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**"FOREIGN CASH HOLDINGS AND CORPORATE SOCIAL
RESPONSIBILITY: AN EMPIRICAL ANALYSIS"**

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TABLE OF CONTENTS

1. INTRODUCTION	1
2. LITERATURE REVIEW AND RESEARCH HYPOTHESES.....	3
2.1 <i>THESIS ON CASH HOLDINGS</i>	3
2.2 <i>ACCUMULATION OF CASH HOLDINGS</i>	31
2.3 <i>CORPORATE SOCIAL RESPONSIBILITY</i>	40
2.4 <i>CASH HOLDINGS AND CSR</i>	70
2.5 <i>RESEARCH HYPOTHESES</i>	72
3. DATA.....	74
3.1 <i>SAMPLE</i>	74
3.2 <i>DESCRIPTIVE STATISTICS</i>	91
3.3 <i>CORRELATION</i>	94
4. EMPIRICAL RESULTS AND ROBUSTNESS TESTS.....	96
4.1 <i>EMPIRICAL RESULTS</i>	96
4.2 <i>ROBUSTNESS TESTS</i>	108
5. CONCLUSION.....	119
REFERENCES.....	122

1. INTRODUCTION

U.S. multinational foreign cash holdings have represented a hot topic since a renowned 2007 paper published by The Journal of Financial Economics (Foley et al., 2007). That essay highlighted how the to the accumulation of cash in foreign subsidiaries was an attempt to minimize taxation. By keeping cash abroad, firms could avoid the 35% repatriation tax imposed by the Internal Revenue Code.

The problem had already been identified by politics. Three years before, the United States Congress enacted a tax holiday in section 965 of the American Jobs Creation Act of 2004, allowing companies to repatriate foreign cash at a 5.25% tax rate, in exchange of some restriction on how that cash could be spent – essentially repatriated funds could be used to distribute dividends, repurchase shares or acquire participations in other businesses (Laplante and Nesbitt, 2017). According to the U.S. Internal Revenue Service, 843 corporations repatriated just 362 billion of dollars, against estimated 9700 firms with a total of trillions of offshore cash piles¹.

The failure of the operation can give rise to doubts about the reliability of the tax motive to hold foreign cash identified by Foley et al. (2007). Indeed, other researchers found no support for the hypothesis that U.S. firm accumulated cash abroad because of a tax optimization strategy (Bates et al., 2009; Pinkowitz et al., 2016).

Academics are far from reaching an agreement on the topic. The interest on cash holdings is particularly recent. It soared only after a 1999 seminal publication by Opler, Pinkowitz, Williamson and Stulz, which has been the paradigm for cash holdings studies.

Foreign cash holdings can be formed for the same reasons which led enterprises to hoard cash domestically. Academics have identified three main possible drivers, different from the tax motive, of the accumulation of cash reserves: the transaction motive, the precautionary motive and the agency motive. Numerous theories with implications in terms of cash holdings have been developed. Some derive from the capital structure research (target adjustment model, financing hierarchy theory...). Others put emphasis on information asymmetry (flexibility hypothesis, spending hypothesis...). Additional theories link cash holdings with different features of a corporation (product market competition hypothesis, life cycle hypothesis...). Since there's still no widely accepted argument on the determinant of corporate cash holdings, the research on foreign cash holdings has been very limited.

¹ <https://www.marketwatch.com/story/trumps-tax-holiday-wont-make-much-of-a-difference-without-corporate-tax-reform-2016-12-08>

In this context, it's interesting to verify if a relationship between Corporate Social Responsibility (CSR) and foreign cash holdings can be drawn. It is the objective of this master thesis.

Nowadays, CSR is one of the most investigated topic in the economic literature (Cheng et al., 2014), because the general public has become extremely interested in the matter (Wiengarten et al., 2017). But to the best of my knowledge, only three scientific papers have jointly investigated CSR and cash holdings (Arouri and Pijourlet, 2015; Cheung, 2016; Lu et al., 2017). Arouri and Pijourlet (2015) and Lu et al. (2017) studied the relationship between the value of cash holdings and, respectively, the CSR performance and the quality of CSR disclosure. Only Cheung (2016) examined if CSR can explain the level (not value) of cash holdings. Nobody has analyzed if a connection between CSR and the level of foreign cash exists.

As Davis et al. (2015), I consider only the environmental and social dimension in measuring CSR and control for corporate governance separately. The research questions, based on the existing literature, are two: is a stronger CSR commitment related to a lower percentage of foreign cash holdings? Does an effective corporate governance structure enhance the relationship between CSR and the percentage of foreign cash holdings? I try to answer them by means of a two-stage least square regression and an extension of the model employed by Opler et al. (1999).

The study is organized as follows. First, I provide a review of the cash holdings literature. Second, I introduce the main attributes of the CSR research which is of interest in terms of the questions addressed. Successively, I briefly summarize the three papers investigating the relationship between CSR and cash holdings. Then, the research hypotheses are properly formulated. The data inspected is exhibited, including an explanation of the sampling methodology and of the variables. Descriptive statistics and the correlation matrix are shown. The empirical results come after. Robustness tests are displayed. Lastly, the conclusion recaps the results and states the main research limitations.

2. LITERATURE REVIEW AND RESEARCH HYPOTHESES

This chapter is divided in five sections.

The following section illustrates first the main theories on cash holdings. Successively, the main reasons that firms may have to hoard cash are presented. The third part provides a brief introduction of the concept of Corporate Social responsibility (CSR). The research on the connection between CSR and financial performance, taxes, access to finance and legal systems are reviewed. Then, the literature linking CSR and corporate cash is summarized. Finally, the research hypotheses are formulated.

2.1 THESIS ON CASH HOLDINGS

Financial decisions have a fundamental role in an enterprise management. A wrong decision may threaten the survival of a company (Denso and Adomako, 2014). Corporate cash policy is of relevance: it directly impacts on the risks of the claims of investors (and consequently, on securities' returns). The market hasn't much control on the matter and managers have a lot of discretion (Liu et al. 2014).

Corporate cash holdings have constantly increased worldwide in the last decades. This event cannot be explained with firms' characteristics alone (Bates et al., 2009). U.S. company have hoarded more cash than the average (Fernandes and Gonenc, 2016). Cash holdings on assets has doubled since the 1970s in North America (Boileau and Moyen, 2010). Pinkowitz et al. (2016) highlighted that the phenomenon is due to large research and development-intensive firms, found nearly exclusively in the United States socio-economic fabric.

The evidence has drawn the attention of the academic world. The first scientific study on cash holdings can be traced back to the 1930s. But it's only after 1999, following an influential publication by Opler et al., that the topic has been thoroughly investigated (Ferreira and Vilela, 2004).

The cash holdings research is arguably still in its infancy. Chand and Dasgupta (2009, p. 14) noted that "*we do not know a great deal about the reasons underlying firm's financing decisions*". Therefore, it is useful to consider the cash holding research's evolution and the various theoretical branches of the field.

The origin of the modern cash holdings' literature lies in area of capital structure choices. Specifically, in Modigliani and Miller (1958) seminal work.

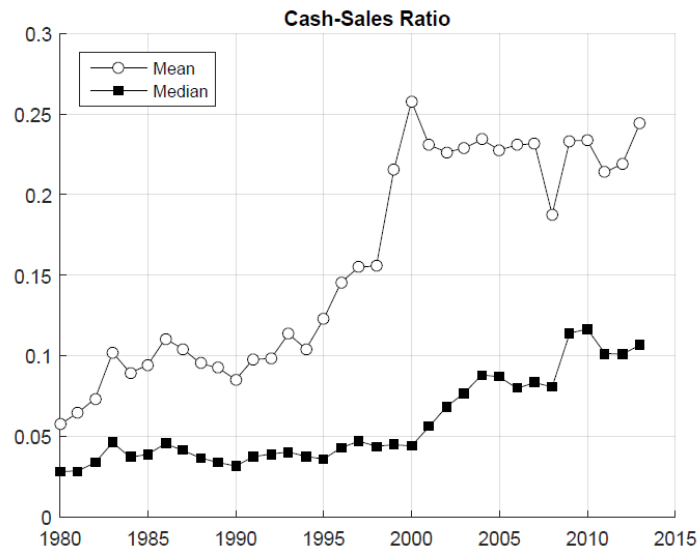


Figure 1: U.S. nonfinancial firms' cash-sales ratio from 1980 to 2015.

Source: Adão and Silva, 2017.

Modigliani and Miller Propositions I and III

The Modigliani and Miller model was the first generally accepted capital structure theory (Luigi and Sorin, 2009). It stemmed a whole branch of corporate finance focused on capital structure. It is often referred as the capital structure irrelevance theorem.

Modigliani and Miller (1958) assumed that corporate assets grant a perpetual stream of profits to the stockholders. This stream is assumed to be a random variable subject to a probability distribution. They also assumed that firms can be divided in different classes of return.

Companies in the same class are homogeneous. Modigliani and Miller (ibidem, p. 9) found that, in a perfect capital market, *“the market value of any firm is independent of its capital structure”*. Arbitrage opportunities push the market value of a company to the sum of its equity and debt, as corporate securities in the same class are perfectly substitute. In other words, the cash flows' probability distribution isn't related to the firm's capital structure (Jensen and Meckling, 1976).

Modigliani and Miller Proposition III (generally not remembered) is of interest in terms of cash holdings literature. Modigliani and Miller (1958, p. 29) noted that *“the cut-off point for investment in the firm... will be completely unaffected by the type of security used to finance the investment”*. The internal rate of return of a project will not change whether a company retains earnings and hoard cash, or issue new bonds or shares to finance the project (*“the three major financing alternatives open to the firm”*, ibidem, p. 29).

Considering Propositions I and III together, we can conclude that cash holdings have no impact on the attractiveness of an investment. But as Modigliani and Miller (ibidem, p. 33) specified: *“this does not mean that the owners (or the managers) have no grounds whatever for preferring one financing plan to another; or that there are no other policy or technical issues in finance at the level of the firm”*. The irrelevance theorem doesn't provide any guidance on how to interpret the corporate choice between holding cash and alternative asset allocation possibilities (debt reduction, investments in tangible assets, investments in intangible assets, dividend distribution, etc.).

The Modigliani and Miller model assumptions are particularly strict. The main assumptions of the capital structure irrelevance theorem are (Shashar et al., 2015):

- 1) No transaction or bankruptcy costs exist.
- 2) Risks are equal among firms in the same class.
- 3) Taxes are neutral (only corporate taxes exist). If we consider taxes, the market value of a company is proportional to its return less taxes paid (Modigliani and Miller, 1958). This consideration was corrected in a later revision (Modigliani and Miller, 1963).
- 4) Firms' cash flows are constant over time (growth rate=0). This assumption is fundamental since it allows to approximate cash flow with EBIT.
- 5) There is no information asymmetry.
- 6) There is no moral hazard (managers operate only in the interest of shareholders).
- 7) Only risk-free debt and risky equity exist (no hybrid securities are used).

Academic researchers found that the mix of sources of financing used by a company impacts the firm value (Shashar et al., 2015) in a more realistic world, where no perfect capital market exists (Weidemann, 2017). Cash holdings are irrelevant only with perfect capital markets (Opler et al., 1999).

Firms characteristics and other factors have been comprehensively investigated to identify the elements influencing the level of cash holdings. Several elements can disprove the Modigliani and Miller's Model, originating multiple alternative theories (Luigi and Sorin, 2009). But theories which focus on the cost of capital or several frameworks on capital structure, although meaningful in their own, have no practical consequences for studies on cash holdings.

Post Modigliani-Miller theories

Some major and minor theories with implications in terms of cash holdings have emerged, especially in the capital structure field (Tahir et al., 2016). They can be summarized in three main lines (see Weidemann², 2017):

- 1) Capital structure research-derived theories:
 - Trade-off theory/target adjustment model
 - Pecking order/financing hierarchy theory
 - Market timing/windows of opportunities theory³
- 2) Agency conflicts theories:
 - Free cash flow theory/flexibility hypothesis
 - Risk aversion/reduction hypothesis
 - Constrained liquidity theories
 - Hedging perspective⁴
 - Spending hypothesis
 - Defense against hostile takeovers hypothesis
 - Shareholder power/financial contracting hypothesis and alignment hypothesis
 - Costly contracting hypothesis
- 3) Other theories:
 - Diversification hypothesis
 - Culture/institutions hypothesis
 - Product market competition hypothesis
 - Life cycle hypothesis
 - Customer relationship hypothesis
 - Research and development smoothing hypothesis

Capital structure theories agree on the determinants effect on the level of cash, but not on the effects on profitability. Agency conflict theories are much more varied.

² Weidemann (2017) distinguished only among capital structure and agency costs theories, including significantly less frameworks than what is presented here. I couldn't find an all-encompassing classification in the literature. The scheme used is a personal elaboration.

³ The market timing theory can be considered a major capital structure theory. But (as far as I know) it hasn't been explicitly investigated in cash holdings' research. Here, I assume that (the very few) studies linking the distribution of cash holdings over time to macroeconomic and market factors are on the same page of Baker and Wurgler (2002).

⁴ Adão and Silva (2017) introduced the hedging perspective as a constrained liquidity theory. Weidemann (2017) considered it a flexibility hypothesis theory. In my opinion, the originality of Acharya and al. (2007) work warrants a stand-alone classification.

These theories do not necessarily exclude each other (Luigi and Sorin, 2009). They “*are conditional, not general*” (Myers, 2003, p. 31). They are complementary because they can explain the behavior of firms in different situations (Serrasqueiro and Caetano, 2015). The trade-off theory is suited to companies which give no priority to specific issues. The pecking order theory works best in case of financial constrained firms and in countries where investors’ protection is weak (Myers, 2002). Agency conflict theories assume importance if the information asymmetry is severe. The interaction among these theories isn’t clear (Weidemann, 2017).

Different models can reach similar empirical predictions, making it difficult to distinguish empirically among them (Opler et al., 1999). No theory alone can describe all observed corporate finance behaviors. Even considering two theories at the same time may not be sufficient and lead to inconclusive explanations (Adair and Adaskou, 2015). Tahir et al. (2016) argued that the mixed empirical results reached in the literature could be due to studies investigating cash policy at firm level, instead that for each sector. Graham and Harvey (2001, p. 47) suggested that “*perhaps the theories are valid descriptions of what firms should do-but corporations ignore the theoretical advice*”.

1) Capital structure research-derived theories

Capital structure theories focus on a firm entire financing decisions. Agency problems are only one of several sets of issues considered (Weidemann, 2017).

The trade-off theory/target adjustment model

These terms are used to describe a set of theories which follow a similar approach. The trade-off theory is based on the path traced by the first Modigliani-Miller (1958) model (Adair and Adaskou, 2015). It is the first post-Modigliani Miller Proposition theory (Shashar et al., 2015). It avoids some of the most unrealistic assumptions of the Modigliani and Miller framework, especially by considering taxes (Modigliani and Miller, 1963).

There are two main branches of trade-off theories: static trade-off theory and dynamic trade-off theory.

Static trade-off theory

Modigliani and Miller (1963) gave indirectly origin to this set of theories. They showed that the statutory corporate tax rate and debt influence a company’s value. Various costs - “*the need for preserving flexibility*”- (ibidem, p. 11) will avoid a company to be financed only by debt.

