long-term plans are negative. Thus, the market views long-term plans as an opportunity to align the compensation of management with the fulfilment of long-term plans reducing agency costs. Furthermore, Clubb & Stouraitis (2002) argue that the positive impact of asset sell-off on shareholder value is greater without agency costs as shareholders expect to capture a larger proportion of the value.

3.2 Monitoring and divestiture activity

Companies confront increased organized social movements of shareholders sharing an ideology of shareholder activism, defined as monitoring and attempting to change the

control structures of companies that are not maximizing shareholder value (Davis & Thompson 1994; Smith 1996.) Activists attempt to change control structures by seeking seats on the board of directors and influencing company management. The desired changes range from changing corporate governance structures to restructuring the company. As large changes cannot be implemented without sufficient votes resulting from shareholdings, activists use corporate takeovers to take controlling stakes in publicly traded companies. Furthermore, as analyzing the company information and developing changes requires substantial time, activists tend to acquire large stakes in companies to benefit from equity appreciation following the implementation of change (Klein & Zur 2009).

Daily et al. (2003) define the market for corporate control, often referred to as the takeover market, as an external governance mechanism activated when internal governance mechanisms have failed. The participants in the takeover market value companies similarly to other parties in the capital market to identify troubled companies. Jensen and Ruback (1983) define the market for corporate control as the process of activist shareholders and financiers purchasing control of a company to effect change in the company by taking disciplinary actions against management and changing incentive structures to improve the use of resources. Martin and McConnell (1991) evidence that the takeover market is an important mechanism in reducing agency costs and correcting the value-reducing behaviour of management as the turnover rate for executives increases significantly following takeovers. In addition to pressurizing management, shareholder votes are required when parties taking control in companies are altering strategies, operations, and the capital structure using major corporate restructuring transactions, such as corporate divestitures.

One prospective factor increasing the incidence of corporate divestitures is the increased number of activist interventions globally since the last financial crisis. Hedge funds alone deployed approximately 55 billion euros of capital in activist positions with over 900 campaigns globally in 2018 (Ahn & Wiersema 2021). Simultaneously, global activist positions in the technology sector totalled approximately 7.4 billion euros with 70 campaigns. Figure 3 displays activist campaigns against technology companies worldwide between 2008 and 2020.

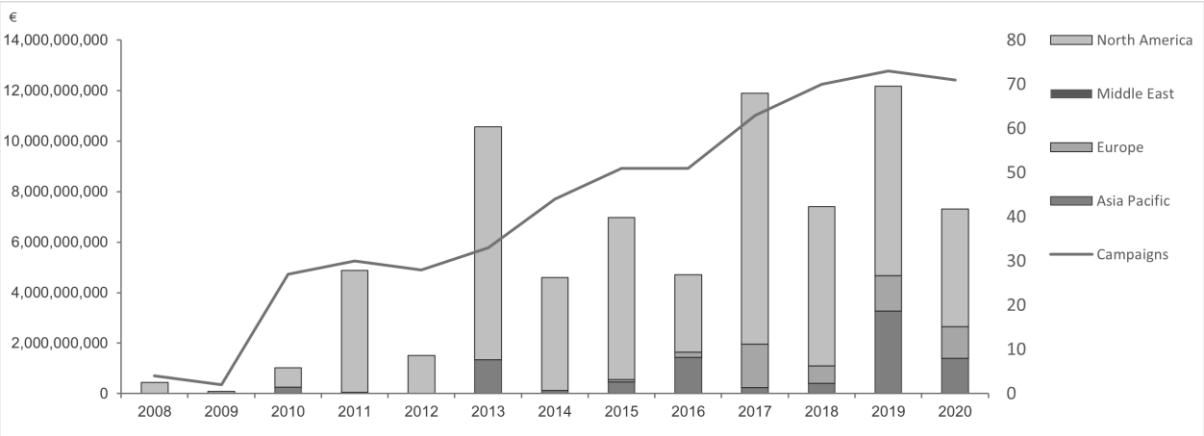

Figure 3: Global activist investor activity in the technology sector

Figure 3 displays the volume and aggregated value of globally announced activist campaigns against companies in the technology sector for 2008–2019. The data are obtained from the Bloomberg database.

As shown in Figure 3, the announced activist campaigns in North America comprised 78.6 % of all activist interventions measured by campaign volumes and 81.1 % measured by the aggregated capital in activist positions over the 13-year period. The corresponding figures for the same period in Europe are only 6.9 % and 7.4 %, respectively. However, overall campaign volumes in Europe have experienced a steep increase in the corresponding period, as displayed in Figure 4.

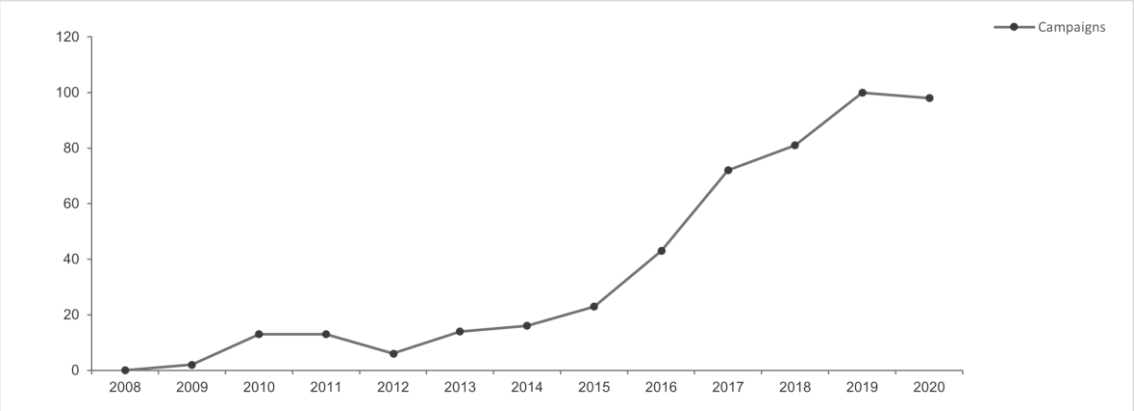

Figure 4: Activist campaigns in Europe

Based on the trend illustrated in Figure 4, it is hypothesized that Europe's activist market is becoming more crowded, with increasingly savvy European and international counterparts currently taking more hostile actions towards management than they were taking, for instance, in the 1990s (Edmans & Holderness 2017). As Chen and Feldman (2018) find, activist-impelled divestitures generate more short-term and long-term

shareholder value than divestitures initiated by management. These combined findings indicate that the increased number of activist shareholders acts as an important external governance function and initiator for major corporate restructuring in the current market environment.

The existing research on shareholder activism suggests that hedge funds have been the most significant external monitors of management of publicly traded companies up to now (Edmans & Holderness 2017). Many of the hedge fund activism studies evidence improved performance. For instance, Brav et al. (2008) show that companies subject to hedge fund activism are experiencing increases in their financial performance, shareholder value and CEO turnover. Greenwood and Schor (2009) argue that activists can improve value creation by identifying assets that can be allocated to better value-creating prospects or managed more efficiently by other managers. Clifford (2008) shows that increased operating performances and shareholder values of companies targeted by hedge funds are driven by corporate divestitures of underperforming assets. Furthermore, Brav et al. (2018) evidence that companies targeted by hedge fund activism increase their innovation output by reallocating resources, improving the board's expertise to adapt to continued disruption and cutting-edge technologies, and leveraging human capital more efficiently.

However, shareholder activism is no longer considered the sole activity of activist hedge funds as it no longer solely concerns unlocking value but also intervening in areas such as financial performance and corporate governance. Good governance correlates strongly with shareholder returns and financial performance in the long term, as Gompers et al. (2003) indicate. Blockholders, shareholders holding 5 % or more of the company's outstanding shares, have reported that they exert corporate governance practices mainly through voice, defined as any attempt to change without taking a controlling stake. Most forms of voice, such as discussions with the board of directors or management, are not observable to outsiders. (Edmans & Holderness 2017.) However, Greenwood and Schor (2009) argue that value is created most successfully if activist shareholders take controlling stakes in companies.

The threshold of 5 % ownership to classify blockholders has no theoretical justification as it is based on mandated public closure at a 5 % ownership level in many countries (Edmans & Holderness 2017). Furthermore, not all blockholders are activists as they are

a heterogeneous group of different types of parties with varying incentives and determinants. As blockholder interventions are challenging, it is improbable that some blockholders, such as pension funds and insurance companies, would engage in major changes because they lack the required skills (Edmans & Holderness 2017). Klein and Zur (2009) refer to blockholders undertaking confrontational activist actions as entrepreneurial activists comprising private equity funds, venture capitalists, individuals, and asset management groups.

Entrepreneurial activists have recently contributed significantly to divestiture activity (Bergh and Sharp 2015). Bethel et al. (1998) conclude that block purchases by activist shareholders are followed by increases in corporate divestitures, abnormal appreciation in share prices, and decreases in acquisitions. Bethel and Liebeskind (1993) show that large block purchases correlate significantly with reductions in value-reductive diversification activities. Moreover, Smith (1996) evidences that a positive relationship exists between the level of entrepreneurial blockholdings and the probability of takeover. Boyson et al. (2015) argue that activism targets are experiencing a six to eight times higher probability of being subject to takeover than companies in which the same activist shareholders have passive ownership stakes. Boyson et al. (2015) also show that takeovers increase the shareholder values of both target and bidder if an activist shareholder is undertaking confrontational activist actions in the target firm.

Antitakeover provisions (*ATPs*), actions to discourage hostile takeovers by making potential acquisition targets less attractive, are a contentious issue in corporate governance research (Drobetz & Momtaz 2020). ATPs can reduce shareholder value by protecting management from disciplinary takeovers. However, without ATPs, technology companies trading at a discount due to valuation difficulties would be exposed to takeovers aiming to exploit undervaluation (Humphery-Jenner 2014). Without ATPs, takeover pressures would shift management's focus to short-term outcomes as management may aim to correct undervaluation by earnings management and diverting resources suboptimally to maximize the short-term share price at the expense of long-term value creation (Stein 1988; Dechow & Skinner 2000; Kacperczyk 2009). Managements protected from hostile takeovers tend to have broader conceptualizations of value creation as they can also afford to consider other valuable stakeholders (Kacperczyk 2009).