In the static trade-off theory, a firm identifies the optimal capital structure which it tries to approach over time (Adair and Adaskou, 2015) to minimize deviation costs (Chang and Dasgupta, 2009). This capital structure is determined as a trade-off between the tax shields and costs of financing (including bankruptcy costs). Tax shields makes debt more attractive than other form of financing (Serrasqueiro and Caetano, 2015). The company's assets and investments decisions are assumed constant.

There are 3 main types of static trade-off theories (Ghazounai, 2013):

- 1) Trade-off theories on bankruptcy costs: historically, it is the first trade-off theory formulated. A company's assets and investments decisions are assumed constant. The firm identifies the optimal capital structure and tries to reach it. This capital structure is determined as a trade-off between the tax shields and costs of financing, including bankruptcy costs. Bankruptcy costs arise when the probability of default of the firm is perceived positive (Shashar et al., 2015). Tax shields makes debt more attractive than other form of financing (Serrasqueiro and Caetano, 2015).
- 2) Trade-off theories on agency costs between managers and shareholders: It is an application of the principal-agent problem. The tax shield of debt alone cannot justify a firm capital structure "*since we know debt was commonly used prior to the existence of the current tax subsidies on interest payments*" (Jensen and Meckling, 1976, p. 40). Managers' activities in their own interests "*can be limited (but probably not eliminated)*" (ibidem, p. 12) by shareholders' costly monitoring actions. Increasing debt reduces the costs incurred by stockholders to control the management: the creditors will also control the company and the burden will be split. Bankruptcy costs are one aspect of agency costs of debt. The target capital structure is reached when the marginal benefit of the strengthened external control is equal to the marginal cost of debt.
- 3) Trade-off theories on agency costs between creditors and shareholders: the value maximizing capital structure should minimize the agency costs of conflicts of interests between creditors and stockholders (Myers, 1977). Similar theories can explain the financial decisions of several small and medium enterprises in which there's no separation between control and management (Adair and Adaskou, 2015). Shareholders have a limited downside (they can lose at maximum the equity hold in the company) but an unlimited upside (a company's growth and profitability have theoretically no identifiable limits). Creditors have both limited downside (the principal) and upside (interests and loan repayment). Shareholders are more inclined to let the company

undertake risky investments. The conflict of interest peaks in a near-bankruptcy situation: stockholders' claims value in the firm is nearly null, so they're willing to invest in extremely risky projects; creditors want to preserve the remaining value of the company, avoiding new uncertain investments. Near bankruptcy, shareholders don't want to provide new equity because the related yields will principally increase the creditors' claims. Whenever creditors are unsure that they will be paid they suffer a cost. These cost makes the optimal debt/equity ratio lower than what predicted by Modigliani and Miller Proposition I (Myers, 1977). Cash proceeds from issuing bonds increase the agency costs.

The debt-to-value ratio is changing until the optimal capital structure is achieved. It follows that a firm should also have an optimal cash holding level, associated with the value-maximizing capital structure. A trade-off between cash's benefit - no external financing transaction costs, no under-investments, lower likelihood of financial constraints (Ferreira and Vilela, 2004) - and costs - under-investments, no debt tax shield, agency costs related to management - exists. Empirical data suggest that the rebalancing does not happen immediately if costs and benefits change for whatever reason (Kaihan and Titman, 2007). Determinants of cash holdings are: access to capital markets, existence of alternatives to liquidity, level of investments in tangible and intangible assets, capital structure, tax rate, information asymmetries (Weidemann, 2017).

Dynamic trade-off theory

The dynamic trade-off theory argues that companies' decisions are based on expectations of financial needs in future periods (Denso and Adomako, 2014). They try to adjust their asset allocation to their future needs as fast as possible (Luigi and Sorin, 2009). The optimal capital structure and related level of cash holding can never be achieved due to market imperfections. For example, issuing costs will prevent a firm from reaching its target (Ghazounai, 2013). Companies simply move towards, but never reach, their target. But if the adjustment period towards the target is very long (due to considerable adjustment costs) the trade-off model is not particularly useful (Myers, 1984).

Brennan and Schwartz (1984) and Kane et al. (1984) were the first to use a dynamic model. No transaction costs were included in their analysis.

They considered both firm's investment opportunities and financing decisions. A (single asset) company's cash flow is a function of the current⁵ investment policy. The current optimal capital structure depends on the current cash flow and actual capital structure. The actual capital structure in turn depends on the past profitability. This chain implies that companies that are similar today may take completely different financial decisions due to divergent histories. In terms of cash holdings, it suggests that we should look at historical trends of single firms more than comparing companies among them⁶.

Kane et al. (1984) found that the cost of deviating from the optimum is small if the tax advantage of cost is low. The model assumes that firms make their financial decision at maturity looking only one period ahead and that they may go into bankruptcy only at maturity. This "*multiperiod interpretation*" (ibidem, p. 12) suggests that the traditional importance given to the tax shield may be overstated. The trade-off theory can't explain well corporate financial decisions. It doesn't envisage companies which hoard cash and are not leveraged if debt has tax advantages.

Fischer et al. (1989) developed the first dynamic trade-off model with transaction costs. They assumed that companies can rebalance at any time. Investments are fully financed by retained earnings (i.e. cash) and firms do not distribute dividends. As Brennan and Schwartz (1984), Fischer et al. found that companies with similar growth rate in the past exhibit a similar financial behavior. In the absence of transaction costs, firms should be extremely leveraged to capture tax shield benefits at the cost of only a modest increase in risk. Highly leveraged companies should issue new debt to finance investments, since the higher the debt risk (and related interest expenses), the greater the tax benefit of debt (a "*counterintuitive result*", ibidem, p. 13). They concluded that even small recapitalization costs can greatly influence capital structure choices. Considerations on future transaction costs of external financing may impact on the optimal amount of cash holdings.

This result was corroborated by Bolton et al. (2013), which studied the financial decisions of (again, single-asset) financially constrained firms. The cost of external financing determines an optimal retained earnings policy for companies and a precautionary demand for cash. The debt servicing costs are higher than what described by the classical trade-off theory, because debt reduces a company valuable precautionary cash holdings. Debt value is overstated and

⁵ "*It is assumed that new investment contributes to profit instantaneously*" (Brennan and Schwarz, 1984, p. 8). This assumption is too unrealistic in my opinion. However, it must be noted that the model keeps into consideration previous period investments, as the baseline year x cash flow growth rate is influenced by the year $x-1$, $x-2$, ... investments.

⁶ A similar approach would probably lead to issues of independence due to autocorrelation.

cash value is undervalued. The tax benefit of debt can be negative if the firm is running out of cash. Cash cannot be considered as negative debt – an argument already proposed by other researchers (Acharya et al., 2007). Financially constrained companies may also not use their full risk-free debt capacities to preserve their cash holdings. Cash has a shadow value and a shadow cost.

For financially constrained businesses, the optimal financial decisions are a consequence of the trade-off between the tax benefit of debt and the debt servicing costs. Bolton et al. (2013, p. 5) noted that “*the liability structure (how much debt to issue)*” is correlated with “*the asset structure (how much cash to hold)*”. If the cash flows volatility increases companies should increase both cash and debt, contrary to the traditional trade-off theory. Brick and Liao (2013) verified that the more(less) a firm is liquid, the more (less) it is indebted.

A problem with this framework is that it does not explain the liquidity (in the form of cash or credit line) of financially unconstrained firms. Those businesses are assumed to simply modify their debt level (and not their treasuries) in case of environmental changes.

Evidence on the trade-off theory

The academic research has provided mixed results on the effectiveness of the trade-off model in predicting real world companies' choices (Ghazounai, 2013). Myers (1984) argued that the framework does not provide a clear-cut representation of real world financial decisions, except for highly indebted enterprises. The theory gives no justification for the large differences in debt/equity ratio of apparently similar firms. It can only explain only a small part of firms' behavior. Kaihan and Titman (2007) argued that firms move towards their target ratio in the long term. Bolton et al. (2013) noted that the traditional trade-off theory is acceptable only for firms with no external financing costs. Graham and Harvey (2001) observed that large companies are more likely to have a target debt ratio. But Serrasqueiro and Caetano (2015) affirmed that small businesses tend to move towards their optimal capital structure. Chang and Dasgupta (2009) showed that it's possible to observe a supposed shift towards the target structure even if there is no real adjustment but only random fluctuations of the capital structure. On the other hand, firms may not show a target behavior even though they try to optimize their structure if the costs of deviation from the optimum are small (Kaihan and Titman, 2007). Opler et al. (1999) found that the static trade-off theory is empirically relevant, but it can't explain why some firms hold so much cash.

Overall, the results of empirical studies are confusing.

The pecking order/financing hierarchy theory

The pecking order theory was suggested by Donaldson in a 1961 survey of U.S. firms' financial decisions (Myers, 1984).

It argued that internal financing is generally preferred and that "*firms adopt a hierarchy in selecting sources of finance*" (Serrasqueiro and Caetano, 2015, p. 3). Cash holdings or marketable securities are used if the cash flow generation cannot sustain the investment needs. When external funding is required, the safest securities available is used (Myers, 1984). Debt is preferred to equity (Adair and Adaskou, 2015).

Myers and Majluf (1984) created a model which can explain why firms may prefer to use internal resources instead of collecting funds from the market. This framework is nowadays used as a proxy for the whole pecking order theory. It isn't based on the managerial view of corporate finance, but focuses on a situation of asymmetric information (Tahir et al., 2016), following Akerlof (1970) lemon premium in the lemon market. It also stems from the slack resource theory. It reaches approximately the same results of the previous pecking order theories.

A limited liability company operates in an efficient capital market with respect to publicly available information. Issuing securities has no cost. The company may not undertake value creating projects if it needs to issue new stocks at a discount to finance those projects. Managers are assumed to have more information than investors and act on behalf of existing shareholders.

Transmitting information is costly. Managers will not pursue a profitable investment opportunities if the cost for the current shareholders (in terms of shares offered at a bargain price) outweighs the project's net present value. The greater the information asymmetry, the worse the problem is (Shashar et al., 2015). There is a mismatch between the return for existing shareholders and the return for the whole market - private and social returns in the lemon model (Akerlof, 1970). The issue persists until a company is undervalued (Weidemann, 2017). Under these hypotheses, a company with significant financial resources have an intrinsic advantage: it will not pass up any value creating project.

Hoarding cash "*has value because without it the firm is sometimes unwilling to issue stock and therefore passes up a good investment opportunity*" (Myers and Majluf, 1984, p. 14).

Internal funds allow to avoid the consequences of a conflict between old and new shareholders. Cash holdings are especially valuable if the company has filled its low-risk debt

capacity. The full debt capacity point is comparable to the target suggested by the trade-off theory (Shashar et al., 2015), but firms do not have target cash levels (Ferreira and Vilela, 2004). Internal financing is assumed to be preferred to external sources. Highly profitable businesses rapidly accumulate cash, as they restrict the distribution of dividends (Adair and Adaskou, 2015). Cash holding determinants are the same suggested by the trade-off theory (Weidemann, 2017).

Cash holdings lose their “*ex-ante* [positive] NPV” (Myers, 1984, p. 13) if investors are active. Financing becomes irrelevant in terms of investment decisions. In a similar situation, even companies with a large availability of liquidity will not undertake all value creating projects.

Pecking-order models explain why companies prefer internal financing. Corporations frequently modify their debt, but rarely change their equity (Chang and Dasgupta, 2009). The pecking order theory is generally acceptable for mature enterprises which can generate a substantial cash flow (Serrasqueiro and Caetano, 2015). However, according to Chen et al. (2015), young firms around the world have a greater level of cash holdings than mature companies⁷.

Graham and Harvey (2001) found that the hierarchy suggested by this framework is followed, but information asymmetry is not the cause. The pecking order paradigm can't motivate why some firm issue new equity when lower risk instruments such as investment-grade debt or hybrid securities are available (Myers, 1984). Most importantly, Opler et al. (1999) argued that the pecking order model does not provide a specific guideline on the optimal level of cash holdings. The optimal capital structure doesn't translate in an optimal level of cash. Changes in internal resources influence the treasury, but it's indifferent to repay debt or accumulate cash. Cash is considered negative debt. A firm may have high cash holdings and high debt or low cash holdings and low debt. In both cases, the firm's value is the same if the net debt is at the optimal level. Consequently, shareholders should be indifferent on the amount of liquidity their company holds.

⁷ This result is controversial. It isn't robust when U.S. firms are excluded from the sample used by the authors.

Market timing/windows of opportunity theory

The market timing theory is one of the most recent capital structure theory (Danso and Adomako, 2014). It directly follows the results provided by the Myers and Majluf (1984) model.

Its origin is in studies of securities' issuance. Bayless and Chaplinsky (1996) used the volume of equity issues to find if there is a favorable time to raise capital. They showed that windows of opportunity exist when the information asymmetry is reduced. Managers should take advantage of such periods to "time" the market.

The theory affirms that capital structure choices are influenced by the market valuation of equity (Luigi and Sorin, 2009). It argues that firms issue new equity when the share price is overvalued. Conversely, companies repurchase shares (or distribute dividends) when these shares are undervalued (Baker and Wurgler, 2002). They arbitrage a real or perceived market mispricing. A company's capital structure is a function of past market values. It is caused by attempts to time the market.

Baker and Wurgler (2002) hypothesized that 2 models of market timing theory, leading to similar outcomes, are possible:

- 1) Managers and investors are rational. Companies rely on external funding when the information asymmetry is at its lowest point. Cash holdings will be accumulated when the information asymmetry is high. The information asymmetry is at its minimum after an information disclosure, such as relevant press releases and annual reports (Graham and Harvey, 2001). A possible postulate is that the cash holdings disclosed by companies in the annual reports is higher than the average, since it describes a point in time when information asymmetry is high. This idea is consistent with Adão and Silva, who argued (2017, p. 17) that "*the opportunity cost of holding cash implies that it is optimal to start a holding period with more cash than in the rest of the holding period and spend this cash gradually until the next transfer, which initiates a new holding period*".
- 2) Investors (and sometimes managers) are irrational. The management use external sources of financing when it believes that investors' expectations are irrational. This second version of the market timing theory has the advantage of not requiring the market to be inefficient (Baker and Wurgler, 2002). Information asymmetry isn't needed. Cash holdings would flow according not only to the financial needs of the company but also based on the cash opportunity cost, as interpreted by management.

In a popular survey, Graham and Harvey (2001) reported that the current valuation of shares is one of the main element considered by CFOs to issue common stock. Companies delay issuing new securities until the information asymmetry is minimized. Firms which do not pay dividends suffer more from this kind of information asymmetry. For them, correctly timing the window of opportunity is most relevant. They also try to time the interest rate (and some firm also the credit worthiness). Myers (2003) affirmed that market timing theory complements the order-pecking theory, explaining empirical evidence not predicted by Myers and Majluf (1984).

Strictly in the cash holdings literature, we find a similar idea in Keynes' (1936) speculative motive. It affirms that companies have an incentive to keep cash if their expectations on the future interest rates are higher than the market. Firms invest only when the interest rates increase to the level they expect. The variation of cash holdings is a consequence of a profit-maximization strategy. This suggests that firms accumulate cash when the management values that it is most profitable/less costly, looking at the current market conditions. Companies should also hoard cash when they can minimize the related costs, in accordance with the transaction motive.

The speculative motive hasn't been successful among researchers. It quickly went out of fashion, whereas the other two reasons to hoard cash identified by Keynes (the transaction motive and the precautionary motive⁸) are still debated. Miller and Orr (1966, p. 6, note 9) argued that *"most of any speculation on a fall in interest rate would take the form of shortening the maturity structure of the portfolio rather than building up cash holdings"*. The interest rate, affecting the opportunity cost of cash, influences the demand for cash by firms. But it can't be the only determinant of cash holdings (Bacchetta et al., 2014).

The virtue of the speculative motive and of the market timing theory is establishing a connection between the market valuation and financial decisions, beyond the reduction of external liquidity considered by the precautionary motive. In terms of capital structure, traditional theories cannot explain why low leveraged firms generally raised funds when overvalued, whereas highly indebted companies raised funds when undervalued (Shashar et al., 2015).

Macroeconomic factors influence corporate decisions on cash holdings. The market phase, especially the monetary policy trend, may play a relevant role. Firms with smaller cash holdings take less time to adapt to a monetary shock than companies with large cash reserves.

⁸ See chapter 2.2.

The latter can only adjust transactions in the very-short term, until they can make a transfer (Adão and Silva, 2017). Companies with smaller revenues allocate proportionally more cash in their portfolio of assets. The level of cash holdings determines a business' exposure businesses to the risk of a shift in monetary policy.

Kaihan and Titman (2007) found in an empirical study that the market timing theory can explain financial decisions in the short term, but after a 5-year period the market timing effects disappear. Bates and al. (2009) found no evidence of increased cash holdings for U.S. IPO firms, which usually issue seasoned equity a few years after the IPO. The capital raising activities do not influence the level of cash holdings in their sample. The increase in cash holdings is due to the riskier businesses of newly listed companies over time (the precautionary motive).

2) Agency conflicts theories

Agency conflicts theories focus on the cost arising from conflicts of interest between owners and non-owner managers. They put emphasis on information asymmetry (Weidemann, 2017). Most agency conflict theories predict that the more pervasive the agency problems, the higher the cash holdings that corporations keep (Pinkowitz et al., 2016)⁹.

Free cash flow theory/ flexibility hypothesis

Jensen (1986) affirmed that dividends reduce managers' power. They reduce the resources that managers control. Managers have the incentive to keep income in the company instead of distributing it to shareholders, since "*the objective of [...] managers is to maximize their own wealth, while securing control over decision making vis-à-vis external actors*" (Adair and Adaskou, 2015, p. 3). In this way, they can finance projects which would not be financed by the market (with a return lower than the cost of capital or even with a negative return) and gain authority.

The problem is greater in companies with high free cash flow. Free cash flow is defined as "*cash flow in excess of that required to fund all projects that have positive net present value when discounted at the relevant cost of capital*" (Jensen, 1986, p. 1).

Companies in which managers aren't effectively controlled should hold more cash (Harford et al., 2008). The issue cannot be easily solved by aligning management and shareholders'

⁹ Pinkowitz et al. (2016) affirmed that *all* agency theories predict a positive linear relationship between the intensity of agency problems and the amount of corporate liquid assets. This is obviously a generalization, and doesn't always hold true (e.g. spending hypothesis).

interests. Managerial ownership (e.g. stock grants) reduces excess cash if this cash damages shareholders' wealth. But managerial ownership also increases cash holdings if managers become more risk averse due to being personally committed to the enterprise (Opler et al., 1999).

Firms with excessive cash holdings have a suboptimal capital structure. Hoarding cash is critical in mature companies (high cash flow, low growth rate), as distributing excess cash and issuing bonds puts pressure on the management to effectively conduct the business, since it has to meet the debt service. Debt has not only a control function, but also tax advantages (Jensen, 1986).

Empirical evidence on the free cash flow theory is not conclusive (Tahir et al., 2016). It has been both positive (Harford, 1998; in Opler et al., 1999) and negative. Opler et al. (1999, p. 10) argued that *“in general, the agency costs of managerial discretion are less important [among factors influencing the level of cash holdings], and may be trivial for firms with valuable investments opportunities, because the objectives of management and shareholders are more likely to coincide”*. If a company is properly directed, management's overinvestments will not destroy value for stockholders (Dittmar and Mahrt-Smith, 2007).

Constrained liquidity theories

Constrained liquidity theories are similar to the free cash flow theory. They highlight a single main factor behind cash hoarding instead of a general underinvestment issue (Weidemann, 2017). They are an application of the precautionary motive. The general idea is that firms envisaging future financial constraints increase the present level of cash holdings. This concept has been strongly questioned among academics since a 1988 Fazzari, Hubbard and Petersen paper, which first addressed the issue of firm financing constraints (Azmat and Iqbal, 2017).

Opler et al. (1999) found that managers accumulate cash whenever they can. The fear of future underinvestment isn't the only reason. High growth rate, risky activities, small balance sheet, low credit rating and restricted access to capital markets all are factors leading to higher cash reserves. They can't be only related to the risk of not taking advantage of profitable investments opportunities. Multiple elements constraining the possibility to swiftly modify the liquidity level tend to be associated with higher cash holdings. Credit rating is probably the most relevant element affecting financial decisions (Graham and Harvey, 2001).

Cash flow volatility can significantly explain the variation of cash holdings in financially constrained firms (Han and Qiu, 2007). If the future cash flows are expected to be more

volatile, constrained companies will increase the level of cash holdings by reducing current investments. The objective is to avoid missing future value-creating projects. This is true both in developed and developing countries (Azmat and Iqbal, 2017). Moreover, Harford et al. (2014) found that shorter debt maturities are associated with cash rich companies. The relationship is stronger when the credit market is contracted, because the refinancing risk is higher.

A functioning and advanced banking sector is needed for an effective cash management (Tsamenyi and Skliarova, 2005). Banking debt can reduce the asymmetry and agency costs of other forms of debt. Firms can reduce costs through banking debt if banks are not too powerful. Closer relationships to banks are associated with lower level of cash holdings (Ferreira and Vilela, 2004).

In a study on Chinese companies, Chan et al. (2014) identified three channels which influence the level of cash holdings: access to bank loans, trade credits and foreign direct investments. The less significant these financial constraints, the lower the level of cash holdings firms hold. But companies in developed countries accumulate cash in anticipation of future greater investments (Pinkowitz et al., 2016). They seem not to consider liquidity constraints in their cash management policy. Furthermore, European firms cash policy seems to be independent from financial constraints (Paul and Fernando, 2010; in Azmat and Iqbal, 2017).

Risk aversion/reduction hypothesis

The risk aversion hypothesis links the level of cash holdings to the managerial entrenchment in the form of inside debt. Its conclusions are close to those of the flexibility hypothesis by Jensen (1986), but the starting point is different. Its origin is in Jensen and Meckling (1976). They suggested that debt-like compensation could be used to balance managers' equity-like compensation. Stock, options, etc., create an incentive to management to undertake extremely risky projects.

Inside debt is corporate debt provided by management. It can assume the form of pensions and deferred compensation (Liu et al., 2014). It has the advantage of aligning the interests of managers and debt holders. This in turn reduces the cost of debt for companies (potential bondholders are less worried of stockholders' interests). Management becomes more cautious and cash holdings increase. Excess cash is retained, damaging shareholders. Firms accumulate too many liquid assets because they reduce volatility.

The value destruction is greater in highly leveraged firms and lower in financially constrained companies. Financial constraints limit the possibility to accumulate excess cash. The relation between inside debt and cash holdings becomes negative as the corporate leverage approaches high levels¹⁰.

Inside debt is a bigger share of executives' compensation in firms with weaker corporate governance. However, the empirical evidence is not straightforward. Li and Zhao (2017) found no relation between inside debt and cash holdings when examining U.K. companies instead of U.S. firms¹¹. Inside debt is not used to reduce risks but to lower the personal income tax rate of managers.

Hedging perspective

Acharya et al. (2007) pointed out that cash is accumulated by businesses to have enough resources available when needed for investments if financing costs and limitation exist. They concluded that cash holdings are used to hedge risks. The effect of cash is different from external hedging. Derivative contracts reduce cash flow volatility by moving resources from the good to the bad state of the world. Cash holdings increase cash in every future state of the world. To a certain extent hedging policies can reduce the need of hoarding cash (Han and Qiu, 2007).

If an enterprise has (theoretical) unlimited access to capital market, the use of cash has no impact on the firm's value. It is indifferent to reduce debt or accumulate cash. The company can finance future investments with future external financing if needed. However, financially unconstrained firms tend to use excess cash to reduce debt due to other factors (e.g. lower yield on cash and short-term investments in comparison to interest rate paid on debt, appropriation of free cash flows by managers for personal objectives).

¹⁰ This fact could suggest that managers are more worried about the firm's survival in highly leveraged companies. The management will not receive the deferred compensation if the company goes into bankruptcy. Managers have incentive to reduce risks, and try to maximize the value of every corporate assets, cash included. Excess cash is minimized. Alternatively, Liu et al. (2014, p. 12) noted that the evidence "*could simply reflect the inability of firms with very high leverage to build cash reserves*".

¹¹ Nearly all studies in this relatively new branch of research focus on large U.S. firms. As far as I can tell, only Li and Zhao investigated businesses from a different country. They obtained results which are contrary to all the previous papers.

They gave two possible explanations: 1) in U.K. top managers can sometimes withdraw early their pension, before retirement age, but at the cost of a significant taxation; 2) in U.K. CEOs are allowed to transfer their pension to a different pension scheme. Through an independent pension scheme, CEOs' pensions are no longer exposed to the default risk of the company in which they work.

This suggests that the conclusions reached in the literature may be simply due to U.S. pension regulations. More evidence from around the world is needed.

Financing frictions make the cash policy value-enhancing. Companies hedge the risk of uncorrelation between operating cash flow and investment possibilities. Firms with reduced access to capital markets and/or bank lending prefer to:

- a) hoard excess cash flow (cash flow not needed for capex and opex) if their hedging needs are low; or
- b) use excess cash flow to reduce debt (or decrease future securities issues) if their hedging needs are high.

The corporate world is not indifferent between greater cash reserves and a lower debt if the access to external sources of financing is constrained. Cash holdings are used to keep a specific level of investments over time. The determinants of cash holdings are cash flow generation, sales growth rate and the correlation between them (Weidemann, 2017).

Spending hypothesis

The spending hypothesis argues the opposite of the free cash flow theory. Weakly controlled managers take actions to maximize their own wealth (Jensen and Meckling, 1976). They could prefer to invest immediately instead of accumulating cash for future investments. The reason is that managers also invest their human capital in the firm, but “*no contract can assure the entrepreneur’s [or manager’s] participation and effort, and there is no way to verify whether cash flow is appropriately distributed or reinvested*” (Myers, 2003, p. 38). Managers have an incentive to expand the firm to increase their reputation. If cash is accumulated they will engage in activities which quickly reduce the cash holdings. Acquisitions affect part of cash holdings (Bacchetta et al., 2014).

Managers may be willing to overinvest in the short term if they’re not willing to stick with the company in the medium-long term. By this point of view, large cash holdings can be considered a result of external controls on managers. If a firm is poorly governed, lower cash reserves can be explained in management’s decision to spend all cash as soon as possible, undervaluing the future flexibility that hoarding cash allows. Ceteris paribus, a firm with strong external control will hold more cash than a firm with weak external control (Harford et al., 2008). Both monetary (personal benefit from the company’s assets, keeping one own’s hierarchical position) and non-monetary elements (self-conceit, reputation) explain why managers may be willing to pursue value-destroying projects. Determinants of cash holdings are: investment level in fixed and intangible assets, growth rate, availability of investment opportunities (Weidemann, 2017).

Defense against hostile takeovers hypothesis

The defense against hostile takeovers is a combination of the free cash flow theory and spending hypothesis. Corporate governance is considered the trigger of cash holdings (Weidemann, 2017).

Managers are assumed to act on their own interest (Dittmar et al., 2003), not maximizing shareholders' wealth. This discretion attracts hostile bidders who believe they could be better owners of the firms. In response, managers accumulate cash to be protected in case of a hostile takeover.

Falaye (2004) argued that excess cash has the value of enabling firms with several anti-takeover mechanisms (share repurchases, reverse bid, acquisition of a bidder's competitor to force the antitrust authorities to block the hostile takeover, etc.) without having to rely on capital markets to gather funds. By the shareholders' point of view, high cash holdings are a double-edged sword: they increase the probability of a firm engaging in unfavorable acquisitions (Harford et al., 2008).

Opler et al. (1999) identified four key situations, related to anti-takeover mechanisms, which push firms to hold excess cash:

- 1) Highly dispersed shareholders base (excess cash makes the acquisition harder for a hostile bidder).
- 2) Significant total assets (the size is a takeover deterrent; see also Harford et al., 2008).
- 3) Low debt (firms are less monitored by the market).
- 4) Anti-hostile takeovers charter amendments.

However, large cash holdings also increase the benefit that associated with a successful hostile takeover. The target's liquid assets can be used to finance the operation (e.g. leveraged buy-out). The defense against hostile takeover hypothesis can explain why a significant empirical evidence points out that cash rich firms are not likely to be acquired. It opposes the flexibility hypothesis, which states that undistributed excess cash attracts bidders (Jensen, 1986). The market doesn't restraint sufficiently companies with too much cash (Falaye, 2004).

Shareholder power/financial contracting hypothesis and alignment hypothesis

The shareholder power hypothesis mixes the free cash flow theory and the pecking order model. It considers the underinvestment risk as the main driver of cash holdings, like the free cash flow theory. But it also affirms that companies prefer to rely on internal financing to fund investments, as predicted by the pecking order model.

Managers should follow policies which favor equity holders at the expense of creditors (Liu et al. 2014), since they're appointed by stockholders. Firms in which shareholders strictly control the management accumulate cash. Cash holdings constitute a tool to counter possible future external financing restrictions. Shareholders allow the accumulation of cash: their objective is to not let go any value creating investment opportunity (Harford et al., 2008). Furthermore, Falaye (2004) pointed out that corporate governance systems limit the extent to which management can invest in value destroying activities.

Meyr and Majluf (1984) highlighted that shareholders face a trade-off when determining how much cash the company should hold. The information asymmetry between shareholders and managers is a source of inefficiency, because it can lead to underinvestment. A negative relationship between agency problems and level of cash holdings exist. It's the strong shareholders' control on managers which leads to bigger cash reserves. For comparison, the free cash flow theory affirms that it's the weak control of shareholders on management the cause of the stockpiling of cash (Harford et al., 2008) - the opposite.

This theory is also called alignment hypothesis. But the alignment hypothesis slightly differs from the proper shareholder power/financial contracting hypothesis. Both theories predict that the quality of corporate governance is a fundamental determinant of cash holdings (Weidemann, 2017): the better the corporate governance structure, the higher the cash holdings. The alignment hypothesis suggests that the alignment of interests between managers and shareholders should be reached through specific corporate governance mechanisms and equity compensation (Liu and Mauer, 2011). The shareholder hypothesis is further-reaching and considers also law and regulations as protective devices for shareholders.