While most practitioners and academics argue that ATPs are harmful to shareholders, Stráska and Waller (2010) argue that companies with certain characteristics, such as undervaluation, would benefit from adopting ATPs. For instance, as Humphery-Jenner (2014) argues, since ATPs reduce agency costs by solving underinvestment problems, this benefits technology companies as it encourages management to make value-creative asset acquisitions. Moreover, Drobetz and Momtaz (2020) show that companies with high levels of ATPs spend more on value-creating R&D related to asset acquisitions. Altogether, high-ATP companies tend to allocate capital more efficiently, invest less in absolute amounts, and react when investment opportunities change. Therefore, ATPs enable management to focus on long-term strategic objectives through business portfolio management without worrying about becoming subject to a hostile takeover.

Moreover, in the intangible-intensive technology sector, managerial myopia regarding suboptimal resource allocation is particularly substantive as the benefits of investments are visible in the long term, and investments initially depress current earnings. For instance, Dechow and Skinner (2000) point to delaying R&D expenditures as an available earnings management method, and Baber et al. (1991) evidence that R&D expenditures are significantly lower if the period's earnings risk being negative. However, blockholders have an incentive to determine the fundamental value of a company by analyzing all the information available, and they do not act on weak earnings caused by investments in intangible assets. If weak earnings are caused by weakened fundamentals, blockholders will use exit as a governance mechanism. Exit refers to selling the shares of a company if the blockholder is dissatisfied with management's performance (Edmans & Holderness 2017). Thereby, blockholders cause share prices to trade close to their fundamental value. Thus, intangible investments' impacts on earnings are mitigated, and management is not required to solely focus on the current valuation.

If management has concerns regarding the short-term share price performance, strong external governance through exit encourages management to focus more on long-term value creation (Edmans 2009). Therefore, corporate divestitures can appear viable options to management as it knows blockholders evaluate their value-creative decisions and ensure that share price reflects the fundamentals. Moreover, as the capital market has limited information about corporate divestitures, increased blockholder ownership in a divesting company before corporate divestiture announcement is interpreted as an informative signal increasing shareholders' valuation (Bergh et al. 2020).

4 METHODOLOGY

4.1 Data and definitions

The impacts of strategic asset sell-off on a divesting technology company's cash flow performance, profitability, and shareholder value are investigated through analyzing the asset sell-offs completed by technology companies headquartered in the European Economic Area. The period of the data for the completed asset sell-offs is from 1st January 2009 to 31st December 2019. This was selected because most corporate divestitures were conducted primarily as corporate governance matters before the 2008 global financial crisis. After the global financial crisis, the nature of corporate divestitures changed as many technology companies faced financial pressure leading to sell-offs of underperforming assets to maintain liquidity and growth. Since then, the focus has remained more on proactive evaluation and strategic realignment of business portfolios. The period of the data for financial performance and shareholder value measures is from 1st January 2005 to 31st December 2020 since the measures and ratios are calculated for pre- and post-asset sell-off periods.

This study is confined to examining and analyzing asset sell-off transactions whose purpose is to align the existing assets to core competencies, raise cash through disposals, generally restructure the business or operations, and strengthen existing operations. The asset sell-offs listed above are herein interpreted as strategic transactions as they are not triggered by financial or external pressure. The use of proceeds and the dates of any asset acquisitions following the asset sell-off are not considered.

The data are obtained from the Bloomberg Terminal database, and a supplemental sample of asset sell-offs is identified from the Refinitiv Eikon database. In the Bloomberg database, asset sell-off is defined as a deal with acquisition or divestiture in which a non-company or any stake in a non-company is acquired. The Refinitiv Eikon database classifies asset sell-offs under the divestiture acquisition type, defined as a single transaction technique whereby the company loses a majority interest in the target or the company disposes of assets. Due to the broader definition, the data obtained from the Refinitiv Eikon database require adjustments as the initial sample comprises all completed divestitures with different techniques and purposes. The Refinitiv Eikon database is only used to identify supplemental asset sell-off transactions that are not

recorded in the Bloomberg database, and the financial data related to the supplemental asset sell-off transactions are obtained from the Bloomberg database.

The following screens were applied to the obtained data. First, the shareholder value measurement data on the obtained companies had to be sufficiently complete and available on the Bloomberg database. Second, the financial performance measurement data on the obtained companies had to be sufficiently complete and available on the Blomberg database. Third, the purpose of the transaction information had to be available for the asset sell-offs identified from the Refinitiv Eikon database. Finally, asset sell-offs obtained from the Refinitiv Eikon database had to be completed to concentrate on core assets, strengthen operations, or raise cash through disposal. Table 2 summarizes the exclusion process for the obtained data.

Table 2: Data selection

Table 2 presents the separate selection processes of the main and supplemental samples. Cn denotes the number of companies and An the number of completed asset sell-offs.

Criteria for exclusion	Cn	An
Bloomberg		
Initial sample	135	201
Inadequate information to calculate measures and ratios	49	70
Terminated, pending, or withdrawn transactions	12	20
Main sample	74	111
Refinitiv Eikon		
Initial supplemental sample	1,594	1,998
Asset sell-off purpose not available	997	1,263
Inadequate information to calculate measures and ratios	454	499
Improper transaction purpose	96	157
Improper sector classification	10	11
Duplicate transactions	5	11
Supplemental sample	32	57
Final sample	**106**	**168**

As reported in Table 2, terminated, pending, and withdrawn asset sell-offs obtained from the Bloomberg database were also excluded. Additionally, the duplicate transactions and companies improperly assigned to the technology sector were excluded from the data obtained from the Refinitiv Eikon database.

The final sample was classified into four classes with reference to the European regions, enabling the examination of the regional asset sell-off activity in the technology sector. Table 3 summarizes the geographical classes.

Table 3: Summary of the geographical classification

Table 3 reports the geographical observation distribution of the companies (*Cn*), asset sell-offs (*An*), and aggregated deal values (*Dv*) between Western, Northern, Eastern, and Southern Europe. Deal values are presented in millions of euros. Avg. denotes the average deal value. The proportion is the relative share of the aggregated area-specific deal values of the sample's total deal value. The deal value sample comprises a total of 87 available values.

Headquartered	Cn	An	Dv	Avg.	Proportion
Western Europe			N = 65	N = 65	
United Kingdom	35	50	6,389	188	25 %
Germany	10	15	2,277	379	9 %
France	18	29	1,506	137	6 %
Belgium	2	2	10	10	0 %
Switzerland	6	9	62	21	0 %
Austria	1	3	123	62	0 %
The Netherlands	7	18	5,805	726	23 %
Total	79	126	16,172	287	64 %
Northern Europe			N = 21	N = 21	
Norway	5	8	3,469	694	14 %
Sweden	7	12	191	32	1 %
Denmark	3	3	363	121	1 %
Finland	8	15	4,092	585	16 %
Total	23	38	8,115	386	32 %
Eastern Europe					
Russia	1	1	n/a	n/a	n/a
Total	1	1	n/a	n/a	n/a
Southern Europe			N = 2	N = 2	
Italy	2	2	984	492	4 %
Spain	1	1	n/a	n/a	n/a
Total	3	3	984	492	4%

According to Table 3, most Western European asset sell-offs occurred in the United Kingdom and most North European ones in Finland. Relatively, the most active Western European divestors are in the Netherlands and most Northern European ones in Finland as their asset sell-offs per company ratios are the highest.

Subsector classes enable the investigation of the subsector-specific asset sell-off activity in the European Economic Area during the 2010s. Thus, companies are grouped into five subsector classes according to the seller industry group information available on Bloomberg Mergers and Acquisitions Data. Table 4 summarizes the subsectors.

Table 4: Deal description by subsector

Table 4 reports the distribution of the companies, asset sell-offs, and deals between subsectors. Sectors are classified according to the Bloomberg Mergers and Acquisitions Data. Deal values are in millions of euros. The available deal values for each sector listed below are 8, 29, 20, 17, and 13, respectively. The proportion is the relative share of the aggregated sector-specific deal values of the sample's total deal value.

Subsector	Cn	An	Dv	Proportion	Avg.	Median	Max
Internet	13	15	977	4 %	122	18	860
Software	37	56	3,966	16 %	137	20	2,239
Computers	34	52	2,437	10 %	116	12	1,192
Semiconductors	10	25	6,396	25 %	376	52	2,572
Telecommunication	12	20	11,494	45 %	884	311	3,790
Total sample	**106**	**168**	**25,271**	**100 %**	**287**	**31**	**3,790**

In Table 4, the largest asset sell-offs of each subsector total 3,790 million euros, comprising 15 % of the available aggregated deal values of the sample. This leaves 21,169 million euros for the remaining 82 asset sell-off transactions with available deal value.

Table 5 summarizes the descriptions of the subsectors presented in Table 4. Descriptions are formed from the company descriptions obtained from the Bloomberg database.

Table 5: Descriptions of the subsectors

Table 5 reports the descriptions of the nature of the subsector activities.

Subsector	Description
Internet	The provision of internet access services, online solutions, hosting, connectivity and cloud services, data, instant messaging networks, and customer service software
Software	The development, design, publication, distribution, maintenance, marketing, and selling of software applications, solutions, technology services, and platforms
Computers	The provision of information technology services and solutions, computer consulting, cyber security, data centres, and electronic identification products
Semiconductors	The design, manufacture, and marketing of semiconductors, silicon materials, high-technology electronic components, microelectronics, and speciality electronics used in producing semiconductors
Telecommunication	The provision of telecommunication equipment and services; mobile telephone, data transmission, and broadband services; and communications and connectivity solutions

According to Coase's (1937) theory of the firm, the size of a company depends on economic conditions. Moreover, Jensen (1993) argues that restructuring occurs to meet the requirements of technological, regulatory, and economic change. Mitchell and Mulherin (1996) supported this theory, identifying significant differences in the rate and time-series clustering of restructurings and takeovers between 51 industries. The illustration of the asset sell-off activity distribution in the technology sector in Figure 5 is motivated by these previous findings.

The number of asset sell-offs presented in Figure 5 has remained relatively stable over the period of the data. However, the average deal value of 120 million euros between 2009 and 2013 increased by 268 % to 440 m€ during the period 2014 to 2019.

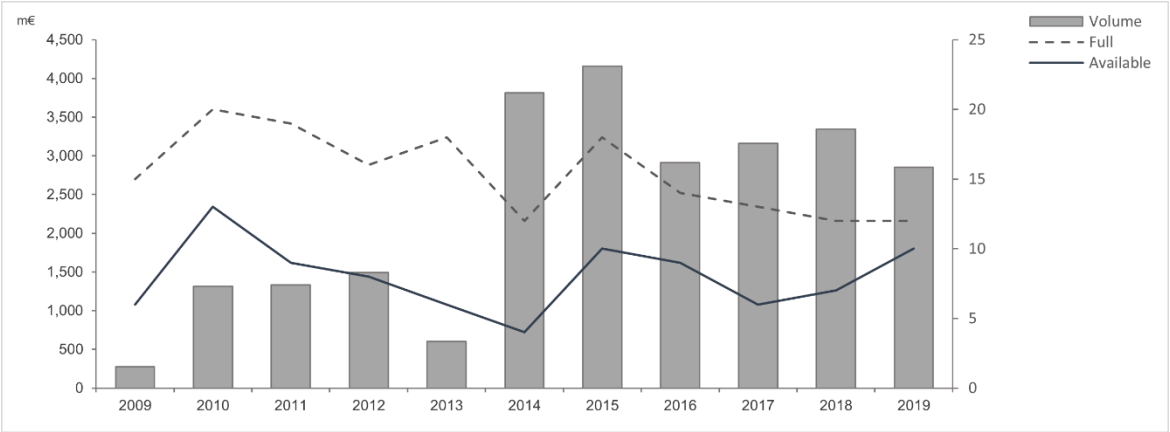

Figure 5: Asset sell-off activity by year

Figure 5 displays the volume of completed strategic asset sell-offs for 2009–2019. The deal value sample comprises a total of 87 available values representing 52 % of the final sample. Available denotes the number of asset sell-offs with available value. Full denotes the number of asset sell-offs in the final sample. Volume denotes the aggregated deal values in millions of euros.

Additionally, the median deal value of 14 million euros between 2009 and 2013 increased by 283 % to 55 m€ during the second half of the period of the data. However, as displayed in Figure 5, it should be considered that the gap between asset sell-offs with available deal values and without values narrows during the second half of the period as deal values are more available for more recent asset sell-offs.

From the foreign buyer's view, asset sell-offs may provide access to critical resources and capabilities. As discussed in Section 2.3, Borisova et al. (2013) evidenced that cross-border asset sales generate higher abnormal returns to the seller compared to domestic transactions. They argue that shareholders react positively to a company's capabilities to maintain growth and liquidity by attracting the strategic interest of global buyers. The illustration of the distribution between domestic and cross-border transactions during the sample period in Figure 6 is motivated by the previous finding.

Most asset sell-offs completed in Europe, and buyers' asset acquisitions, have been cross-border transactions between 2009 and 2019, as displayed in Figure 6.

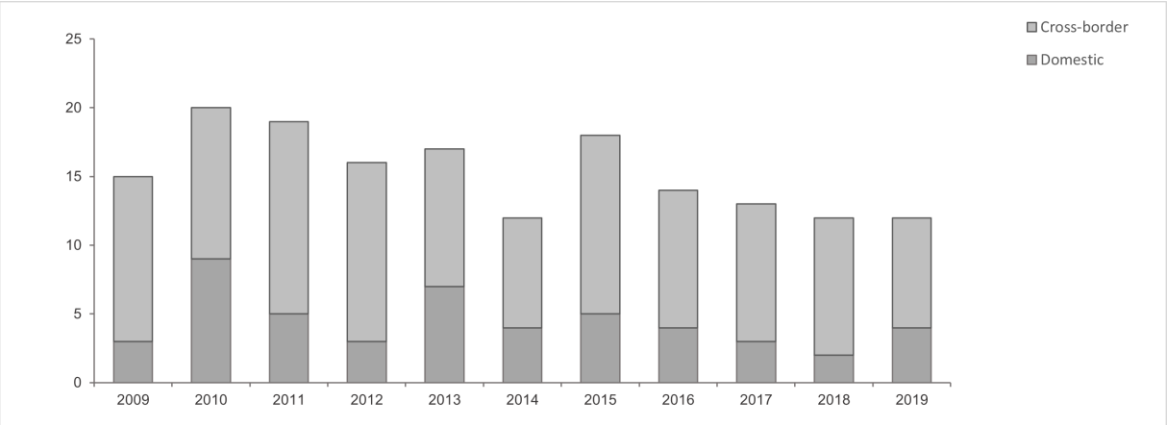

Figure 6: Geographic scope

Figure 6 displays the distribution of cross-border and domestic asset sell-offs for 2009–2019. The distribution between cross-border and domestic asset sell-offs is measured based on completed transactions as the deal value information is incomplete.

As the Refinitiv Eikon database has no separate transaction purpose categories for buyers and sellers, the transactions of the supplemental sample are strategic from the perspectives of both parties to the transaction. Therefore, a high number of cross-border transactions can be partly explained by the strategic nature of acquisition transactions aiming to bolster operational competency or technological relevance.

4.2 Measurement and hypotheses

As theories and empirical findings in finance and strategic management research indicate, disposing of unrelated assets should be associated with an improved competitive position, financial performance, and shareholder value. Additionally, previous research predicts that financial outcome varies by the relative size of corporate divestitures as it has been investigated from different aspects (e.g. Montgomery et al. 1984; Klein 1986; Bergh 1995). Hence, the aim is also to investigate whether the higher proportion of proceeds and divested assets of technology companies' market value of equity impact financial performance and shareholder value.

The following hypotheses are formulated to answer the question regarding the extent to which strategic asset sell-offs impact a divesting technology company's financial performance and shareholder value.

H_1: Strategic asset sell-offs of publicly traded technology companies headquartered in the European Economic Area increase long-term financial performance through improved cash flow performance or profitability.

H_2: The relative size of asset sell-offs impacts the relationship between financial performance and strategic asset sell-offs.

H_3: Strategic asset sell-offs of publicly traded technology companies headquartered in the European Economic Area create value for shareholders through improved *MVA* metrics.

H_4: The relative size of asset sell-offs impacts the relationship between shareholder value and strategic asset sell-offs.

As the first objective is to investigate the impact of divestiture on cash flow performance and profitability, two ratios are employed as a performance measure. The first widely used M&A performance measure, the *CFR*, or more accurately, operating cash flows *ROA*, indicates the actual economic benefit that assets have generated, enabling comparison of performance across time and companies. Healy et al. (1992) define the *CFR* as follows:

$$CFR = \frac{Operating\ cash\ flows_{\ t}}{Market\ value\ of\ assets_{\ t-1}}, \tag{4}$$

where operating cash flows are the end-of-year figure, and the market value of assets is the beginning-of-year figure since the observation must be adjusted to the prevailing market value each year to control for changes in the size of a company. Although measures based on market values have limitations due to their sensitivity to unexpected changes in cash flows, they are advantageous as accounting, financing, and tax issues can be eschewed. Moreover, cross-sectional and intertemporal comparisons are simplified as the CFR forms a comparable operational measure (Healy et al. 1992).

Operating cash flows (*OCF*) in Equation 4 are calculated as

$$OCF = Sales - COGS - SG\&A + DE + AE,$$

where COGS is the cost of goods sold; SG&A is selling, general, and administrative expenses; DE is depreciation expenses; and AE is amortization expenses. Alternatively, OCF is calculated as

$$EBITDA = OCF = EBIT + DE + AE, \quad (5)$$

where EBITDA is earnings before interest, taxes, depreciation, and amortization, and EBIT is earnings before interest and taxes. As Equation 5 shows, the inverse calculation of the CFR starting from EBIT is identical to the EBITDA calculation formula. Hereafter, OCF is referred to as EBITDA, a more widely known construct today. The CFR is then calculated by dividing EBITDA by the market value of assets, calculated as follows:

$$EV = V_o = V_e + ND,$$

where EV is enterprise value, V_o is the market value of assets, V_e is the market value of equity, and ND is net debt, that is, long-term and short-term liabilities net of cash and equivalents. As the calculation resembles the equity to entity bridge illustrated in Section 2.4, the market value of assets can also be referred to as the *EV*.

The second performance measure employed is the widely used EBITDA-to-sales ratio,

$$\frac{EBITDA_t}{Sales_t},$$

that is, the EBITDA margin. As with the CFR, the EBITDA margin allows financial performance evaluation by avoiding accounting, financing, and tax issues. As the EBITDA margin measures profitability from operations by avoiding the above-mentioned company-specific issues, it is a highly functional long-term performance measure. As it does not consider the financial position of a leveraged company, additional analysis related to changes in the interest coverage ratio is conducted since improvements in the EBITDA margin should improve the *ICR*,

$$ICR = \frac{EBITDA_t}{Net\ interest\ expense_t},$$

where the net interest expense is the interest income net of interest expenses.

The second objective of this study is to investigate the impact of asset sell-offs on long-term shareholder value. A market value added metric is employed as it measures shareholder value maximization through efficient capital allocation of scarce resources (Hillman & Keim 2001). Vernimmen et al. (2018) argue that the *MVA* metric is a more complete measure for value creation than simple share price development. The market value added for listed companies is

$$MVA = V_e + ND - CE,$$

where CE is the book value of capital employed. As with the CFR, the market's volatile feature also affects MVA, as this is how the market inevitably functions. However, as with the CFR, MVA eschews accounting and other company-specific issues (e.g. Watts & Zimmerman 1990; Feng et al. 2011; Jones 2011). Therefore, both the CFR and MVA have advantages over performance measures such as the *ROE* and *ROA* in capturing the impacts on financial performance and value creation.

As the technology sector is intangible-intensive, employing purely accounting-based measures would not generate reliable results. For instance, Brynjolfsson and Hitt (2000) show that investments in intangible IT assets have created significant value for companies while traditional accounting techniques have neglected value-generating intangible assets. Moreover, as many accounting measures reflect historical performance, the MVA and CFR capture the capital market's estimation of expected income, NPV, while equity and debt are included in the observation.

4.3 Estimation

The evidence on post-divestiture financial performance is relatively scarce as most divestiture research focuses on short-term price performance using the event study methodology (e.g. Jain 1985; Hite et al. 1987; John et al. 1992). Additionally, studies focusing on share prices have mainly analyzed underperforming companies to determine equity value increases in asset sell-offs. The set-up between underperforming and well-performing companies differs considerably as the value creation mechanisms are entirely different.