Costly contracting hypothesis

Liu and Mauer (2011) affirmed that risk incentives used to solve the agency conflicts between managers and shareholders directly influence the level of cash holdings. The explanation can be threefold:

- 1) Shareholders grants incentive based compensation to the management. But they also impose higher cash holdings to counter their inability to properly control managers due to an inefficient corporate governance structure (the alignment hypothesis).
- 2) Firms want to hold more cash to reduce the cost of debt, which is greater for riskier businesses. Excess cash is accumulated to avoid future liquidity shortfalls (costly external finance hypothesis; the general precautionary motive - see chapter 2.2).
- 3) Creditors are aware that similar incentives lead firms to engage in high risk projects and require more cash holdings as an insurance against bankruptcy (costly contracting hypothesis).

They found strong empirical evidence for the costly contracting hypothesis. The precautionary motive explains cash holdings only in financially constrained firms (in line with both the constrained liquidity theory and the hedging perspective). The costly contracting hypothesis is corroborated also by the positive relation between the vega component of a CEO's compensation (compensation incentive linked to the stock return volatility) and the probability of liquidity covenants in new bank loans. Risky firms may however sidestep liquidity covenants by voluntarily holding excess cash to obtain external financing at better conditions and without costly liquidity covenants. In either case the final effect is more cash.

Feng and Rao (2015) suggested an alternative explanation. They found the same positive vega-cash holdings relationship. The effect is stronger for firms with more risk averse management. The authors concluded that the increase in cash holdings isn't driven only by creditors' requests. Risk incentives push managers to take on riskier project, but they mitigate the higher risk by hoarding cash to reduce their exposure to companies' undiversified risk. The costly contracting hypothesis alone could only explain a portion of cash holdings.

Liu and Mauer (2011) costly contracting hypothesis' predictions are in line with the pecking order theory. But in the pecking order theory a marginal unit of cash has a positive impact in terms of shareholders' wealth (firms avoid expensive external financing and under-investments; Weidemann, 2017). In the costly contracting theory, instead, cash value decreases as cash holdings increase: excess cash imposed by debtholders for their own benefits cannot be invested, limiting growth opportunities.

3) *Other theories*

The literature has introduced further elements which can play a role on the level of cash holdings. These factors cannot be fully contextualized by the established cash holdings' theories.

Diversification hypothesis

The diversification hypothesis puts the focus on the uncertainty of the *correlation* between cash flows and investment opportunities (Duchin, 2010). Diversification could be a key element in the level of cash holdings. It can work as an insurance mechanism.

According to Jensen (1986), managers of high cash flow companies in declining industries diversify in order to use the proceeds from the company activity. They do not to pay out shareholders to avoid losing power, which is normally associated with the enterprise's size. On the contrary, Fernandes and Gonenc (2016) found that multinational firms efficiently plan their cash holdings. Cash holdings are inversely proportional to the amount of foreign sales and are distributed as per the geographic areas and types of business of the operations.

The more a company is diversified, the less cash it holds (Duchin, 2010). It can sell substantial non-core assets. Diversified companies have generally less firm-specific assets (Opler et al., 1999). They also have more investment opportunities (Wu et al, 2016).

Cash is usually transferred among subsidiaries by multinational (Tsamenyi and Skliarova, 2005) and diversified (Duchin, 2010) firms. Similar company enjoy economies of scale in cash management (Fernandes and Gonenc, 2016). They can transfer funds from low-productivity to high productivity divisions, needing less precautionary cash holdings. Cash holdings increase in industry which experience a surge of cash flow volatility (Bates and al., 2009). The industry diversification becomes less relevant in determining cash holdings once a company is already geographically diversified. Geographically diversified firms show a different cash holdings attitude (compared to non-diversified peers) only if foreign sales are significant (Wu et al., 2016).

The relationship among cash and diversification is greater in high GDP growth countries and lower in countries with stronger investor protection (Fernandes and Gonenc, 2016). A possible explanation is that companies in growing countries accumulate funds to finance the entry in foreign markets. They increase investments to reduce risks when expanding abroad. Firms with high sales growth invest more (Wu et al., 2016). Highly competitive markets weaken the insurance effects of diversification, thus leading to higher cash holdings.

Companies need to accumulate internal resources to be able to better cope with competition (Atanasova et al., 2015). This hypothesis is in accordance with two other theories:

- The shareholder power hypothesis: the inverse correlation between diversification and cash holdings is stronger in well managed firms. Well managed firms tend to be better at lowering their cash needs through diversification (ibidem).
- The constrained liquidity theory: the effect of diversification on cash reserves is greater in financially constrained companies (Duchin, 2010).

Its implications are inconsistent with the free cash flow theory. Harford et al. (2008) affirmed that cash rich firms are more likely to engage in acquisitions, even if value-destroying (e.g. an unsuccessful attempt of unrelated diversification). The diversification hypothesis instead predicts that companies with less cash should be more diversified.

Culture/institutions¹² hypothesis

National culture can influence the level of cash holdings. The more a society is individualistic (a la Hofstede), the lower the weaker the relationship among the level of cash and the diversification of its firms. Managers enlarge the investment programs (Chen et al., 2015).

The corporate governance structure alone cannot explain the level of cash holdings.

Companies in individualistic countries hold less cash because they are more likely to use excess cash to increase capex, acquisitions or share repurchases. Managers in individualistic societies are more positive on the amount of future earnings and consider their enterprise to be undervalued. Instead, firms in risk averse (“*high uncertainty avoidance*”) cultures accumulate cash to avoid shortfalls in the future. Managers in collectivistic countries want to preserve the company’s public image. High cash holdings signal a well-managed firm in these circumstances. Orlova et al. (2017) stressed that it’s the management’s culture (and not investors’ culture) that matters. The financial decisions on liquidity taken by managers are affected by the managers’ cultural bias and are not value maximizing for stockholders.

It’s hard to isolate the importance of culture on corporate cash holdings. The whole macro environment of a country can play a significant role in terms of cash reserves (Tahir et al., 2016). Companies of different countries could simply have different liquidity needs – U.S.

¹² One could argue that the quality of institutions is highly correlated with a country’s culture. Political institutions have historically been used as instrumental variables for culture in the literature (see, for example, Tabellini G., 2010. Culture and institutions: economic development in the regions of Europe. *Journal of the European Economic Association*, 8(4), 677-716). Gorodnichenko and Roland (2016, Culture, institutions and the wealth of nations. *Review of Economics and Statistics*, 0), among others, found evidence of a two-way causality between culture and institutions. Therefore, it’s difficult to say what supposedly influences more the level of cash holdings: culture or institutions?

and Chinese enterprises do (Wu et al., 2016) - and cash management practices (Tsamenyi and Skliarova, 2005), for example due to an inefficient banking sector (Ghazounai, 2013).

Laws and governments, not culture per se¹¹, could also influence the level of cash holdings. Pinkowitz et al. (2016, p. 4) noted that “*cash holdings can differ across countries because differences in institutions cause differences firm characteristics*”. Investors protection, corporate governance forms and bankruptcy law could be extremely relevant (Ferreira and Vilela, 2014).

On one hand, an efficient system allows firms to keep more cash, as the expropriation risk is minimized and the corporate insiders sustain greater cost to extract private benefits from the company they control. On the other hand, high quality institutions may reduce financial constraints, allowing businesses to decrease the cash they hold. Chen et al. (2014) found that good local governments¹³ in China are associated with lower levels of cash holdings¹⁴. Their results seem to contradict the later Pinkowitz et al. (2016) finding that country characteristics have little explanatory power on corporate cash holdings worldwide.

Product market competition hypothesis

A company loses market share if it isn't capable of taking advantage of all investment opportunities. The risk of underinvestment leading to a loss of market share is called predatory risk. It is higher for firms whose investment opportunities are highly correlated with the ones of their competitors (e.g. businesses operating in highly technological environments).

Haushalter et al. (2007) found that enterprises hedge the predation risk by keeping a higher cash balance. The correlation is stronger in industries with larger growth opportunities. Cash holdings are a prime determinant of investment decisions. They have two main benefits. First, they allow firms to perform the planned investments to reduce predation by cash rich competitors. Second, large treasuries give the possibility to increase investments in during adverse economic cycles and not lose ground compared to deep pocketed rivals which increase their market share by investing more when the economy is receding. Moreover, Haushalter et al. (2007) found that cash holdings are substitute to derivative instruments in the

¹³ A good government is defined as one that “*protects property rights, keeps regulations and taxes light, is clean, and provides efficient public services*”, without considering “*democracy and political rights*” (Chen et al., 2014, p. 4, note 1).

¹⁴ Chen et al. (2014, p. 25) warned that “*this only speaks of the dominating effect of a good government perceived by corporate insiders and we cannot rule out the possibility of government expropriation that might coexist and exert an opposite influence on firms' cash holding decisions*”.

context of product market competition. Companies which hold more cash have less derivatives in their balance sheets, and vice versa.

Fresard (2010) highlighted how larger cash holdings are associated with market share gains in subsequent years, especially if competitors face financial constraints and have correlated investment opportunities. Additionally, cash holdings constitute a barrier to entry, reducing intra-industry competition. The deterrents embodied by cash holdings leads to lower investment rates in industries with cash rich players. Cash has a positive effect not per se, but thanks to the pre-emptive effect.

The product market competition hypothesis is close to the hedging perspective (Acharya et al., 2007). But it highlights a strategic, not financial, rationale for cash holdings.

Life cycle hypothesis

Dittmar and Duchin (2010) studied the dynamics of corporate cash over a 50-year period, using firm age (years since IPO) as a measure of the corporate life cycle. They found that firms adjust their level of cash towards a target cash ratio. The speed of adjustment is very low and varies noticeably across companies due to adjustment costs. The adjustment costs are higher the farther the cash holdings are from the target level. A stronger corporate governance and easier access to finance (bank credit lines, equity issues...) reduce the adjustment costs, thus increasing the speed of adjustment. Businesses hoard cash before large investments. Successively their cash balances drop towards their target. Cash holdings below the target instead adjust slower. Furthermore, the speed of adjustment exhibits a U-shaped relationship with free cash flow: treasuries adjust slower in enterprises with very high/low free cash flow.

Overall, these conclusions seem to confirm the trade-off theory. But interestingly, Dittmar and Duchin (2010) found no support of a target capital structure: decisions on cash holdings appear to be distinct from leverage choices.

Drobotz et al. (2015) also found a substantial variation of cash holdings across time. They argued that the level of cash is strongly influenced by the current strategy of a company. Young firms with high growth opportunities and post-maturity firms hold a lot of cash, the former likely to take advantages of all investment opportunities, the latter probably due to agency problems. Cash holdings are at their minimum when moving towards maturity. Chen

et al. (2015) found that younger firms hoard more cash than mature ones. In general, large modifications of cash holdings are close to a transition between stages of the life cycle¹⁵.

The variation in cash holdings is a result of the variation of the demand function for cash. Thus, differently from Dittmar and Duchin (2010), Drobetz et al. (2015) found that target cash, its determinants and the speed of adjustments vary across life cycle phases. There is not a single cash target, but multiple cash holdings targets are associated to different periods of a company life. The cash target increases when moving from introduction to decline. But if a company want to reinvent itself and move back to an earlier stage (e.g. enters in a completely new market), cash is used and cash holdings decrease.

The life cycle hypothesis has the virtue of showing how different theories (for example trade-off and pecking order) can concurrently explain the level of cash holdings. But it is exposed to causality concerns (*“we do not know whether strategic decisions drive financing decisions and vice versa. In the end, it seems not unlikely that both are determined contemporaneously”*; Drobetz et al., 2015, p. 4).

Customer relationship hypothesis

The customer relationship hypothesis applicable mainly to business to business firms.

If one or a few customers account for a large share of revenue, it is likely that companies hoard cash as an insurance mechanism. Every buyer accounting for more than 10% of total sales is an important customer. Firms with important relationships hold on average more cash than similar businesses without important relationships. The level of cash holdings increases proportionally when there are important relationships with customers (Itzkowitz, 2013). The purpose of cash holdings is to assure a stock of resources sufficient to keep the corporation alive even if the important customer is lost. For this reason, enterprises whose main customers can substantially alter their going concern accumulate cash by recurring primarily to new equity issues, extracting more cash flows or from reducing capex (Bae et Wang, 2015). Increasing leverage creates reinforce the risk of extremely negative consequences if important customers stop their purchases¹⁶. Additionally, lower leverage and higher cash holdings represent a commitment towards important customers (who fear the bankruptcy of their important suppliers). This commitment is detached from the precautionary motive for holding

¹⁵ Drobetz et al. (2015) used a 5 stages life cycle framework: introduction, growth, maturity, shake-out and decline.

¹⁶ Itzkowitz (2013) did not highlight this point in her paper. She only discussed the commitment motivation.

cash. It seems that the commitment motivation does not extend to buyers: important customers may be required to keep more cash to signal financial health, but the empirical evidence is against this argument (Itzkowitz, 2013).

Overall, the need to safeguard the relationship-specific investments is the main driver of the increase in cash holdings. Without the hedge provided by cash, an external shock may break the relationship and make all idiosyncratic investments worthless. Selling to alternative customers could be difficult. The increase in cash holdings in case of important relationships is stronger if relevant relationship-specific investments were incurred (Bae et Wang, 2015). The liquidation value of idiosyncratic assets is lower, so firms accumulate cash to reduce the risk of sustaining distress costs. The customer relationship hypothesis is verified only for nongovernment customers. Government customers are generally not profit oriented and are not worried of suppliers' liquidity shortage. They may also purchase from distressed suppliers to save jobs.

The customer relationship hypothesis is compatible with the diversification hypothesis. It could be argued that it is an extension of the diversification hypothesis. However, the diversification hypothesis states that the more a company is diversified the less cash it will held. It doesn't explicitly affirm that undiversified firms hoard lots of cash. The "starting" level of cash holdings is unspecified in the diversification hypothesis. The customer relationship hypothesis agrees with some dynamic trade-off models (for example, Bolton et al., 2013) and the hedging perspective (Acharya et al., 2007) on separating the value of cash and debt. Cash is something else from negative debt (Itzkowitz, 2013).

Research and development smoothing hypothesis

Several studies have found a relationship between R&D expenditures and cash holdings (Opler et al., 1999; Bates et al. 2009). Pinkowitz et al. (2016) argued that high R&D expenses can justify U.S. firms foreign cash holdings more than the tax motive supposed by Foley et al. (2007)¹⁷. The R&D smoothing hypothesis moves beyond similar publications because R&D is used as the main explanatory variable of cash reserves. R&D is one of the most significant corporate expense. Adjusting R&D activities according to the current financial results is too costly and not efficient. R&D projects can require many years to be completed. Stopping promising R&D projects due to financial constraints may be the cause of competitive disadvantage compared to cash rich rivals. Laying off R&D workers may lead to the

¹⁷ See chapter 2.2.

dissemination of sensitive information. Substitute highly specialized workers may be not available when needed or new recruitments could impose significant training costs.