While the event study methodology would ideally enable the evaluation of changes in short-term shareholder value, the multidimensionality of the constructs of financial performance and shareholder value makes using this methodology challenging. Additionally, since the objective of this study is to measure the long-term performance effects of well-performing companies and analyze the relationship between financial performance and shareholder value, using the event study research method is not considered a suitable option for this study. Moreover, although some of the sources of misspecifications in the event study methodology have been corrected, tests for long-term abnormal returns remain unreliable (Barber & Lyon 1997; Lyon et al. 1999).

In this study, cross-sectional regression is employed to estimate the impacts of asset sell-off on cash flow performance, profitability, and shareholder value. The cross-sectional model is particularly chosen as it enables the investigation of long-term economic benefits generated by assets. Therefore, analyzing the relationship between the economic benefits generated by assets and shareholder value is possible, and improved performance and market inefficiency explanations for increased shareholder value can be distinguished. In event studies, performance and market inefficiency explanations cannot be distinguished as the methodology cannot evidence the sources of asset sell-off-related performance gains.

As the employed model is cross-sectional regression, all company-specific data points for the pre- and post- asset sell-off periods $t \in [-1, -2, -3, -4]$ and $t \in [1,\ 2,\ 3,\ 4]$ are drawn on a single time point by calculating the medians of the pre- and post-period EBITDA margins, *CFRs*, and *MVA* metric. Consequently, the data comprise observations of individual sample companies at the same time point.

Particularly, the *CFR* variable is prone to differences in period-by-period performance as it is affected by company- and sector-specific and economy-wide factors. The sector-adjusted median performance is used as a benchmark for a performance comparison to mitigate the impacts of these factors. Annual sector-adjusted performance measures are calculated for each sample company and pre- and post-asset sell-off years. The annual sector-adjusted performance is calculated by subtracting the technology sector's median CFR from the sample company's CFR. The data for sample companies are not included in the median sector calculations.

Additionally, when calculating CFRs, the change in equity values at the asset sell-off announcement is excluded from the market value of assets as the improvements imply

$$\Delta V_o = \frac{\Delta v}{\delta},$$

where ΔV_o is the change in the market value of assets, Δv is the vector of cash flow changes, and $1/\delta$ is the discount factor. Under the assumptions of market efficiency, the share price reaction to the announcement represents the value of expected post-asset sell-off performance improvements. Specifically, if the share price reaction is included in the market value of assets reflecting the future performance, the *CFRs* in the post-asset sell-off period show statistically significant increases compared to the technology sector benchmark only in the second post-asset sell-off year.[1] The change in equity value is measured from 5 days before the announcement until the date assets are sold.

The total estimation period is 8 years, comprising 4-year pre- and post-divestiture periods, as this is sufficiently long to examine the post-asset sell-off impacts and sufficiently short to mitigate the impacts of other strategic decisions on financial performance and shareholder value. If a divesting company is delisted during the post-asset sell-off period or the post-asset sell-off period is shorter than 4 years, the return calculation stops on the date of delisting or at the end of the available post-asset sell-off period.

The following model estimates the changes in post-asset sell-off CFRs to examine whether a positive relationship exists between cash flow performance and asset sell-offs:

$$PostCFR_i = \alpha + \beta_1 PreCFR_i + \beta_2 ASIZE_i + \beta_3 EE_i + \beta_4 NE_i + \beta_5 SE_i + \varepsilon_i,$$

where i is the subscript for each company, $PostCFR_i$ is the mean annual post-asset sell-off *CFR* for company *i,* $PreCFR_i$ is the mean annual pre-asset sell-off *CFR* for company *i,* and ASIZE is the relative size of the asset sell-off. EE, NE, and SE are dummy variables taking the value 1 if company *i* is headquartered in Eastern, Northern, or Southern Europe and 0 otherwise, and ε is the error term. ASIZE is the relative proportion of the asset sell-off's completed value with respect to the company's market capitalization before asset sell-off. The companies headquartered in Western Europe constitute the reference

[1] More information about median annual cash flow returns without the exclusion of asset sell-off announcement revaluation is provided in Appendix 1.

category as their indicator variable is always zero; therefore, the variable was omitted from the model.

Additionally, the model to investigate the sector-adjusted CFRs is formulated as follows:

$$PostCFR_i^{adj.} = \alpha + \beta_1 PreCFR_i^{adj.} + \beta_2 EE_i + \beta_3 NE_i + \beta_4 SE_i + \varepsilon_i,$$

where α is the abnormal post-asset sell-off CFR as it is independent of pre-asset sell-off returns and captures abnormal sector-adjusted *CFRs* following the asset sell-off, and post and pre-CFRs are the mean annual values as in the previous model.

As the EBITDA margin is another proxy for financial performance, it is estimated as follows:

$$PostEBITDA(\%)_i = \alpha + \beta_1 PreEBITDA(\%)_i + \beta_2 ASIZE_i + \beta_3 EE_i + \beta_4 NE_i + \beta_5 SE_i + \varepsilon_i,$$

where $PostEBITDA(\%)_i$ is the mean annual post-asset sell-off EBITDA margin for company I and $PreEBITDA(\%)_i$ is the mean annual pre-asset sell-off EBITDA margin for company i. The proxy for the shareholder value is MVA, and the estimation is obtained using the following equation to examine whether a positive relationship exists between shareholder value and asset sell-offs:

$$PostMVA_i = \alpha + \beta_1 PreMVA_i + \beta_2 ASIZE_i + \beta_3 EE_i + \beta_4 NE_i + \beta_5 SE_i + \varepsilon_{i,}$$

where $PostMVA_i$ is the mean annual change in MVA in the post-asset sell-off period and $PreMVA_i$ is the mean annual change in the MVA pre-asset sell-off period.

In addition, the impacts of asset sell-offs on market expectations are investigated by analysing changes in EV/EBITDA, EV/Sales and P/E valuation ratios introduced in Section 2.4. It is not assumed that the share prices prior and at the time of asset sell-offs are necessarily the best estimates of company's intrinsic value. Thereby, valuation ratios are assumed to be normative benchmarks to the market's expectations and criterion for altering forecasts. Under this assumption valuation ratios are considered to be noisy proxies for intrinsic value and therefore it is impossible to derive a conclusion if valuation ratios are depressed by the market's low expectations or inflated by overoptimistic forecasts in pre- and post-asset sell-periods.

5 RESULTS

5.1 Sample description

Table 6 reports descriptive statistics of the dependent and independent variables employed in the cross-sectional estimation procedure. The summary statistics are calculated for the pre- and post-asset sell-off periods. The number of observations for each variable varies as the data are unbalanced. Extreme values in results are winsorized to reduce the influence of outliers, that is, values are limited, at the 1 % and 99 % levels, using the full sample to define pre- and post-period extremes. All the variables presented in Table 6 have been winsorized.

Table 6: Summary statistics for the variables

Table 6 reports the number of observations and mean, average, and standard deviations of the dependent and independent variables employed in the analysis. Furthermore, the skewness and maximum and minimum values of variables and ratios are reported. MVA is presented in millions of euros. All the variables presented in the table have been winsorized at the 1% and 99% levels to address their extreme outliers.

Variable	N	Median	Avg.	St. dev.	Skewness	Max	Min
Pre-CFR ^{raw}	561	0.103	0.101	0.148	0.495	0.754	−0.334
Post-CFR $^{raw.}$	510	0.111	0.127	0.239	3.870	1.794	−0.465
Pre-CFR $^{adj.}$	561	−0.003	−0.004	0.147	−0.377	0.647	−0.447
Post-CFR $^{adj.}$	510	0.020	0.034	0.240	3.833	1.715	−0.589
Pre-EBITDA (%)	577	0.134	0.126	0.187	−0.897	0.664	−0.563
Post-EBITDA (%)	504	0.157	0.142	0.197	−1.651	0.569	−0.703
Pre-MVA	570	82.032	1,501	4,959	3.388	30,064	−9,827
Post-MVA	510	72.271	2,026	6,539	4.277	45,980	−10,194
ASIZE (%)	87	0.083	0.410	1.383	1.383	11.848	0.000

The figures in Table 6 demonstrate that the sample's pre-asset sell-off CFR performance compared to the whole technology sector is negative, whereas the sample's post-asset sell-off CFRs exceed the sector benchmark. Additionally, the median Post-EBITDA margin has increased from 13.4 % to 15.7 % and the average Post-EBITDA margin from 12.6 % to 14.2 % compared to the Pre-EBITDA margin. The median Post-MVA has decreased by 11.9 %, whereas the average MVA has increased by 35.0 % compared to the Pre-MVA. The median asset sell-off size is 8.3 % and the average sell-off size is 41 % of the sample companies' market value of equity.

The results reported in Table 6 also indicate that the success of completed asset sell-offs varies as the standard deviation of all variables increases in the post-asset sell-off period. For instance, the approximately symmetrical distribution of the CFR becomes highly skewed in the post-asset sell-off period, which appears as an increasing average value and a larger difference between the average and median measures. Without winsorization, the skewness of the raw Post-CFR would have been as high as 8.489, and even the winsorized value remained as high as 3.870. Therefore, the post-asset sell-off *CFRs* were also calculated using log base e transformation to reduce the right-side skewness.

Furthermore, log base e transformation is also used to reduce the right-side skewness of the ASIZE distribution. The sum of the minimum value and a constant fixed arbitrary value were added to all values to address negative values before logarithmic transformation of the *CFR*. Table 7 presents the logarithmically transformed variables.

Table 7: Summary statistics for the transformed variables

Table 7 reports the number of observations and mean, average, and standard deviations of the logarithmically transformed variables. Furthermore, the skewness and maximum and minimum values of variables and ratios are reported. Pre- and Post-CFR ^{log_e} are the natural logarithms of pre- and post-asset sell-off *CFRs*. ASIZE ^{log_e} is the natural logarithm of the relative proportion of the asset sell-off's completed value with respect to the company's market capitalization before the asset sell-off. All the variables in the table have been winsorized at the 1 % and 99 % levels to address their extreme outliers.

Variable	N	Median	Avg.	St. dev.	Skewness	Max	Min
Pre-CFR ^{log_e}	561	0.450	0.444	0.095	−0.368	0.797	0.124
Post-CFR ^{log_e}	510	0.455	0.456	0.130	1.319	1.181	0.000
Pre-CFR $^{adj.\ log_e}$	561	0.462	0.456	0.094	−0.502	0.805	0.133
Post-CFR $^{adj.\ log_e}$	510	0.476	0.476	0.128	1.206	1.195	0.000
ASIZE ^{log_e}	87	−2.487	−2.669	1.981	−0.353	2.472	−7.900

Table 8 reports the CFR, MVA, and EBITDA margin levels at different points of the pre- and post-asset sell-off period. The sector-adjusted median CFR and the relative proportion of positive sector-adjusted CFRs in the sample have increased steadily in each of the post-asset sell-off years until year 4. This indicates that the outperformance compared with the technology sector benchmark is consistent in the 4-year post-asset sell-off period but not constantly buoyant as the values experience a slight decrease in the last post-asset sell-off year.