Firms which are more exposed to financial shocks accumulate cash to avoid any interruptions of their R&D projects. Young firms constantly use their cash holdings to smooth R&D expenditures. Companies which are more robust to external financial shocks instead do not hoard cash to fund R&D: they rely on volatile sources of finance (free cash flow and new stock issues), given that accumulating cash is costly (Brown and Petersen, 2011). The importance of cash holdings as a buffer for R&D has increase in the last decades, during which the R&D intensity of many industries upsurged. Firms not reporting R&D do not exhibit higher cash holdings than the past.

Kim and Shin (2011) provided a more in-depth insight on the phenomenon. Young firms tend to use cash holdings to smooth R&D during a bear market, not during a bull market, as already predicted by the market timing theory. Cash is accumulated during bull markets when it is cheap. Successively, it is used when external sources of finance are costly or not easily accessible. Funding R&D investments through capital markets is susceptible to moral hazard and adverse selection. Drawing down cash reserves is a way to avoid information asymmetry costs. Moreover, companies use more cash holdings to smooth capitalized R&D expenses than expensed R&D costs. The reason is probably that the capitalized R&D has a greater value generation potential.

The R&D smoothing hypothesis is akin to other theories (constrained liquidity theories, hedging perspective, ...). But it “*directly examine [sic] the use of cash holdings for investment smoothing rather than the propensity with which firms invest their cash flows in precautionary cash stocks*” (Brown and Petersen, 2011, p.4).

2.2 ACCUMULATION OF CASH HOLDINGS

The academic literature has found four main reasons¹⁸ which lead enterprises to accumulate cash (Bates and al., 2009): the transaction motive, the precautionary motive, the tax motive and the agency motive.

These 4 motives are found throughout the various financial theories related to cash holdings. They do not constitute stand-alone “theories” of financial decisions. They explain why companies would accumulate cash and what would be the consequences¹⁹.

Transaction motive

Firms keep cash to reduce transaction costs. Companies incur transaction costs when using external forms of financing. External sources of liquidity can be both traditional (credit lines, bonds, equity) and alternative - trade credits, trade receivables to customers, late wage payments (Bacchetta et al. 2014). Hoarding²⁰ cash allows companies not to liquidate assets and to minimize transaction costs (Keynes, 1936). Riskier businesses with more investment opportunities should hold more cash.

Miller and Orr (1966) “inventory” model reveals that the pattern of cash holdings is irregular and unpredictable due to cash flow volatility²¹ if firms follow an optimal cash management strategy. Companies try to minimize the long-term cash management costs. The model assumes that firms can transfer resources from their cash account to an interest-bearing account at any time incurring in transaction costs. When cash holdings approximate a specific (high) level, companies invest more or reduce debt. If the level of cash holdings is excessively low for too long, firms will disinvest to replenish the cash reserves.

Economies of scale in cash management exist. Adão and Silva (2017, p. 9) noted that:

“If there was no benefit of maintaining cash, firms would choose a cash-sales ratio approximately equal to zero, as holding cash implies an opportunity cost in interest foregone. As the cash-sales ratio [how much cash a company holds in respect to the sales flows] is sizeable in economic terms, the data indicate the existence of costs in the management of

¹⁸ Keynes (1936) identified a further motive: the speculative motive. See the market timing theory in chapter 2.1.

¹⁹ I found the difference between “motives” and “theories”, in many cases, slight. Nevertheless, to the best of my knowledge, in the scientific literature, these 4 motives have rarely been presented as general theories. This presentation will stick to the accepted mindset.

²⁰ To be precise, Keynes wrote of “*liquidity-preference*”. But he also highlighted (1936, p. 110) that “*the concept of hoarding may be regarded as a first approximation to the concept of liquidity-preference*”.

²¹ Miller and Orr (1966) considered total sales. They modelled cash flow as a random variable.

money. These costs may be in the form of transaction costs or in the form of management costs.”

Firms compare costs and benefits of hoarding cash to determine their level of cash. There are two types of costs to consider: the proper marginal costs of cash (i.e. the lower interests earned) and the marginal cost of cash shortage (the cost incurred in having to reduce investments and/or dividends). The former is constant²² at all level of cash holdings, the latter increases for greater liquidity shortages - a firm raises additional outside funds or reduces investments more (Opler et al., 1999).

Hoarding cash is more expensive the higher the tax rate. Interest income from liquidity is subject to double taxation (at the corporate level and at the shareholders’ personal income level). Cash holdings as a percentage of total assets should decrease as firm’s size increases. Transaction costs decreases for large firms thanks to economies of scale. Cash holdings are considered inversely proportional to asset size (Bates et al., 2009). Companies generating high cash flow can accumulate cash quickly, but they can also have lower cash holdings. They can replenish their cash reserves in a short period if needed (Pinkowitz et al. 2016).

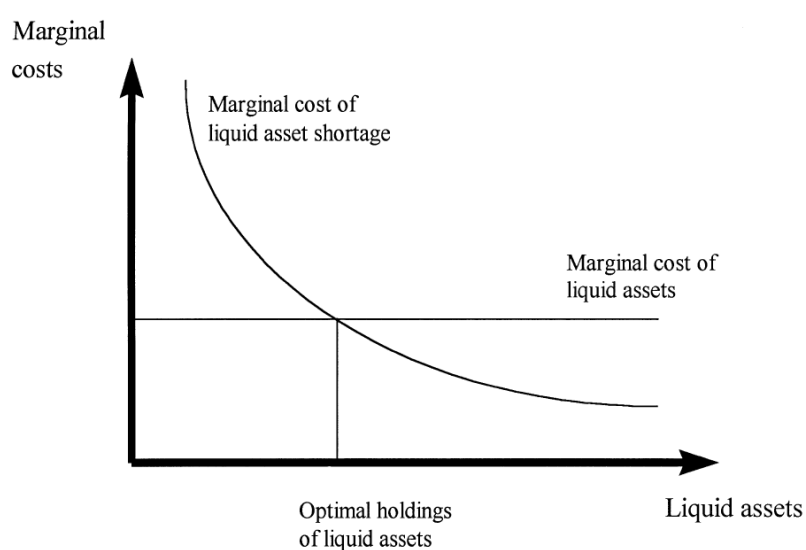


Figure 2: The optimal level of cash holdings is achieved when the marginal cost of liquidity equals the marginal cost of a liquid asset shortage, i.e. when the marginal profit is zero.

Source: Opler et al., 1999.

²² As Opler et al. (1999) noted, the opportunity cost of liquid assets increases with interest rates. The marginal cost of cash is constant for every amount of cash holdings all other things being equal, i.e. at the same level of interest rate.

Precautionary motive

Investments generate a return after a period. Meanwhile, if companies need liquidity, they could suffer a loss to obtain new liquid assets. Firms can hoard cash and use it if other sources of financing aren't available or are too costly (Keynes 1936). They accumulate cash to take advantage of all investment opportunities that arise (Fernandes and Gonenc, 2016).

Companies with better investment opportunities should hold more cash: cash flow reduction or financial distress are costlier for them. Cash is used as a protective buffer (Bates et al., 2009) and as a self-insurance scheme (Boileau and Moyen, 2010).

Opler et al. (1999) noted higher cash holdings in firms with more volatile cash flow and reduced access to external funding. Companies with an easier access to finance generally have a smaller treasury. Credit rating plays a role in determining the level of cash (Ferreira and Vilela, 2004). Cash holdings are a function of the availability of external financing. Cash is a substitute of credit lines (Bacchetta et al.²³, 2014).

The precautionary motive to hold liquid assets is related to information asymmetries existing between companies and the environment and to the agency costs of debt. Investors discount securities in consideration of the supposed information asymmetry. By the management point of view, such discount can be so large to undervalue a security.

Agency costs of debt arise when the interests of stockholder and bondholders are not aligned. They can also occur in case of disagreement among various creditors. Agency costs of debt make difficult for highly leveraged companies to raise additional debt if needed. A method commonly used to counteract this weakness is interrupting the distribution of dividends to build cash reserves, reducing net debt (but not nominal debt; see Bates and al., 2009).

The predictions made by the precautionary motive are in line with those of the transactions motive, but provide “*an explicit reason why outside funds would be expensive*” (Opler et al., 1999, p.8). Cash holdings allows companies not to pass up on profitable investments in case of high external financing costs (Myers and Majluf, 1984). Higher research and development expenditures are associated with higher cash holdings. Firms seem to be more worried about

²³ Bacchetta et al. (2014) used the cash ratio (cash/total assets), not the level of cash holdings, in their model. However, they also highlighted (2014, p. 19-20) that, referring to a productivity shock, “*one of the effects of this decline is to decrease the amount of external liquid funds available at end-of-period. This effect... implies an increase in both the cash ratio and – to a lesser extent – the cash level*”. They divided a liquidity shock in two components: the portfolio effect (as liquidity decreases, firms adjust their portfolio to increase the cash ratio) and the size effect (when financing conditions worsen, firms should reduce their size). These two effects affect the liquidity in opposite ways. The portfolio effect dominates the size effect, so that the level of cash holdings increases in response to a liquidity shock.

not passing up future projects than present needs. Higher capital expenditures are linked to lower cash holdings, contrary to R&D expenses (Bates et al., 2009).

For this reason, listed companies can hold less cash. However, they can also have more cash holdings from new equity issues (Fernandes and Gonenc, 2016). Ferreira and Vilela (2004) argued that firms in countries with high level of investors protection hold less cash. Pinkowitz et al. (2016) found evidence supporting the idea that firms in developed countries have smaller cash balances. Chen et al. (2015) found that the precautionary motive for holding cash is stronger in risk averse cultures. Also, businesses with higher managerial agency costs are expected to hold more cash (Opler et al., 1999).

Firms that can make in the best available investments²⁴ in the present and in the future (i.e. financially unconstrained firms) have no precautionary motive for cash holdings. They can swap financing policy without any impact in value (Han and Qiu, 2007). Faulkender et. al (2017) argued that the precautionary motive can explain the level of domestic cash holdings of U.S. multinational firms, but not the cash holdings held abroad. Foley et al. (2007) also found that the precautionary motive is incapable of explaining why U.S. companies hold so much cash in foreign jurisdictions, given that they incur most of their research and development costs at home.

Boileau and Moyon (2010) disentangled the ways through which risk can affect the level of cash holdings:

- The precautionary motive: when risk intensifies, firms increase savings to be protected against future shocks.
- The liquidity motive (an enlarged transaction motive): when risk grows, firms hoard more cash because it becomes less expensive to meet their current year liquidity needs by doing so instead of modifying other financial policies (investment rate, dividend payout, capital raising through debt and equity). Internal funds are cheaper as they do not trigger transaction costs.

They found that the increase in cash holdings in the U.S. since the '70s is attributable mostly to the liquidity motive. The precautionary motive has lost relevance over time.

²⁴ The best available investments are determined at the point in which the marginal cost of debt is equal to the expected marginal return of the projects.

Azmat and Iqbal (2017) affirmed that, differently from the transaction motive, the precautionary motive has not been investigated sufficiently in the literature. Thus, more empirical evidence is needed.

In any case, the precautionary motive originated several theories on cash holdings: hedging perspective (Bates et al., 2009), diversification hypothesis, life cycle hypothesis²⁵, customer relationship hypothesis...

Tax motive

The tax motive for holding cash has been applied to explain the large cash holdings of U.S. multinational firms. It has been proposed by Foley et al. (2007).

U.S. multinational companies have more cash because they don't repatriate the subsidiaries' funds. Repatriating cash is inefficient by a tax point of view. Foreign income is taxed domestically for an amount equal to the difference between foreign income taxes paid and taxes that the corporation would have paid if that income was generated in the country of origin. In the U.S, a company is obliged to pay those taxes if it wants to move foreign earnings to its domestic country. Foreign taxes on income grant tax credits²⁶ to shield repatriation taxes.

Firms subject to higher repatriation costs have greater cash holdings. They keep cash abroad to avoid taxes on foreign income repatriation. Those taxes are deferred until foreign earnings are effectively repatriated. Among foreign subsidiaries, more cash is retained in jurisdictions which would trigger higher repatriation costs. Foreign branches of multinational companies exhibit lower treasuries compared to foreign affiliates. The reason is that U.S. firms' foreign branches' earnings are taxed when earned, not when repatriated.

The source of abnormal cash holdings is the lack of investment opportunities abroad. A good chunk of foreign earnings is not reinvested but kept idle in the form of cash. Even if investment opportunities exist at home, earnings from low tax jurisdictions are usually better invested in those low tax countries due to tax savings.

²⁵ But Dittmar and Duchin (2010) found significant relations between cash holdings and cash flow and cash holdings and capital expenditure volatility only when adjustment costs towards the cash target are high (and not always, as postulated by the general precautionary motive).

²⁶ Tax credits relate to bilateral tax treaties among sovereign states, agreed to avoid double taxation. Nowadays, tax treaties exist among the vast majority of United Nations countries. The forms they can assume are varied, but the general concept behind Foley et al. (2007) paper still holds.

Firms characteristics play a big role in the amount of cash accumulated in foreign jurisdictions. Companies with high leverage and low credit rating have lower corporate cash holdings and usually do not hold too much cash abroad. They prefer to repatriate foreign earnings and use it as a form of internal financing. Companies operating in technology intensive industries are capable of shifting profits to low tax countries and pile up significant cash holdings in tax havens. In those industries, intangibles represent a significant portion of the balance sheets and they can easily be transferred within the multinational company²⁷. Moreover, transfer prices allow to move profit in low tax jurisdiction, leaving losses in high tax countries²⁸.

In their analysis, Foley et al. (2007) hypothesized 3 channels through which repatriation costs would not influence U.S. firms' cash holdings:

- 1) Firms invest more abroad instead of accumulating cash.
- 2) Firms hold less cash domestically to offset the greater cash balances abroad.
- 3) Firms transfer liquidity at home without triggering repatriation taxes (e.g. subsidiaries in low tax jurisdiction lending money or investing in the parent company).

The work found no evidence for the hypotheses. The explanation given is that these strategies are too costly or ineffective. Faulkender et. al (2017) argued that domestic and foreign cash cannot be considered perfect substitutes in the presence of repatriation taxes (explaining, at least partly, the second point). De Simone and Lester (2017) documented a negative relationship between foreign cash holdings and domestic liabilities. Repatriation taxes impede corporations to use optimally their internal capital markets to fund share repurchases (but firms with significant foreign cash do not need to use domestic financing for investments or operating purposes).

Bates et al. (2009) found no cash holdings' increase for U.S. multinational firms with taxable foreign income between 1990 and 2006. Pinkowitz et al. (2016) argued that tax policies alone cannot explain of the increase of U.S. multinationals' funds. Only a handful of firms in the right tail increases significantly the average cash holding.

²⁷ E.g. a sale from the parent company to a subsidiary while the asset is still under development; in this way taxes aren't paid domestically on a potentially profitable technology.

²⁸ The losses are successively used to offset taxes on income the years after. Transfer prices accepted by tax authorities around the world simulate an arm's length transaction in an open market between unrelated parties, but those values are still theoretical. The more an asset is firm-specific, the harder it is to determine its arm's length price.

They drew a comparison between U.S. multinational and similar foreign firms (“*twin companies*”). The cash holdings between comparable U.S. and non-U.S. corporation are on average very close. But the U.S. economy has some research and development intensive corporations²⁹, with no equal abroad, which hoard significant amounts of cash.