Table 8: Pre- and post CFR, MVA, and EBITDA margin

Table 8 reports the median of the CFR, MVA, and EBITDA margin during pre- and post-asset sell-off periods. Furthermore, the sector-adjusted median of the CFR and the relative proportion of positive sector-adjusted CFRs in the sample are reported. The symbol ** denotes statistical significance $p < 0.05$ using a two-tailed test.

	CFR			MVA	EBITDA (%)
Year relative to asset sell-off	Median	Sector-adjusted		Median	Median
		Median	Positive		
Year −4	0.113	0.007	53.4 %	84.837	0.150
Year −3	0.097	−0.009	43.2 %	92.462	0.127
Year −2	0.098	−0.004	48.6 %	71.348	0.127
Year −1	0.104	−0.002	49.7 %	54.628	0.135
Year 1	0.108	0.013	60.3 %	73.272	0.155
Year 2	0.120	0.029 **	62.7 %	45.119	0.157
Year 3	0.113	0.032 **	64.8 %	70.110	0.168
Year 4	0.098	0.015	57.4 %	79.679	0.156

As interpreted from Table 8, the sector-adjusted CFR is positive from the first post-asset sell-off year to the last, whereas the sector-adjusted pre-asset sell-off CFR is only positive in year −4. Sector-adjusted median CFRs in years −4 to −1 range from −0.9 % to 0.7 %, whereas in years 1 to 4, they range from 1.3 % to 3.2 %. Regarding *CFRs*, the EBITDA margin also increased steadily except in post-asset sell-off year 4.

Based on the results reported in Table 8, asset sell-offs appear to increase the financial performance of technology companies as sector-adjusted CFRs in post-asset sell-off years are statistically significant at the 95 % confidence level. Regarding shareholder value, no clear pattern is observed as the value of MVA varies up and down from year to year. Furthermore, the median proportion of positive sector-adjusted *CFRs* in the sample is 49.1 % in the pre-asset sell-off period and 61.5 % in the post-asset sell-off period.

Table 9 reports descriptive statistics of the ratios employed in additional analysis. ICRs and EV/EBITDA ratios have been winsorized at the 1 % and 99 % levels to address their extreme outliers.

Table 9: Summary statistics for the additional ratios

Table 9 reports the number of observations and mean, average and standard deviations of the ratios and measures employed in additional analysis. Furthermore, the skewness and maximum and minimum values of ratios are reported. V_e is presented in millions of euros. All ICRs and EV/EBITDA ratios are winsorized at the 1 % and 99 % levels to address their extreme outliers. Finally, negative NIE excl. denotes the exclusion of companies that can cover interest expenses with their interest income, that is, their net interest expense is negative.

Variable	N	Median	Avg.	St. dev.	Skewness	Max	Min
Pre-ICR	545	9.117	19.501	155.660	0.230	698	−704
Post-ICR	479	13.939	20.600	166.589	−1.855	993	−645
Pre-ICR neg. NIE excl.	408	16.821	58.417	123.515	3.654	709	0.505
Post-ICR neg. NIE excl.	367	20.686	63.215	160.984	5.594	1,211	0.686
Pre-V_e	572	473.947	4,142	9,098	4.822	105,624	0.668
Post-V_e	513	543.779	4,973	10,918	4.636	99,248	0.000
Pre-EV/EBITDA	578	8.373	6.500	31.799	−3.575	120	−210
Post-EV/EBITDA	519	9.250	11.034	27.141	2.028	181	−95
Pre-EV/SALES	575	1.417	2.381	5.517	10.696	83.210	−0.690
Post-EV/SALES	514	1.758	2.571	3.234	6.325	38.581	0.030
Pre-P/E	577	12.027	9.050	85.331	4.556	1,383	−949
Post-P/E	515	15.589	18.696	65.783	2.166	699	−358

In Table 9, *ICR*s have also been calculated exclusively for companies that cannot cover their interest expenses with their interest incomes, that is, their net interest expense is positive. The results in Table 8 show that both the median and average Post-ICRs for the entire sample and companies with a positive net interest expense have improved compared to the Pre-ICR. This further supports the improved profitability results reported in Tables 6 and 8 as the sample companies can better cover their interest expenses in the post-asset sell-off period. It should be emphasized that the asset sell-offs aiming to use proceeds to pay down existing outstanding debt are not included in the data as these are now considered strategic transactions.

The results for valuation multiples in Table 9 indicate that the market's expectations towards the companies improve in the post-asset sell-off period as all employed valuation multiples increase as measured by the median. Particularly, the P/E ratio experiences a steep increase in the median from 12.027 to 15.589 and from an average of 9.050 to 18.696, indicating the expectations for growing earnings for the following years as the market is willing to pay more for the current earnings.

Table 10 reports pre- and post-asset sell-off compounded annual growth rates (*CAGRs*) for the substantive components of the variables calculated from pre-asset sell-off year −4 to year 0 and pre-asset sell-off year −1 to the final post-asset sell-off year. As 2016 is the last year with a full 4-year post-asset sell-off period, the completed asset sell-offs between 2009 and 2016 alone are included in the observation.

Table 10: Compounded annual growth rates by subsector

Table 10 reports compounded annual growth rates for the sample's aggregated EBITDA, enterprise value, equity value, book value of capital employed, and sales for pre- and post-asset sell-off periods for asset sell-offs completed between 2009 and 2016.

Sector	Computers	Internet	Semiconductors	Software	Telecom	Sample
Pre-EBITDA	−0.010	0.387	0.078	0.053	−0.075	−0.031
Post-EBITDA	0.059	−0.204	0.272	0.049	−0.047	0.029
Pre-EV	0.107	0.181	0.132	0.091	−0.096	0.001
Post-EV	0.037	−0.022	0.241	0.166	−0.028	0.082
Pre-V_e	0.118	0.078	0.133	0.071	−0.128	−0.005
Post-V_e	0.028	−0.040	0.232	0.159	−0.024	0.097
Pre-CE	0.074	0.047	−0.011	0.110	−0.021	0.004
Post-CE	0.032	0.009	0.183	0.120	−0.036	0.033
Pre-Sales	0.061	0.186	−0.032	0.040	−0.054	−0.026
Post-Sales	0.018	0.021	0.091	0.051	−0.058	−0.002

The subsectors computers, semiconductors, and telecommunication increased their profitability during the post-asset sell-off period as their EBITDA increased faster or decreased slower than sales. Simultaneously, telecommunication was the only subsector that experienced decreases in both EBITDA and sales during the pre- and post-asset sell-off periods. The decreases during the post-asset sell-off period were large, measured by absolute numbers, as telecommunication represented 61.0 % and 57.9 % of the aggregated EBITDA and sales of all subsectors at pre-asset sell-off year −1 and only 41.6 % and 42.4 % at post-asset sell-off year 4, respectively. Overall, the aggregated EBITDA of the whole sample increased more than sales. These can be interpreted from the measures in Table 10.

Figure 7 illustrates the geographical distribution of completed asset sell-offs between the technology subsectors to perceive the geographical significance of subsectors.

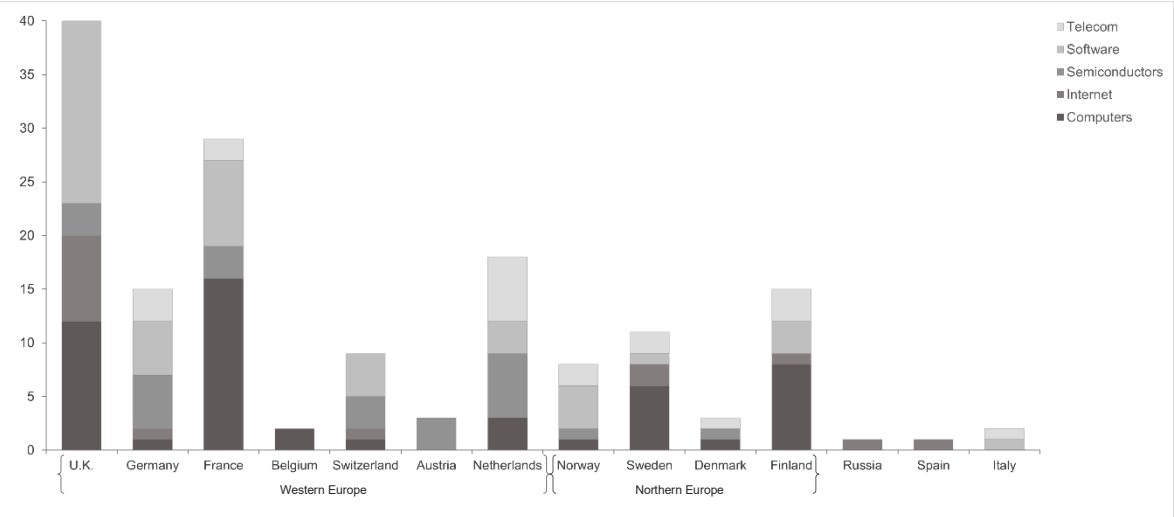

Figure 7: Completed asset sell-offs between countries and subsectors

Figure 7 displays the geographical distribution of completed asset sell-offs between the subsectors. The number of observations is limited to 40; thereby, 10 U.K. asset sell-offs in the software subsector were omitted from the figure.

As Figure 7 demonstrates, the largest subsectors in Western Europe were software with 37.30 % and computers with 27.78 %. In Northern Europe, the corresponding figures were 21.62 % and 43.24 %, respectively. Overall, the worst-performing subsector, telecommunication, accounted for 8.73 % of completed asset sell-offs in Western Europe and 21.62 % in Northern Europe. Furthermore, semiconductors accounted for 18.25 % of all asset sell-offs in Western Europe and 5.41 % in Northern Europe.