When repeating the analysis on only U.S. firms, the authors found the same pattern: a few high-level R&D expenditure companies skew the distribution to the right. Pinkowitz et al. (2016) concluded that the tax motive for holding cash has a limited capability of explaining the empirical evidence. Being or not a multinational (with the correlated possibility to perform foreign income fiscal optimization) does not modify the behavior of U.S. firms. It’s the level of R&D that is directly correlated to cash holdings³⁰, in accordance with the R&D smoothing hypothesis.

A subtle critic to Foley et al. (2007) findings can be found in Laplante and Nesbitt (2017): foreign cash is not a synonym of trapped cash. The former is cash held by foreign subsidiaries. The latter is cash and cash equivalents generated by foreign earnings and held by foreign subsidiaries to avoid repatriation taxes. Foreign cash obtained through capital and debt cannot be considered trapped cash. Even if firms disclose foreign subsidiaries’ cash holdings it’s hard to determine how much cash is trapped abroad due to the tax motive. Moreover, U.S. firms can effectively “repatriate” foreign cash free of tax in at least two ways³¹:

- 1) Short-term loans from a foreign subsidiary to the parent company (U.S. Internal Revenue Code Section 956) which if “*structured properly...can be sequenced to provide a source of long-term financing*” (ibidem, p.15).
- 2) Cash pooling arrangements: very short-term form of intercompany loans. A bank grants a loan to a company using as collateral cash that the firm holds in another country.

Furthermore, Laplante and Nesbitt (2017) found that companies with tax haven operations are less likely to have trapped cash. Multinational firms use tax havens not only for their low-tax jurisdictions, but also because they are offshore financial centers offering advanced services.

²⁹ The top-two deciles of R&D/sales.

³⁰ Beware that “*our results cannot be interpreted to mean that high-R&D U.S. firms hold more cash than high-R&D foreign firms do. There are too few high-R&D foreign firms to reach such a conclusion*” (Pinkowitz et al., 2016, p. 26).

³¹ Alternative ways to utilize trapped cash exist. For example, Apple has issued bonds to repay stockholders without repatriating foreign cash, relying on the excellent credit rating that its financial position (which includes consolidated foreign cash) warrants.

Agency motive

The relation among manager and shareholders, or among shareholders themselves, can greatly influence a company's cash holdings. The issue can extend also to other stakeholders, such as customers and employees (Werder, 2011; in Deb et al., 2017).

Managers can bargain or act illegally to take control of cash, reducing the company's value. They keep cash in the company to increase power and authority (Jensen, 1986). Managers can reduce the company dependence on the market by holding large amounts of cash. They can invest in projects with negative net present value that investors would not undertake (Opler et al., 1999).

Managerial agency costs are higher when the degree of protection of outside investors is low. Managers have an incentive to hoard cash to increase their power through the firm's investment policy. The level of cash holdings is lower the more protected shareholders' rights are (Dittmar et al., 2003) and the more developed the capital markets are (Ferreira and Vilela, 2004).

Excessive capital expenditures and acquisitions lead to lower profitability. Consequently, companies in which managers are subject to lower discipline also have lower valuations. Also, when distributing excess cash, managers of low shareholders' rights firms tend to repurchase share instead of increasing dividends. By minimizing their commitment to stockholders, managers ensure that they will have high discretion in the future. The cash balance can be used to counter weak corporate governance structures in firms (Liu et al., 2014). For example, family firms, particularly exposed to agency conflicts among members of the controlling family and minority shareholders, have higher cash holdings than non-family firms (Caprio et al., 2016).

Regarding multinational companies, cash holdings can enhance a subsidiary ability to develop and transfer knowledge to its headquarter. However, keeping income abroad can be cause of inefficiency in cash management and increase the risks connected to expropriation. A trade off exists. It is solved by means of "expatriate" CEO and directors in the subsidiaries (Beuselink and Du, 2017).

The precautionary motive can have a larger influence on cash holding than agency problems (Ferreira and Vilela, 2004; Bates et al., 2009). The problem with the agency motive for cash holdings is that it can predict both a positive and a negative association between cash holdings

and agency problems (Harford et al., 2008). The sign of the relation depends on managers' preference between current overinvestment and future flexibility.

Dittmar and Mahrt-Smith (2007) found that managers of weak corporate governance firms invest excess cash sooner than managers of firms with an effective corporate governance.

Harford et al. (2008) found that poorly governed U.S. firms hold less cash because managers over-invest. Managers compare the benefits of spending excess cash today (personal power) to its cost (reduced financial flexibility in the future). But differently from other agency motive analysis on cash holdings, the authors argued that managers prefer to invest today.

Bates et al. (2009) found that smaller U.S. firms experienced a greater cash holdings' increase in the 1990-2006 period. But larger firms are the ones more exposed to agency costs. The authors found that firms with entrenched managers do not show higher cash holdings. All these findings contradict some of the previous investigations on the matter.

The agency motive spawned several theories: free cash flow theory (Bates et al., 2009), spending hypothesis, defense against takeover hypothesis...

2.3 CORPORATE SOCIAL RESPONSIBILITY

The Corporate Social Responsibility (CSR) concept doesn't have a generally accepted definition (Mikołajek-Gocejna, 2016). Even worse, several variants of CSR definition conflict with each other (Wang, 2015). Even the CSR label isn't universally used. Alternative terms are: Corporate Social Performance (CSP), corporate conscience, corporate citizenship, triple bottom line/ people, planet, profit, stakeholder approach, sustainability, etc. (Watson, 2015). Some definitions do not perfectly overlap with each other (Montiel, 2008), generating additional confusion.

A frequently cited definition can be found in the European Commission Green Paper (2001, p.6), according to which CSR is *“a concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis”*.

A common trait of all definitions is that CSR is voluntary and goes beyond what is required by the law (Kasipillai and Rachagan, 2013). Nowadays, two types of CSR definition are common: the stakeholder definition and the social definition (Su and Jie, 2015). According to the former CSR is the firm's response to stakeholders' requests (Dastgir and Patrisia, 2017). The latter states that CSR is the set of actions taken by firms to improve social or environmental conditions (Mackey et al., 2007). Companies are deemed responsible also of the effects of the consumption (not only production) of the goods/services they sell, and thus are expected to integrate a specific CSR policy in their strategy (Chauhan, 2014).

CSR studies have been increasingly common in the literature (Cheng et al., 2014). Investors' interest in the topic increased after the 2007-2008 financial crisis (Cooper and Uzun, 2015). In recent years, the general public has put a lot of pressure on businesses to behave in a sustainable way by the economic, environment and social perspectives (Wiengarten et al., 2017). Companies are expected, not simply asked, to behave in a socially responsible way. They address CSR topics by using specific ESG (Environment, Society, Governance) frameworks which require sustainable development (Mikołajek-Gocejna, 2016). The CSR commitment can be taxing: sustainability standards and critical issues vary over time (Cooper and Uzun, 2015).

CSR has become so relevant that dedicating human resources (especially C-level executives) to social responsibility matters can greatly increase financial results thanks to its positive reputational effects (Wiengarten et al., 2017). Also, employees working performances improves in CSR minded businesses (Dumitrescu and Simionescu, 2015). Consequently,

every firm must address and properly face CSR concerns. The three most common CSR initiatives are sponsorship, cause related marketing and philanthropy (Pour et al., 2014).

Below, a very brief overlook³² of the historical development of the concept of CSR is given, with a focus on theories which have strongly resonated in the business community. The presentation of the link between CSR and financial performance follows. Afterwards, publications covering the effects of CSR on some elements of interest in this work (taxes, access to finance and legal systems) are reviewed.

HISTORICAL DEVELOPMENT

CSR has been since its inception a hotly debated topic (Kasipillai and Rachagan, 2013). Although ideas of social responsibility are as old as human civilization (Toma et al., 2011), the roots of modern CSR are dispersed between XVIII century's Enlightenment, XIX century Northern European Social Christian Paternalism (Doucin, 2011) and early XX century Anglo-Saxon publications (Ihlen, 2013). Generally, the origin of the academic CSR literature is attributed to a 1953 book, entitled "The Social Responsibilities of the Businessman", by Bowen (Carroll, 1999).

Early conceptualizations

A first coherent definition of CSR can be found in Bowen, 1953, p. 6: "*the obligation of businessmen to pursue those policies, to make those decisions, or to follow those lines of action which are desirable in terms of the objectives and values of our society*" (Carroll, 1999).

Corporations should stop looking only at the financial results, and consider a wider range of elements in their everyday business. Voluntary "*doctrine*" of social responsibility can solve many social issues, because firms are centers of power which can be used for the well-being of the members of the community.

However, companies alone cannot solve all problems. Dissatisfaction will arise when people realize that social issues are not prevented. Therefore, governments need to develop a set of principles to impose social responsibility to businessmen.

Bowen wrote his seminal book at the request of the Federal Council of the Churches of Christ in America. CSR was still a religious inspired idea. The aim of social responsibility was to

³² For a complete review until the end of the twentieth century, see Carroll (1999) and Toma et al. (2011).

comfort the conscience of “*a wealth minority living off the work of poor people*” (Doucin, 2011, p.5). According to this line of reasoning, CSR is a moral obligation. Doing the right thing is in itself a justification to engage in CSR activities (Kramer and Porter, 2006).

Bowen book caused an intense discussion (Ihlen, 2013). In the ‘60s the interest in CSR rose (Bosch-Badia et al., 2013). One of the academics who contributed more to the establishment of CSR was Davis (1960; 1967; 1973).

He remarked the voluntary trait of CSR. What is imposed by law cannot be considered socially responsible – this is simply good citizenship. CSR begins where the law ends. Legal compliance is not CSR. Davis also introduced the idea of the Iron Law of Responsibility: companies must engage in CSR because otherwise politics and society will scrutinize them and lead to a fall of capitalism (Davis, 1960). The common values in society have changed and corporate sustainability is required. CSR imposes companies to consider the effects of their choices on the entire society, not only on the main actors which are influenced by their activities, namely shareholders (Davis, 1967). These considerations represent the “*seeds of stakeholder theory*” (Freeman et al., 2011, p.237).

Another point of novelty in Davis’ arguments is that CSR is considered a risk-management method. It is not a religious concept. It’s in the interest of corporations to engage in CSR. A sustainable behavior ensures a firm’s survival and flourishing (Davis, 1973). Davis’ ideas were so influential that Carroll (1999, p. 4) wrote “*Davis’s [sic] contributions to early definitions of CSR were so significant that I would consider him to be the runner-up to Bowen for the Father of the CSR designation*”.

Definitions of CSR proliferated until the 1980s. The notion of utility maximization is relevant. It was one of the many CSR definitions developed in Harold Johnson’s 1971 book *Business in Contemporary Society: Framework and Issues* (Carroll, 1999). The main objective of a firm should be to maximize its utility function, as prescribed by the classical economic doctrine. But this utility function should comprise the well-being of not only shareholders, but also all members of the company and society. Enterprises should have multiple targets to reach, not only profit maximization.

However, the idea of CSR was not universally welcomed. Levitt (1958) described the rise of the concept as primarily a defensive measure used by corporations against the environment. Firms began to help where the government failed. CSR is a concept used to defend the capitalism system from political attacks. It’s “*talk*”. Businesses do not show off their profits, but their sustainability.

Managers of CSR firms haven't modified their personal values: CSR activities "*are not charity. They are the hardheaded tactics of survival against the onslaught of politicians and professional detractors. Moreover, they build morale, improve efficiency and yield returns in hard cash*" (ibidem, p.3). According to Levitt, CSR is positive only until it is performed to increase profitability. But real commitment to CSR, beyond a simple advertising tool, is negative. Organizations would quickly lose sight of their original goal: profit maximization. Even worse, they would assume not only obligations, but also the associated power. Firms would become arbiters of society.

This kind of criticism was also used by Friedman in an infamous 1970 New York Times article. He argued that, not being a person, a business has no responsibilities. Only shareholders and corporate executives are responsible. Managers engaging in CSR activities use stockholders' money for the benefits of someone else. But they are appointed as agents of shareholders. If shareholders want to spend their own money for the general interest, they can do it separately (and the same applies to employees and customers).

As Levitt (1958), Friedman warned from the political risk that CSR can bring: CSR negates the market economy. Scarce resources are allocated through a political process. Moreover, the management has no education to evaluate what is the best way to solve a social issue. Directors have a business background. They know only how to maximize shareholders' wealth. Thus, the only objective of a corporation can be profit maximization.

The so-called shareholder view of Friedman spawned numerous publications. Today some academics have highlighted that a profit-maximizing CSR level exists. In opposition to the view that CSR benefits always exceed CSR costs (Artiach et al., 2010), other researchers have argued that only some CSR activities (different from company to company) enhance profitability (Goering, 2010). According to this perspective, which directly descends from Levitt and Friedman's arguments, firms should engage exclusively in CSR activities which have positive effects on profits.

Business ethics

Business ethics helped to develop the concept of CSR, especially in the 1970s.

It is a specific subset of moral philosophy and ethics which ponder over ethical issues in business (Freeman et al, 2010). Not being properly part of the economic (management, accounting, finance, ...) literature, this stream of research will not be reviewed thoroughly in this work. However, it has deeply influenced, and has been influenced by, studies on CSR. At a glance, the notion of business ethics can be separated in three main branches (ibidem):

- 1) Constraint on self-interest: businessmen should limit their actions to what is socially accepted. Self-interest must be mitigated by ethical considerations to keep free market a trustable mechanism. Opportunistic behaviors are unacceptable and damages the whole economy by causing an inefficient transfer of resources. Ethics imposes restrictions beyond what is legally due on controversial issues (e.g. insider trading)
- 2) CSR or charity: the part of business ethics studies which consider CSR a supplementary, not integral, component of firms' obligations. Companies need a social justification to operate. Profits are morally tolerable only if balanced by corporate good acts which enhance corporate reputation. Firms are expected to engage in CSR even if this reduces shareholders' wealth
- 3) Rational for business: economics and ethics are not parallel, but intrinsically linked. Business activities are moral values in themselves. The market is an expression of freedom and a place for people to create value in the community. Even self-interest has a moral value.

Pyramid of Corporate Social Responsibility

It was only in the '70s and '80s that the concept of CSR moved beyond simple paternalism (Doucin, 2011), assuming a business oriented nature. New definitions of CSR shifted from social obligation to marketing function (Wang, 2015).

A milestone in the evolution of the CSR concept is the pyramid of CSR developed by Carroll (1979; 1991). The pyramid summarizes the various definitions of CSR developed by the end of the '70s, and as such, it is driven by the moral responsibility view (Wang, 2015). Carroll highlighted how CSR comprises four, not mutually exclusive, categories of responsibility:

- 1) Economic responsibilities: the most important responsibilities. Companies are required to produce goods and services to increase social welfare. The sale process must result in profit.
- 2) Legal responsibilities: organizations must obey the law. They can operate only if their activities do not break any regulations. It is the second most relevant category of responsibility.
- 3) Ethical responsibilities: the respect all moral norms above what law imposes on firms, but still required by society. Ethical requirements (as regulations) vary over time.
- 4) Discretionary (1979) or philanthropic (1991) responsibilities: all "responsibilities" that are entirely voluntary. They are not necessary to be economical, aren't required by law or by ethical criterions. The typical example is corporate charity.

The dimension which shows the greater volatility in performance is the ethical one. Managers can indeed be immoral (their behavior is opposed to moral norms), amoral (they do not care of the consequences that their actions may have on other, whether because they do not see the harm created or because they believe that ethical considerations should be kept in the private sphere) or moral (they want profitability, but respecting ethical issues).

The pyramid is flexible: social issues differ among industries. Therefore, every firm needs a specific level of social responsiveness to various problems. For each of the four categories of responsibility, a company may follow a reactive, defensive, accommodating or proactive stance.

The pyramid reconciled the broader definitions of CSR with the shareholder view. The economic sustainability is considered a fundamental element of CSR, not a dimension separated from the other three. Carroll (1991) also highlighted that even the fiercest supporters of the shareholder view, such as Friedman, already endorse the first three dimensions of the pyramid, and exclude only philanthropic responsibilities. Thus, the ideological contrast is more apparent than real.

Stakeholder theory

The stakeholder theory³³ can be attributed to Freeman and Reed (1983)³⁴. Even though its origin can be traced back to the early '60s, it received a determinant boost only decades later thanks to the Corporate Social responsibility concept. Supporters of the stakeholder theory view it as the natural evolution of the CSR and business ethics literature:

"While the corporate social responsibility literature was important in bringing to the foreground in organizational research a concern with social and political issues, it failed to indicate ways of integrating these concerns into the strategic systems of the corporation in a non-ad hoc fashion"- Freeman et al., 2010, p. 42.

"There is a natural fit between the idea of corporate social responsibility and an organization's stakeholders. The word "social" in CSR has always been vague and lacking in specific direction as to whom the corporation is responsible. The concept of stakeholder

³³ The Balanced Scorecard, the application of the stakeholder theory in the managerial literature, is not discussed because not of interest in the context of this work.

³⁴ The "father" of the stakeholder theory is generally considered Freeman alone thanks to his 1984 book "Strategic Management: A Stakeholder Approach". But the 1983 paper cited here and published in the Spring edition of the California Management Review predates the book's main ideas by a few months. Also, although not as influential as Freeman, Ian Mitroff's 1983 book "Stakeholders of the Organizational Mind" structured a similar presentation.

personalizes social or societal responsibilities by delineating the specific groups or persons business should consider in its CSR orientation. Thus, the stakeholder nomenclature puts "names and faces" on the societal members who are most urgent to business, and to whom it must be responsive"- Carroll, 1991, p.9.

"First, ..., stakeholder theory provides a way for ethicists to connect systematically with a wider conversation about business and organization [...] Second, ..., stakeholder theory provides a systematic and specific set of ideas around which one can begin to see what it means for a firm to care about ethics [...] Third, discussed and developed as a viewpoint that contrasts with prevailing assumptions about the purpose of business (especially Friedman, but also Jensen³⁵), stakeholder theory has provided a contentious context in which ethicists can highlight their work"- Freeman et al., 2010, p. 195-196.

Traditionally firms have been considered to operate in the interests of shareholders. They have been required to generate profits and increase their stock price. Companies' actions have been evaluated in terms of wealth creation for investors. The main argument has been that everything which is good for shareholders is good for the enterprise.

Freeman and Reed argued that this relation doesn't always necessarily hold true. Two possible notions of stakeholder are possible:

- 1) Wide definition: stakeholder is every group which influence the activity of a corporation. Stockholders are only one group of stakeholders. Other stakeholders are employees, customers, suppliers, lenders, local communities, governments... All these groups have a legitimate stake in the company.
- 2) Narrow definition: stakeholder is every group or individual upon which a company relies for its survival. This conceptualization of stakeholder excludes protest groups, public interest groups, trade associations... which normally cannot threaten the existence of an organization. It is the stakeholder definition established in the literature prior to 1983.

According to the authors, the wide sense of stakeholder is the one executives should use when managing firms. An action taken to maximize shareholders' wealth isn't always acceptable if it damages other stakeholders. Companies should take into consideration the needs of all stakeholders, not only stockholders. Then, they have to negotiate to reach a solution which is satisfactory for all parts and allocate resources to constantly monitor stakeholders' claims.

³⁵ Jensen (2001) is summarized below.

Monitoring is fundamental to tame the environmental variability: pre-emptive actions are preferable to reactive tactics. Firms should determine how each stakeholder can help in or prevent reaching their goals. Strategies are needed to meet stakeholders' concerns.

Distinct stakeholders have a specific type of power they can influence on the company: formal (shareholders, managers, etc.), economic (customers, competitors, etc.), political (government, trade associations, etc.). Many problems are extremely complex and lack a clear solution. Therefore, diversified firms need to invest significantly in CSR activities, because they are exposed to very different stakeholders' pressures (Liu and Xu, 2016).

Addressing stakeholders' needs is a source of competitive advantage in comparison to weak CSR engagement peers. This competitive advantage can also take the form of less costly financial resources (Cooper and Uzun, 2015), which can directly influence the level of corporate cash holdings.

Businesses must acknowledge when to, and to which extent, let stakeholders participate in the decision process. The assessment of the peculiar stake and power of each claimants should be performed in an integrate way and requires firms to stop focusing only on short-term objectives (addressed nearly exclusively to shareholders).

Firms should use two criteria to classify the importance of stakeholders' claims (Carroll, 1991): legitimacy (how much a stakeholder is justified in its claim, especially by a legal point of view) and power (to which magnitude a stakeholder can influence the activities of the corporation).

The stakeholder theory has become a staple of management thinking. It has originated the two dominant views of CSR in business (Doucin, 2011):

- 1) The utilitarian approach: CSR is good for companies because it allows to anticipate market trends and subsequent social and environmental regulation. It protects the firm reputation. Ethics do not matter. This approach is equivalent to the profit maximizing CSR view that followed Friedman (1970), but applies the stakeholder theory.
- 2) The risk management approach: enterprises should behave responsibly to obtain a license to operate in the society. Firms needs explicit and implicit governments and local communities' approval to do business. This view mixes Davis' (1960) Iron Law of Responsibility with the stakeholder theory (Carroll, 1999).

As successful as it is, the stakeholder theory has also been harshly attacked. The most famous disapproval was expressed by in Jensen (2001): stakeholder theory makes managers unaccountable for their decisions, because not all stakeholders' demands can be answered.

Different stakeholders have different requests (Su and Jie, 2015) and scarce resources push firms to answer only the demands of the most influential stakeholders (Artiach et al., 2010). The consequence is that firms engage in a series of short-sighted defensive actions against stakeholder demands and lose partial control of their CSR agenda (Kramer and Porter, 2006).

The stakeholder theory fails in providing a hierarchy of needs to meet. Jensen (2001) affirmed that the success of stakeholder theory is due to managers who do not want to be valued by the market. The maximization of social welfare can be achieved only through the maximization of firms' market value (debt, warrants, preferred stock and equity). The stakeholder theory leads to inefficiencies and competitive disadvantages because a clear objective is missing (*“stakeholder theory directs corporate managers to serve «many masters»”*; ibidem, p. 5).

Jensen proposed the concept of enlightened value maximization as the fundamental purpose of the corporation: long-term value maximization performed while focusing on answering the needs of all relevant stakeholders. What Jensen defined enlightened stakeholder theory isn't vastly different from the traditional view of the corporation. But it focuses its attention not only on shareholders, but also on debtholders. It also recognizes two cases in which corporate profit maximization differs from social welfare maximization (monopoly and negative externality), which should be resolved by governments.

The list of stakeholders to satisfy is very small: equity holders, creditors and owner of hybrid securities. Managers should only manage all other stakeholders so that they do not affect the current market value of the firm. Furthermore, differently by the traditional view of the corporation, the enlightened stakeholder theory requires the management to think on the effects of every action on less relevant stakeholders who could reduce the subsequent value of the firm. It forbids short-term profits at the expense of long-term value (*“The market is inevitably ignorant of many managerial actions and opportunities, at least in the short run”*; ibidem, p.13).

Corporate Social Performance

Wood (1991) proposed a theoretical framework which defined CSR as a single part of the broader concept of corporate social performance.

CSR comprises three separate levels:

- 1) Institutional level: Davis (1960) Iron Law of Responsibility. Society grants power to businesses. If firms fail to use this power in a way that is accepted by society, they will lose legitimacy and power in the long run. Companies must not abuse their power.
- 2) Organizational level: corporations are responsible for all social issues related to their activities. They are required to remedy to all concerns they contribute to generate. Hence, organizations cannot be asked to solve all problems. But nothing prevents them from taking care of issues beyond their direct influence (rule of relevance).
- 3) Individual level: since managers are moral actors, they must exercise moral judgment in dealing with corporate topics. They should long for socially responsible outcomes. it resembles Carroll's discretionary (1979)/philanthropic (1991) responsibility.

Wood (1991) defined these three levels as principles of legitimacy, public responsibility and managerial discretion. However, CSR alone isn't sufficient. Companies are also required a certain level of corporate social responsiveness. Summarizing the existing research, for Wood corporate social responsiveness comprises three elements:

- 1) Environmental assessment: the environment in which companies operate is not static, but dynamic. The assessment of the various components of the environment (social, legal, economic, political, technological) is fundamental to be responsive to CSR pressures.
- 2) Stakeholder management: Freeman (1984) stakeholder theory demonstrated that companies must constantly monitor stakeholders to meet their requests. Failure in identifying stakeholders' needs has adverse consequences.
- 3) Issues management: effective internal processes to respond to social issues are necessary for social responsiveness. Issues management has practical effects on corporate performance.

The three elements of responsiveness – context, actors and interests - are interconnected. The results of the corporate social responsiveness are the social outcomes of corporate behavior.

They include three facets:

- 1) Social impacts: they are either positive (job creation, new products, payment of taxes, technological innovation...) or negative (oil spills, bribery, toxic wastes, harmful products...).
- 2) Social programs: corporate investments in social programs have the goal to meet certain ends that companies deem socially desirable. Social programs can be one-time initiatives or institutionalized long-term ventures.
- 3) Social policies: they are used to help decision making in case of recurring social problems and to effectively take advantage of areas considered of great interest. Social policies become organizational routines and save time.

Principles of corporate social responsibility

Institutional principle: legitimacy
 Organizational principle: public responsibility
 Individual principle: managerial discretion

Processes of corporate social responsiveness

Environmental assessment
 Stakeholder management
 Issues management

Outcomes of corporate behavior

Social impacts
 Social programs
 Social policies

Figure 3: The Corporate Performance Model.

Source: Wood (1991).

Although Wood's framework was a significant advance in CSR research, it was still too abstract. It's hard for companies to operate following the principles of the model (Jamali, 2008).

Triple bottom line

The concept of triple bottom line was introduced in 1994 by Elkington³⁶. It can be considered the next breakthrough in the CSR literature after the stakeholder theory. It focuses on the sustainability of corporate activities. Long-term economic results should not be associated with a reduction of socially irresponsible or environmentally damaging acts. The triple bottom line concept works well for companies which can directly increase their profits by following it

³⁶ Elkington (1994) focused primarily on environmental matters. However, his conclusions have influenced profoundly the whole CSR literature. Here, Elkington remarks are presented in terms of all dimensions of CSR, as in Elkington (2004).

(Kramer and Porter, 2006). Firms are expected to incorporate social and environmental considerations in their strategy. They are required to focus on sustainable development, that is on activities which generate wealth for the current generation without harming the quality of life of future generations. As Elkington (1994, p. 2) noted: *“In contrast to the anti-industry, anti-profit, and anti-growth orientation of much early environmentalism, it has become increasingly clear that business must play a central role in achieving the goals of sustainable development strategies”*.

The main cause of this shift is public opinion. In the age of globalization consumers should be/are³⁷ ethical. They do not simply desire sustainable development, but require it. Therefore, CSR is a source of competitive advantage that businesses must integrate in their strategic thinking. They can do it in three steps:

- 1) Be sustainable. This requires also to choose only socially responsible suppliers and to periodically review the sustainability performance of the current suppliers.
- 2) Planning diligently the communication related to CSR activities. Senior managers must personally take care of social disclosure because a badly performed process can undermine their firm’s competitive position.
- 3) Transforms as many stakeholders as possible in customers. If the second step is successful, the company reputation is enhanced. Businesses are then called to explore the new market opportunities. This last step is the most critical because every minimum failure to meet a sustainable standard can compromise the customers’ acquisition process.

The result is the total integration of the social, environmental and economic dimensions (Elkington, 2004). Companies have to manage those three aspects simultaneously. The term “triple” bottom line underlines how the impacts of businesses on the society and the environment are as relevant as its economic goals. They are not a mere mean to improve their accounting bottom line.

Four types of corporation exist:

- Locusts: firms which destroy the environment and the society to fulfill their economic role. They’re only focused on profit maximization.
- Caterpillars: they are like locusts, but creates damages only locally. Their activities have a low impact on the surrounding environment and society.

³⁷ Elkington (1994) wasn’t clear on the point.

- Butterflies: predominantly small companies which have a sustainable business model and expressly address sustainability concerns in their strategy. However, as they grow, their business models become less and less sustainable
- Honeybees: enterprises which, like butterflies, follow a sustainable path and strong ethical principles. But they reshuffle their business models over time if it is needed to be continuously sustainable.

The final goal of the triple bottom line is to allow companies to transform from corporate locusts to honeybees. All other forms of organization should disappear. The triple bottom line requires managers to shift their line of reasoning to a new paradigm which entails seven “sustainability revolutions”:

- 1) Markets: CSR is a form of competitive advantage in an era of increasing competition due to internationalization. Conforming to the minimum regulatory standards will drive companies out of business.
- 2) Values: companies need to reassess continuously their CSR performance considering the constant modification of social values. What is accepted today could not be acceptable tomorrow, and vice versa.
- 3) Transparency: voluntary, not mandatory disclosure should be the cornerstone of a CSR strategy. The new information technologies allow stakeholders to rapidly have access to a broad range of information on many businesses. Any gap in disclosure is considered a weakness by social-conscious investors who prefer to invest in firms with a high degree of transparent reporting.
- 4) Life-cycle technology: companies must consider the sustainability of the whole supply chain. Being sustainable in the production process isn't sufficient. From raw materials extraction to post-consumption events (recycling and disposal), every step of the cycle should be analyzed and programmed.
- 5) Partners: campaigning groups are not only enemies, but also allies of enterprises. They can help identify lackluster social or environmental performances. Shared and agreed sustainability programs can enhance a company's reputation.
- 6) Time: managers are required to modify the usual business plan from a short-term perspective to a long-term one. Corporate programs may have externalities far away in the future. Scenario analysis is of fundamental importance.
- 7) Corporate governance: sustainability can be reached only if the corporate governance is strong and effective. Companies should evaluate which is the fittest corporate governance mechanism. Board of directors should be more inclusive and a better

balance between shareholders and stakeholders' representation must be found. The optimal corporate governance ensures that firms assign the correct importance to the three elements of the triple bottom line.

The originality of the triple bottom line lies in assigning the same weight to the economic, social and environmental dimensions. Shareholder wealth is considered as important as sustainability issues. Previously, academics had generally put the emphasis on one specific topic (environment protection, profitability, social problems...), considered more significant than the others.