As with Table 10, the higher growth rates for the V_e and EV compared to earnings measures are also interpreted from Table 11. In Table 10, the increased CAGR of V_e further supports the results related to valuation multiples also reported in Table 9 as the elevated V_e value indicates that the market's expectations towards the sample companies increased during the post-asset sell-off period. As reported in Table 10, the CAGR of V_e in the pre-asset sell-off period was −0.005 and 0.097 in the post-asset sell-off period, a significant change as the shareholders experienced a nearly annually compounding growth rate of 10% for their equity holdings following the asset sell-off. Furthermore, EBITDA increased slower than the EV in the post-asset sell-off period, depressing the CFR values. This is interpreted from Table 11 as the median EV/EBITDA ratio increased in post-asset sell-off years 1 to 4 from 8.833 to 10.635. Additionally, the median P/E ratio increased from 14.779 to 17.877.

Table 11: Pre- and post ICR, EV/EBITDA, EV/SALES, and P/E

Table 11 reports medians of the ICR, EV/EBITDA, EV/SALES, and P/E ratios during the pre- and post-asset sell-off periods. The ICR includes only companies that cannot cover interest expenses with their interest income, that is, their net interest expense is positive.

	ICR $^{pos.NIE}$	EV/EBITDA	EV/SALES	P/E
Year relative to asset sell-off	Median	Median	Median	Median
Year −4	17.180	8.483	1.428	12.693
Year −3	14.332	8.338	1.333	11.550
Year −2	17.372	8.066	1.407	10.166
Year −1	16.799	8.453	1.439	12.989
Year 1	18.772	8.833	1.609	14.779
Year 2	23.045	9.208	1.662	15.388
Year 3	26.531	9.092	1.774	15.560
Year 4	16.436	10.635	2.069	17.877

Furthermore, Table 11 reports that after the completed asset sell-offs, the median interest coverage rates were higher with a median annual value of 20.909 compared to the median post-asset sell-off *ICR* of 16.990. This finding indicates improved financial performance as companies were better able to meet their obligations in terms of operational profitability. Also considering companies with negative net interest expenses, the sample companies' *ICRs* appeared to converge during the post-asset sell-off period as skewness and standard deviation decreased significantly, and the median *ICR* simultaneously increased by 52.9 %.

5.2 EBITDA margin

The first research objective of this study is to analyze and investigate profitability in pre- and post-asset sell-off periods to determine the extent to which strategic asset sell-offs impact a divesting technology company's profitability. The analysis first examines whether the relationship between the change in post-asset sell-off profitability is correlated with pre-asset sell-off profitability to fulfil the objective. Additionally, the relationship between the relative size of asset sell-off and post-asset sell-off EBITDA margin is examined.

The coefficients of the regression analysis for the EBITDA margin are reported in Table 12, and their statistical significance is marked with ***, denoting a 99% confidence level. Additionally, R^2s, adjusted R^2s, F-values, and p-values of F-statistics with a null hypothesis, that none of the coefficients differs from zero, are reported.

Table 12: Regression results for EBITDA margin

Table 12 reports the cross-sectional regression results and coefficients with their statistical significance for the EBITDA margin. Standard errors are shown in parentheses. Column A reports the raw EBITDA margins, Column B the winsorized EBITDA margins, and Columns C and D the raw EBITDA margins when the relative size of the asset sell-off with respect to the company's market capitalization is considered. N denotes the number of observations used in calculating the company-specific medians in the pre- and post-asset sell-off periods. The symbol *** denotes statistical significance $p < 0.01$.

Variables	A	B	C	D
Pre-EBITDA(%)	0.566	0.441	0.720	0.750
	(0.075) ***	(0.084) ***	(0.113) ***	(0.111) ***
ASIZE	-	-	-	−0.010
				(0.015)
ASIZE ^{log_e}	-	-	−0.014	-
			(0.010)	
Intercept	0.074	0.090	−0.002	0.035
	(0.017) ***	(0.017) ***	(0.03)	(0.025)
R^2	0.282	0.161	0.374	0.364
Adjusted R^2	0.277	0.155	0.358	0.348
F	56.53	27.54	24.74	23.73
p-value	0.00 %	0.00 %	0.00 %	0.00 %
Breusch-Pagan	3.52	0.09	3.86	1.60
N	577/504	577/504	337/286	337/286

As represented in Table 12, the pre-asset sell-off EBITDA margin is statistically significant at the 1 % level and positively correlated regardless of the model used. Conversely, the relative size of the asset sell-off with respect to the company's market capitalization appears negatively correlated and statistically insignificant. Furthermore, the adjusted R^2 ranges from 15.5 % to 27.7 %, depending on whether the raw or winsorized values are used.

Since the deal value is not disclosed for all asset sell-offs examined, the sample size is reduced to 87 asset sell-offs representing 52 % of the sample when the dependent variable is regressed using the model employing a size variable. By adding a size variable to the

model, the adjusted R^2 ranges from 36.4 % to 37.4 %. Consequently, at the lowest, out of all the models, B explains 15.5 % of the variability of the post-asset sell-off EBITDA margin. Conversely, at the highest, the regressors in model C explain 37.4 %. Moreover, the p-values of F-statistics are statistically significant at the 99 % confidence level, indicating the predictive power of the variables.

The results in Table 12 further support the *CAGRs* reported in Table 10 and the increased annual median EBITDA margins reported in Table 8 by indicating that the realignment with a cost reduction strategy, improved management of assets, generates more immediate and tangible results for companies than realignment strategies aiming to facilitate revenue growth. It appears that redeploying resources and capital so that they are reflected in financial figures other than profitability metrics takes more than 4 years in some cases. Furthermore, as reported in Table 6, the median EBITDA margin increases by 2.3 %, and the average EBITDA margin increases by 1.6 % in the post-asset sell-off period. Therefore, the estimation results suggest that the impacts on the profitability of both inferior and excellent companies are positive.

The analysis is then extended to the geographical classes to determine the regional differences in changes in EBITDA margins. The companies headquartered in Western Europe constitute the reference category as their indicator variable is always zero; therefore, the variable was omitted from the model. With dummy coding, the intercept term is equal to the mean of the reference category, that is, the category with all dummy variables equal to zero. Table 13 reports the results.

Table 13: Regression results for EBITDA margin with dummy coding

Table 13 reports the cross-sectional regression results and coefficients with their statistical significance for the EBITDA margin when dummy variables are employed in the model. Standard errors are shown in parentheses. Column A reports the raw EBITDA margins and Column B the winsorized EBITDA margins. EE, NE, and SE denote Eastern, Northern, and Southern Europe, respectively. The companies headquartered in Western Europe constitute the reference category. N denotes the number of observations used in calculating the company-specific medians in the pre- and post-asset sell-off periods. The symbol *** denotes statistical significance $p < 0.01$.

Variables	A	B
Pre-EBITDA (%)	0.561 (0.076) ***	0.440 (0.086) ***
EE	−0.016 (0.167)	0.019 (0.160)
NE	−0.055 (0.034)	−0.049 (0.032)
SE	−0.050 (0.097)	−0.038 (0.093)
Intercept	0.087 (0.018) ***	0.101 (0.019) ***
R^2	0.291	0.175
Adjusted R^2	0.271	0.151
F	14.37	7.46
p-value	0.00 %	0.00 %
Breusch-Pagan	4.08	0.79
N	577/504	577/504

In Table 13, the coefficient of a dummy variable shows the average differences in the dependent variable compared to the reference category. Hence, by comparing the estimated coefficients, inferences can be made about the differences between the impacts of asset sell-off on regional profitability. As represented in Table 13, the indicator coefficients show that the increase in profitability in other European regions is lower than in Western Europe. However, it should be emphasized that the number of completed asset sell-offs in the sample period in Western, Eastern, Northern, and Southern Europe are 126, 1, 38, and 3, respectively. Therefore, the results for Southern and Eastern Europe are insufficiently robust to generalize. Moreover, all the coefficients of dummy variables lack statistical significance at conventional levels.

Overall, Hypothesis 1 stating that strategic asset sell-offs of publicly traded technology companies headquartered in the European Economic Area increase long-term financial performance through improved profitability is consistent with the results. However, no statistically significant evidence exists that the relative size of the asset sell-off impacts

the outcome regarding financial performance. This suggests that the relative size of the asset sell-off does not have a robust relationship with the estimated Post-EBITDA margin. Therefore, Hypothesis 2 positing that the relative size of asset sell-offs impacts the relationship between financial performance and strategic asset sell-offs is not supported.

5.3 Cash flow returns

The next analysis examines whether the relationship between the change in post-asset sell-off cash flow performance is correlated with pre-asset sell-off cash flow performance. Additionally, the relationship between the relative size of asset sell-off and post-asset sell-off *CFRs* is examined. Regarding the results for *CFRs*, the coefficients of the regression analysis for *CFRs* are reported in Table 14. Statistical significance is marked with ***, denoting a 99 % confidence level.

As shown in Table 14, the estimated slope coefficient for the Pre-CFR ranges from 0.278 to 0.769, depending on the model used. Regardless of the model, all coefficients for the Pre-CFR are statistically significant, indicating that *CFRs* tend to persist over time. The estimates of intercepts show that the annual increase in the post-asset sell-off CFR range from 2.6 % to 8.3 %, depending on whether the pre-asset sell-off cash flow performance is controlled for alone or with the relative size of the asset sell-off variable.

However, the coefficients of intercepts are statistically significant only when size is not controlled. Regarding the adjusted R^2, the value ranges from 7.0 % to 16.0 % depending on whether the raw, winsorized, or transformed values are used or whether the relative size of the asset sell-off is considered in the analysis.

Additionally, p-values of F-statistics are statistically significant at the 99 % level, implying evidence of the predictive power of the variables. However, model E violates the homoscedasticity assumption with a Breusch-Pagan statistic of 4.77. Therefore, the null hypothesis positing that residuals are distributed with equal variance and are therefore normally distributed is rejected.

Table 14: Regression results for CFR

Table 14 reports the cross-sectional regression results and coefficients with their statistical significance for CFRs. Standard errors are shown in parentheses. Column A reports the raw *CFRs*, Column B the winsorized *CFRs*, and Columns C and D the raw *CFRs* when the relative size of the asset sell-off with respect to the company's market capitalization is considered. Finally, Column E reports the log base e transformed *CFRs*. N denotes the number of observations used in calculating the company-specific medians in the pre- and post-asset sell-off periods. The symbol *** denotes statistical significance $p < 0.01$.

Variables	A	B	C	D	E
Pre-CFR	0.278 (0.081) ***	0.518 (0.102) ***	0.780 (0.199) ***	0.769 (0.199) ***	-
Pre-CFR $^{\log_e}$	-	-	-	-	0.548 (0.102) ***
ASIZE	-	-	-	−0.002 (0.011)	-
ASIZE $^{\log_e}$	-	-	0.006 (0.008)	-	-
Intercept	0.083 (0.014) ***	0.061 (0.014) ***	0.039 (0.031)	0.026 (0.024)	0.208 (0.046) ***
R^2	0.076	0.151	0.159	0.155	0.166
Adjusted R^2	0.070	0.145	0.139	0.134	0.160
F	11.92	25.66	7.77	7.49	28.67
p-value	0.07 %	0.00 %	0.08 %	0.10 %	0.00 %
Breusch-Pagan	0.75	1.12	3.32	1.63	4.77
N	561/510	561/510	331/283	331/283	561/510

The examination is extended to the cash flow performance compared to the technology sector benchmark to investigate the magnitudes of the results reported in Table 14. Table 15 reports the coefficients of the regression analysis for sector-adjusted *CFRs*. Statistical significance is marked with *** and **, denoting 99 % and 95 % confidence levels, respectively.

Table 15: Regression results for sector-adjusted CFR

Table 15 reports the cross-sectional regression results and coefficients with their statistical significance for sector-adjusted CFRs. Standard errors are shown in parentheses. Column A reports the raw *CFRs*, Column B the winsorized, and Column C logarithmically transformed *CFRs*. N denotes the number of observations used in calculating the company-specific medians in the pre- and post-asset sell-off periods. The symbols *** and ** denote statistical significance $p < 0.01$ and $p < 0.05$, respectively.

Variables	A	B	C
Pre-CFR $^{adj.}$	0.278 (0.079) ***	0.510 (0.101) ***	-
Pre-CFR $^{adj.\ log_e}$			0.526 (0.100) ***
Intercept	0.023 (0.010) **	0.026 (0.010) **	0.233 (0.047) ***
R^2	0.079	0.150	0.159
Adjusted R^2	0.073	0.144	0.153
F	12.38	25.43	27.29
p-value	0.05 %	0.00 %	0.00 %
Breusch-Pagan	0.44	1.58	5.65
N	561/510	561/510	561/510

As demonstrated by the figures in Table 15, at the 99 % confidence level, the statistically significant slope coefficient ranges from 0.278 to 0.510 for raw and winsorized Pre-CFRs. The estimate of the constant term shows a positive and statistically significant increase in sector-adjusted CFRs in the post-asset sell-off period after controlling for pre-asset sell-off CFRs. Therefore, the constant term indicates that sector-adjusted *CFRs* experience an annual increase of 2.3 % or 2.6 % depending on whether the raw or winsorized CFRs are used. The statistical significance of the intercept increases from the 95 % to the 99 % confidence level when model C employing logarithmically transformed variables is used. However, as well as with unadjusted *CFRs*, the model employing logarithmically transformed variables violates the homoskedasticity assumption.

Furthermore, the adjusted R^2 is 7.3 % without winsorizing, 14.4 % with the winsorized data, and 15.3 % with winsorization and transformation. As with the previous models, the p-values of F-statistics are statistically significant at the 99 % confidence level. Based on the results in Table 15, arguably statistically significant abnormal improvement occurs in the operational cash flow performance of divesting technology companies following asset sell-offs. However, the adjusted R^2 reveals that the model used leaves most of the changes

unexplained as the adjusted R^2 is highest at 15.3 % when logarithmically transformed variables are employed.

Similar to the results reported in Table 15, statistically significant abnormal *CFRs* in the post-asset sell-off period are reported in Table 8. The results in both tables provide strong statistical support for the argument that strategic realignment leads to a level of financial performance that exceeds the sector benchmark. Furthermore, as measured by the annual median, 49.1 % of the sample companies have positive abnormal *CFRs* in the pre-asset sell-off period. The proportion increases to 61.5 % in the post-asset sell-off period, indicating that companies with different baseline performance levels experience improvements in their financial performance.

The improvements in abnormal sector-adjusted performance are further supported by the finding that the median annual sector-adjusted *CFRs* increase from the pre-asset sell-off period value of −0.3 % to 2.2 % in the post-asset sell-off period. In conclusion, for this sample, no evidence exists of statistically significant abnormal sector-adjusted cash flow performance in the pre-asset sell-off period as none of the annual median returns are significantly different from zero. Conversely, in the post-asset sell-off period, the statistical significance is supported by evidence.

Finally, the analysis is extended to the geographical classes to determine the regional distribution of *CFRs*. As the coefficient of a dummy variable shows the average differences in the dependent variable compared to the reference category, it is interpreted from Table 16 that asset sell-offs completed in Southern Europe appear to increase *CFRs* the most, whereas the increase is the lowest in Northern Europe. Overall, the coefficients of dummy variables lack statistical significance at conventional levels. The coefficient for Northern Europe in models B and C is the only one with statistical significance at a confidence level of at least 90 %. The companies headquartered in Western Europe constitute the reference category, and the results are reported in Table 16.

Table 16: Regression results for CFR with dummy coding

Table 16 reports the cross-sectional regression results and coefficients with their statistical significance for CFRs when dummy variables are included in the model. Standard errors are shown in parentheses. Column A reports the raw *CFRs*, Column B the winsorized *CFRs*, and Column C the log base e transformed *CFRs*. EE, NE, and SE denote Eastern, Northern, and Southern Europe, respectively. The companies headquartered in Western Europe constitute the reference category. N denotes the number of observations used in calculating the company-specific medians in the pre- and post-asset sell-off periods. The symbols *** and * denote statistical significance $p < 0.01$ and $p < 0.10$, respectively.

Variables	A	B	C
Pre-CFR (%)	0.258 (0.080) ***	0.491 (0.102) ***	0.519 (0.102) ***
EE	−0.064 (0.128)	−0.057 (0.123)	−0.034 (0.078)
NE	−0.043 (0.026)	−0.042 (0.025) *	−0.028 (0.016) *
SE	0.002 (0.075)	−0.001 (0.072)	0.001 (0.045)
Intercept	0.097 (0.015) ***	0.074 (0.016) ***	0.228 (0.046) ***
R^2	0.091	0.163	0.179
Adjusted R^2	0.065	0.139	0.156
F	3.52	6.80	7.62
p-value	0.90 %	0.00 %	0.00 %
Breusch-Pagan	1.33	1.32	4.77
N	561/510	561/510	561/510

In Table 17, the order of magnitude for the distribution of sector-adjusted abnormal *CFRs* between European regions appears similar to that for the regional coefficients reported in Table 16. The positive impact on the sector-adjusted CFR has been greater in Southern Europe than in Western Europe, whereas the companies in Eastern and Northern Europe have experienced a lower increase in their sector-adjusted CFRs compared to Western Europe. Consequently, as the intercept term is equal to the mean of the reference category's sector-adjusted *CFR*, this indicates that the sector-adjusted *CFRs* in Western Europe experience an annual increase of 9.7 % or 7.4 % depending on whether the raw or winsorized *CFRs* are used. As the intercept term for other European regions is calculated by adding the coefficient of dummy variables to the intercept term, it is interpreted from Table 17 that the intercept terms for Eastern and Northern Europe are negative.

Table 17: Regression results for sector-adjusted CFR with dummy coding

Table 17 reports the cross-sectional regression results and coefficients with their statistical significance for sector-adjusted CFRs when dummy variables are included in the model. Standard errors are shown in parentheses. Column A reports the raw *CFRs*, Column B the winsorized *CFRs*, and Column C the log base e transformed *CFRs*. EE, NE, and SE denote Eastern, Northern, and Southern Europe, respectively. The companies headquartered in Western Europe constitute the reference category. N denotes the number of observations used in calculating the company-specific medians in the pre- and post-asset sell-off periods. The symbol *** denotes statistical significance $p < 0.01$.

Variables	A	B	C
Pre-CFR (%)	0.255 (0.079) ***	0.478 (0.101) ***	0.494 (0.100) ***
EE	−0.062 (0.125)	−0.054 (0.120)	−0.031 (0.075)
NE	−0.042 (0.025) *	−0.041 (0.023) *	−0.027 (0.015) *
SE	0.005 (0.073)	0.001 (0.070)	0.002 (0.044)
Intercept	0.034 (0.012) ***	0.036 (0.011) ***	0.255 (0.047) ***
R^2	0.093	0.159	0.170
Adjusted R^2	0.067	0.135	0.146
F	3.60	6.63	7.17
p-value	0.80 %	0.00 %	0.00 %
Breusch-Pagan	1.08	1.64	5.62
N	561/510	561/510	561/510

The results support Hypothesis 1, contending that strategic asset sell-offs of publicly traded technology companies headquartered in the European Economic Area increase long-term financial performance through improved cash flow performance. As with the examination of the EBITDA margin, Hypothesis 2, which posits that the relative size of asset sell-offs impacts the relationship between financial performance and strategic asset sell-offs, is not supported.

5.4 Market value added

The last objective is to analyze and investigate shareholder value. Table 18 reports the three models used to estimate *MVA*. The coefficient for the Pre-MVA variable is significant at the 99 % confidence level in all three models, with values ranging from 0.458 to 0.994. As with other estimation models, the coefficient for ASIZE remains statistically insignificant.

Table 18: Regression results for MVA

Table 18 reports the cross-sectional regression results and coefficients with their statistical significance for the *MVA* metric. Standard errors are shown in parentheses. Column A reports the raw *MVA* and Column B the winsorized *MVA*. Columns C and D report the results when the relative size of the asset sell-off with respect to the company's market capitalization is considered. N denotes the number of observations used in calculating the company-specific medians in the pre- and post-asset sell-off periods. The symbol *** denotes statistical significance $p < 0.01$.

Variables	A	B	C	D
Pre-MVA	0.994	0.990	0.458	0.479
	(0.075) ***	(0.067) ***	(0.099) ***	(0.097) ***
ASIZE	-	-	-	−148.864
				(326.873)
ASIZE ^{log_e}	-	-	−252.706	-
			(233.669)	
Intercept	553.266	481.039	132.743	846.241
	(406.576)	(341.241)	(761.639)	(495.515)
R^2	0.545	0.599	0.244	0.235
Adjusted R^2	0.541	0.596	0.225	0.216
F	174.6	215.2	13.20	12.57
p-value	0.00 %	0.00 %	0.00 %	0.00 %
Breusch-Pagan	71.90	55.60	38.47	38.14
N	570/510	570/510	338/287	338/287

As shown in Table 18, model B has the highest explanatory power as the adjusted R^2 is 59.6 %. Furthermore, all the regression equations in Table 18 employing Post-MVA as a dependent variable yielded a significant model. However, as an exception to the previously used models, all the models yielded only one variable of significance. The estimate of intercept shows no significance regardless of the model used. Additionally, when the relative size of asset sell-offs is controlled for, the coefficient for Pre-MVA is more than halved. Overall, the results reported in Table 18 should be interpreted extremely cautiously as the MVA measure has the largest skewness of all the used variables.

The dummy variables for European regions are employed in regression models A and B reported in Table 15 to further analyze the regional differences in the MVA measure. Similar to other regressions, the companies headquartered in Western Europe constitute

the reference category. Consequently, the coefficient for dummy variables represents an estimate of an average difference in MVA with respect to Western Europe. Thus, as interpreted from Table 19, the only region with a positive *MVA* metric is the reference category as the negative values of other coefficients exceed the positive value of the intercept term for Western Europe. The output of a regression of the Post-MVA on dummy variables for each of the four regions of Europe is presented in Table 19.

Table 19: Regression results for MVA with dummy coding

Table 19 reports the cross-sectional regression results and coefficients with their statistical significance for the *MVA* metric when dummy variables are employed in the model. Standard errors are shown in parentheses. Column A reports the raw *MVA* and Column B the winsorized *MVA*. EE, NE, and SE denote Eastern, Northern, and Southern Europe, respectively. The companies headquartered in Western Europe constitute the reference category. N denotes the number of observations used in calculating the company-specific medians in the pre- and post-asset sell-off periods. The symbols ***, **, and * denote statistical significances $p < 0.01$, $p < 0.05$, and $p < 0.10$, respectively.

Variables	A	B
Pre-MVA	0.992 (0.075) ***	0.998 (0.068) ***
EE	−566.311 (4721.956)	−811.760 (3972.469)
NE	−1,821.825 (967.526) *	−1,136.562 (817.301)
SE	−5,067.952 (2,752.798) *	−3,983.121 (2,313.826) *
Intercept	1,001.283 (456.516) **	798.948 (386.578) **
R^2	0.566	0.612
Adjusted R^2	0.554	0.600
F	45.93	54.7
p-value	0.00 %	0.00 %
Breusch-Pagan	73.44	55.56
N	570/510	570/510

Hypothesis 3 contends that strategic asset sell-offs of publicly traded technology companies headquartered in the European Economic Area create value for shareholders through the improved *MVA* metric. Since the Pre-MVA variable has a positive sign in Table 18, it is assumed to be an indicator of additional value creation. Although Hypothesis 3 is supported, as interpreted from Table 8, the median of the annual MVA decreased from 78.09 million euros to 71.69 in the post-asset sell-off period compared to

the pre-asset sell-off period. Additionally, the median annual positive MVA values decreased from 99 to 89 in the period following asset sell-offs.

Simultaneously, Table 6 shows that the average Post-MVA increased by 32.05 % compared to Pre-MVA, whereas the median MVA decreased by 10.02 %. Therefore, it should be assumed that the regression model for the *MVA* metric is violated by skewness to some extent. Furthermore, all the models in Tables 18 and 19 violate the homoscedasticity assumption with Breusch-Pagan statistics ranging from 38.14 to 73.44. Therefore, the null hypothesis stating that residuals are normally distributed is rejected for all the models, indicating that the results are not robust. Moreover, Hypothesis 4 states that the relative size of asset sell-offs impacts the relationship between shareholder value and strategic asset sell-offs. As with all the other regression models used in this study, Hypothesis 4 is inconsistent with the results.

5.5 Summarization

Based on the analysis of the completed asset sell-offs during the period from 1st January 2009 to 31st December 2019, the main findings are as follows. First, consistent with the hypotheses related to financial performance, the findings indicate that divesting technology companies have statistically significant improvements in profitability measured by the EBITDA margin after asset sell-off. Second, this study finds evidence of a positive relationship between asset sell-off and post-asset sell-off performance measured by *CFRs*. Third, the results reported indicate that divesting technology companies have increased post-asset sell-off operating *CFRs* compared with the technology sector benchmark. Fourth, it appears that the model analyzing the *MVA* metric does not yield completely robust results as they contradict the conclusions of the descriptive analysis. Finally, the relative size of the asset sell-off has statistically insignificant impacts on financial performance and shareholder value.

Regarding all the estimated impacts of explanatory variables on dependent variables employed, regional differences exist in the magnitudes of impacts. For instance, not all regions experience a sufficient increase in their cash flow performance to exceed the technology sector benchmark. However, most of the coefficients of dummy variables representing European regions lacked statistical significance at conventional levels, and the number of completed asset sell-offs in Southern and Eastern Europe is insufficient for a robust analysis. Overall, the results imply that Western European asset sell-offs

generated the most considerable impacts on technology companies compared to the results for Northern Europe, which were significant at the 90 % confidence level in the regression models for *CFRs* and *MVA*. However, it should be emphasized that 75 % of all the asset sell-offs in the sample were completed in Western Europe.

Table 20 summarizes the results for the rejected and accepted hypotheses.

Table 20: Hypothesis summary

Table 20 reports whether the hypotheses are rejected according to the results.

	Hypothesis	Result
H_1	Strategic asset sell-offs improve long-term financial performance through improved cash flow performance or profitability.	Not rejected
H_2	The relative size of asset sell-offs impacts the relationship between financial performance and strategic asset sell-offs.	Rejected
H_3	Strategic asset sell-offs improve shareholder value through an improved *MVA* metric.	Rejected
H_4	The relative size of asset sell-offs impacts the relationship between shareholder value and strategic asset sell-offs.	Rejected

The results concerning Hypothesis 3 and shareholder value are contradictory as the descriptive analysis indicates a reduction in MVA, whereas the cross-sectional regression estimation process yielded statistically significant and positive results. However, as mentioned, none of the models employing the post-*MVA* metric as a dependent variable passes the robustness test. Thus, the results appear unreliable. Therefore, further research on the interdependence between shareholder value and asset sell-offs is needed, and Hypothesis 3 is rejected.

6 CONCLUSIONS

The purposes of this study were to revisit and contribute to existing finance research on corporate divestitures, focusing extensively on the buyer's perspective by providing novel evidence from the seller's perspective, and strategic management research by supplementing the existing research on business portfolio realignment as a means of value creation. This study argues that a novel contribution to finance research is important as the adoption of corporate divestiture practices shifted towards being more voluntary and proactive after the 2008 global financial crisis, changing the value creation mechanisms. This research adds to this literature by examining whether the post-asset sell-off financial performance and shareholder value of technology companies headquartered in the European Economic Area improved.

Based on the findings, the results are consistent with theoretically based predictions regarding financial performance as the interdependence between asset sell-offs and improved financial performance holds. The increases potentially arise from improvements in asset productivity as the profitability of the sample companies, measured by the EBITDA margin, increases with the *CFRs*. These findings suggest that divesting assets to concentrate on core assets, generally restructure or strengthen the business and operations, or raise cash through disposal increases focus in the long term and bolsters operational competency through improved technological relevance as capabilities and resources can be managed and leveraged more efficiently. The realignment with a cost reduction strategy, improved management of assets, generates more immediate and tangible results for companies than realignment strategies aiming to facilitate revenue growth. Thus, it appears that redeploying resources and capital so that they are reflected in financial figures other than profitability metrics takes more than 4 years in some cases.

Conversely, the change in strategic focus and restructuring of operations, that is, towards realignment strategies aiming to facilitate revenue growth, appear to heavily burden the performance of some companies, and the 4-year post-asset sell-off period is too short to evaluate the real performance effects in some cases. As illustrated by the figures, 36.73 % of the sample companies experienced a decrease in their median EBITDA margin in the post-asset sell-off period. The results also imply that the relative size of asset sell-off is an irrelevant factor in determining the magnitude of changes in economic performance.

The capital market appears to consider reallocation positively in the long term since in the short term, asset sell-offs tend to depress the profits of some companies for the first 2 years. As reported in this study, valuation multiples increase annually after asset sell-offs. Therefore, the problem does not appear to be confirming the strategy; the problem is implementing it and redeploying resources and capital so that the strategy is reflected in the company's financial figures, which takes more than 4 years in some cases. Thereby, the decision to dispose of assets requires management to consider the short-term performance against long-term prospects.

The results of this study should not be generalized to other geographical areas, industries, or time periods. For instance, different geographical areas, industries, and sample periods affect the results as not all industries and geographical areas are necessarily driven by the same or equally strong trends.

Although this research aims to add to the literature, several interesting questions worth exploring arise from the findings. First, as the 4-year post-asset sell-off period was found to be insufficient to evaluate the real economic impacts of the change in strategic focus and restructuring, a longer post-asset sell-off period would further illuminate the implications for long-term performance. Second, as for voluntary asset sell-offs to raise cash through disposal, adding completed asset acquisitions after asset sell-offs in the investigation would offer another strategic dimension to the examination. Moreover, it would be worthwhile to challenge and supplement the findings of this study with another geographical area or shareholder value metric. These remain for future research.

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Appendices

Appendix 1 CFRs with and without announcement revaluation

Appendix 1 reports the annual medians of CFRs during pre- and post-asset sell-off periods. Furthermore, the sector-adjusted medians of the CFR and the relative proportion of positive sector-adjusted CFRs in the sample are reported. The symbols ** and * denote statistical significance $p < 0.05$ and $p < 0.10$ using a two-tailed test.

	CFR revaluation included			CFR revaluation excluded		
Year relative to asset sell-off	Median	Sector-adjusted		Median	Sector-adjusted	
		Median	Positive		Median	Positive
Year -4	0.113	0.007	53.4 %	0.107	0.05	52.8 %
Year -3	0.097	-0.009	43.2 %	0.092	-0.009	42.6 %
Year -2	0.098	-0.004	48.6 %	0.098	-0.004	47.9 %
Year -1	0.104	-0.002	49.7 %	0.104	-0.002	49.7 %
Year 1	0.108	0.013	60.3 %	0.106	0.013	59.3 %
Year 2	0.120	0.029 **	62.7 %	0.110	0.015 *	59.8 %
Year 3	0.113	0.032 **	64.8 %	0.103	0.020	60.0 %
Year 4	0.098	0.015	57.4 %	0.094	0.012	57.4 %