Corporate Shared Value

A further step in the CSR literature was the integration of sustainability in management strategic frameworks (Wang, 2015). Kramer and Porter (2006, 2011) corporate shared value is probably the most famous of these frameworks.

The two scholars (2006) underlined how the preexisting CSR literature lacked to provide specific guidance to businesses, focusing only on points of clash between companies and the society instead that on their interrelationship. They criticized the stakeholder approach to CSR because what needs to be measured is the social impact of firms' activities, not stakeholders' satisfaction (*"the focus must move away from an emphasis on image to an emphasis on substance"*; ibidem, p.14).

If correctly approached, CSR is a source of competitive advantage and not a constraint. The problem is that CSR is often considered by corporations only after public criticism is addressed to companies for responsibilities they didn't deem to have. Enterprises generally release sustainability reports to highlight their CSR commitment. But those reports only present favorable data: they are used as an advertising tool.

Reputation is a main driver of CSR initiatives. Firms are interested in obtaining high CSR ratings by non-profit organizations or consulting firms, but those classifications are highly subjective in their components. The result is *"a jumble of largely meaningless rankings, allowing almost any company to boast that it meets some measure of social responsibility-and most do"* (ibidem, p. 4).

Kramer and Porter presented a five-step approach to CSR to address the status quo:

- 1) Identifying the so called shared value between corporations and society. Only actions which benefit both firms and society will be successful in the long term. Two different intersections are possible:

- Inside-out linkages: society need strong corporations (jobs, wages, taxes...). The effect of companies' everyday operations on society at large depend on time (social standards vary over time) and location (different nations have different cultures).
 - Outside-in linkages: firms need a healthy society (property rights, health care, education...) to prosper. The effect of society on corporations encompasses business inputs (e.g. infrastructures), law, demand, and availability of supporting industries (e.g. service providers).
- 2) Selecting the dimension of CSR in which to operate. CSR initiatives should be taken only if they create shared value, that is they benefit both the business and the society. CSR commitments should not be undertaken if they don't create shared values, even though they are beneficial for one of the party. A firm must classify a social problem in one of three categories:
- Generic social issues: social issues not affected by the company's operations which do not affect the company competitiveness. Solving these issues create value only for society.
 - Value chain social impacts: social issues significantly affected by the company's operations. On some occasions, they could create shared value if corrected.
 - Social dimensions of competitive context: social issues that influence the competitiveness of the firm. Focusing on one of these problems always benefit both the society and the corporation.
- 3) Creating a CSR portfolio. After classifying social issues, firms should form an agenda of shared value activities. When prioritizing matters, they should look beyond the explicit request of stakeholders. Two kinds of CSR are possible:
- Responsive CSR: it encompasses satisfying stakeholder requests and reducing negative externalities of the operations. It improves the quality business relationships and can increase efficiency, but it is usually limited to reach a satisfactory (not optimal) state.
 - Strategic CSR: invest in CSR activities which create shared values. Both the competitiveness of the firm and the condition of society improves.
- When prioritizing matters, they should look beyond the explicit request of stakeholders. In doing so, they will be able to shift from responsive CSR to strategic CSR.
- 4) Integrating inside-out and outside-in: strategic CSR involves both inside-out and outside-in linkages concurrently. The mutual influence of corporate behavior and society reinforces the effect of CSR.

- 5) Adding social elements to its products: firms should add a social dimension to their value propositions. It isn't necessary to build the entire company offer on sustainable factors.

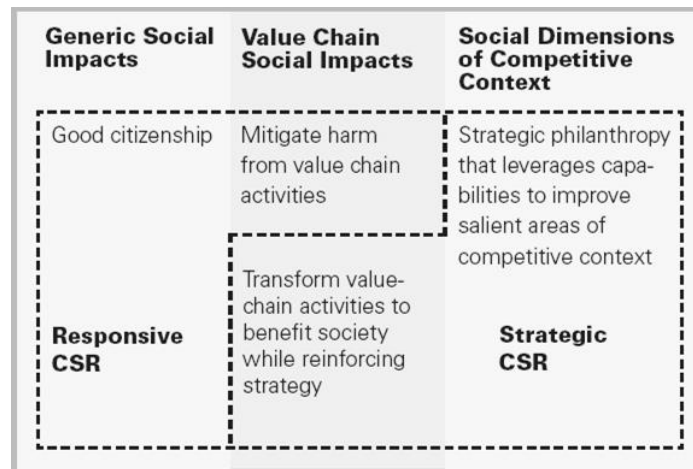


Figure 4: Strategic approach to corporate involvement in society.

Source: Kramer and Porter, 2006.

The idea of shared value differs from the utilitarian approach to CSR because it considers CSR the cornerstone of corporate strategy, not an ancillary element (Bosch-Badia et al, 2013). The company's best objective is neither maximizing profits nor improve society (shared value is value relative to costs incurred, not only benefits). Rather, firms should pursue shared value creation (Kramer and Porter, 2011), which can be considered the subset of business activities with positive externalities. Furthermore, shared value has no moral implications and does not imply any redistribution of resource (as for example through charitable donations in traditional CSR).

Shared value can be created in three ways, which are mutually reinforcing:

- Reconceiving products and markets: the last step of the strategic CSR approach, it pushes companies to think about social needs, harms and benefits that its goods and services embody. It opens the possibility to discover new markets or to differentiate in existing ones.
- Redefining productivity in the value chain: social issues can create costs along an enterprise's value chain. Negative externalities created by a firm can backfire and

impose additional costs, even without Coasean solutions³⁸, on various parts of the value chain (procurement, logistics, distribution...).

- Enabling local cluster development: a cluster is geographic area which houses several firms operating in an industry operating at different levels of the value chain (e.g. the information technology cluster in California's Silicon Valley). Building clusters generates shared value because it increases a company's productivity and improves the conditions of local communities.

Kramer and Porter thus underlined a new rationale for CSR. Their model originality lies in differing from the stakeholder theory approach (CSR should be used to meet stakeholder requests) which has been dominant in the literature. In a sense, it can be considered the continuation of Carroll's pyramid and Elkington's triple bottom line ("*not all profit is equal...profit involving a social purpose represent a higher form of capitalism*"; Kramer and Porter, 2011, p.15). It reconciles the most extreme CSR paradigms (sustainability and social welfare should be the main objectives of corporations) and the anti-CSR line of reasoning (profit maximization is the only objective of corporations; CSR is useful only to the extent to which it enhances profits). It blurs the distinction between profit and not-for-profit organizations (Figure 5).

After the various publications on the integration of CSR and corporate strategy, a new stream of studies is trying to incorporate CSR into leadership theory. CSR is considered as a commitment dictated by the leadership style of the "responsible leader"³⁹(Wang, 2015). Being very recent, this conception of CSR hasn't drawn mainstream attention yet.

CSR AND PERFORMANCE

A good chunk of the CSR literature investigates the relationship between corporate citizenship and financial performance. CSR can have both a positive and a negative effect on performance. On one hand, lower environmental damages reduce production costs. Litigation costs decreases and the brand value is enhanced (Menz, 2010). On the other hand, being sustainable imposes additional costs such as voluntary safety standards, non-polluting production sites, charitable donations, etc. (Artiach et al., 2010) The effects of CSR on performance is a matter of whether the better reputation and brand loyalty outweighs the direct costs of being socially friendly.

³⁸ Coasean solutions redefine property rights so that all negative externalities are internalized. The result is the social optimal level of production.

³⁹ The argument is not very different from the good management mechanism hypothesized in the CSR-firm performances empirical research (see below).

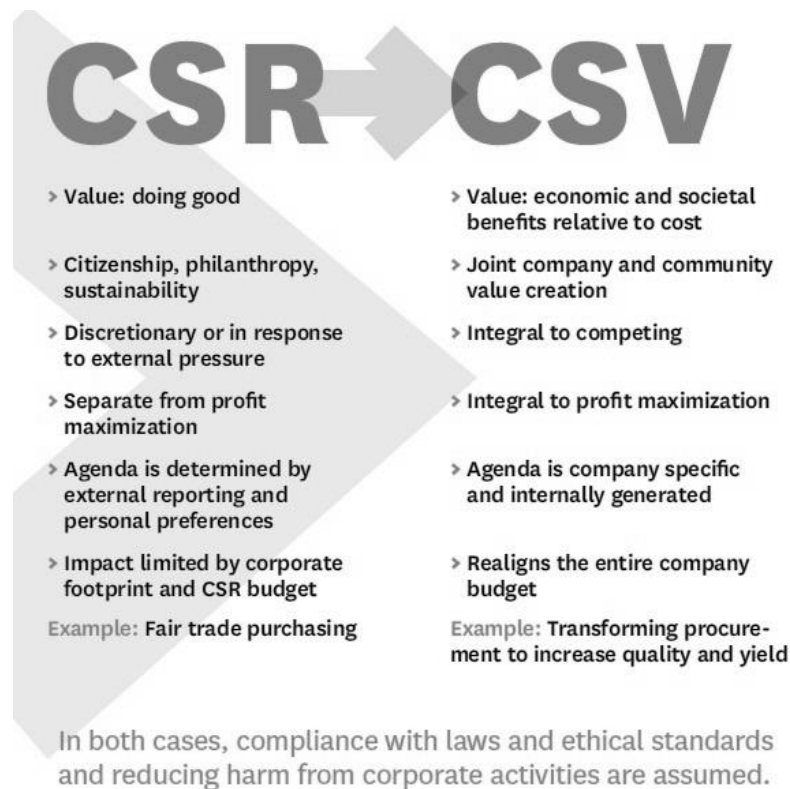


Figure 5: From Corporate Social Responsibility to Corporate Shared Value.

Source: Kramer and Porter, 2011.

The trade-off may result in no direct association between CSR and financial performance. Instead, if CSR positively impacts performance, it is possible that firms introduce CSR policies by a strategic management perspective. In general, CSR is linked to significant agency costs (shareholders' wealth is used to benefit someone else; Attig et al., 2014). Empirical findings on effects of CSR on corporate performance are mixed (Kim et al., 2014), maybe because the intangible benefits of CSR do not have strong accounting representation (Aupperle et al., 1985). Researchers found a positive, negative, U-shaped or inverse U-shaped relationship between CSR and performance (Chang et al., 2014), with a predominance of the positive relationship (Mikołajek-Gocejna, 2016). Other studies found no relationship at all between CSR and financial performance (Pour et al., 2014).

A partial explanation of this uncertainty may be found in the subjectivity of CSR scores. Since the corporate CSR commitment is an interrelation of positive and negative factors, quantifying it in a recapitulatory measure is difficult (Menz, 2010). A "correct" way to measure CSR does not exist (Aupperle et al., 1985). The influence of CSR on performance could also vary among sectors. At a more granular level, different industries may have a different sensitivity to CSR effects on performance (Cooper and Uzun, 2015).

A sizeable portion of the research cannot be trusted because wrongly specified. Many studies only use short-term accounting measures when modelling CSR financial benefits (Attig et al., 2014). Moreover, enterprises that engage in CSR generally pursue a differentiation strategy. Not controlling for research and development expenses (and for the advertising intensity of the industry, which is a proxy for barriers to entry) generates bias in the regression model. Some consumers presume that CSR supporting firms have higher quality products and/or want to buy only goods with social attribute (Abigail and McWilliams, 2000). The level of R&D expenditures is indeed a main driver of CSR activities (Alikaj et al., 2016).

The sign of the relationship between CSR and performance could also not be of fundamental relevance: CSR engagement may be advisable even if it has a neutral or a negative financial effect. When demand for socially responsible firms exceeds supply, CSR investments can increase a company's market value although they reduce the present value of its future cash flows. Investors objectives may be broader than simply maximizing their own wealth. Conversely, if demand for socially responsible firms is lower than supply, reducing CSR investments increases a company's market value (Mackey et al., 2007). Socially responsible investors, who consider the social sustainability of a company business when screening, have increased in recent years (Artiach et al., 2010). Responsible firms show a lower cost of equity than irresponsible companies (Girerd-Potin et al., 2014).

Researchers have proposed various mechanisms through which CSR can positively influence financial performances (Gainet, 2010; Kang et al., 2016):

- 1) Slack resources mechanism/resource view
- 2) Good management mechanism
- 3) Penance mechanism
- 4) Insurance mechanism
- 5) Corporate visibility
- 6) Information asymmetry

The literature has found support for all these mechanisms. But one of the research's limitation is that it has not investigated all mechanisms simultaneously (at best, two at a time). The mechanisms may all be correlated among them. Kang et al. (2016) analyzed the first four mechanisms simultaneously, founding support for the good management and penance mechanisms, but not for the slack resource and insurance mechanisms. Moreover, these mechanisms may not be the direct channels through which CSR influences performances. According to Pour et al. (2014), under the slack resource and good management mechanisms

CSR improves the market performance (the stock price), but doesn't lead to better financial performances.

If CSR positively impacts performances, it is possible that firms introduce CSR policies by a strategic management perspective. A higher commitment in terms of CSR in foreign countries should (in theory) be associated with higher cash reserves abroad.

Slack resources mechanism/resource view

The availability of more resources than needed allows companies to perform CSR activities. A socially responsible attitude is used as a promotional tool for the company. But insincere CSR activities rarely fool stakeholders (Ross and Roberts, 2016). Corporate size has a primary role in CSR: bigger firms can afford to spend in CSR and can spend more than smaller competitors in CSR initiatives (Menz, 2010).

CSR is not a key success factor. CSR activities and good financial performances are correlated simply because only firms doing well financially engage in CSR. Better, firms perform CSR activities because they're doing well (Kang et al., 2016). They are the only ones which can invest in CSR (Artiach et al., 2010). If CSR per se creates value for the company is uncertain in the slack resource mechanism.

CSR can alternatively be considered a waste of scarce resources. Meeting stakeholder requests often result in not maximizing shareholders' wealth. Moreover, managers are willing to spend in CSR activities because they gain private benefits (personal reputation) at the expense of stockholders - the "overinvesting view" (Ross and Roberts, 2011). This idea is comparable to the spending hypothesis in the cash holdings literature. CSR determines, ceteris paribus, a lower level of cash holdings.

A small number of interviews to executives by Kang et al. (2016) revealed that top managers are not willing to invest in non-value generating CSR activities. They want to avoid any reduction in their variable compensation.

Excess cash is the primary source of CSR activities. The more available liquid assets are, the more CSR activities should be performed (Gainet, 2010). This reasoning can lead us to two different predictions:

- companies engaging in CSR activities should have higher cash holdings, because they perform well;
- low cash reserves may be associated with both low and high levels of CSR activity. Poor performing companies do not generate excess cash and do not follow a socially

responsible policy. Also, some well performing firms may have small treasury because they use the excess cash in CSR activities.

This insight suggests a non-linear relationship between CSR and cash holdings.

Good management mechanism

Good managers naturally engage in socially responsible activities. They see CSR as way to manage risks (Gass and Roberts, 2011). CSR focused companies have superior performance thanks to their managers: they create better relationships with stakeholders, thus reducing the firms' perceived risk (Attig et al., 2014).

The proponents of this concept found no conclusive agreement on whether CSR creates or destroy value (although most academics argued the latter). Companies can do well because they do good or do good because they do well. CSR can be considered a source of competitive advantage if it creates wealth for shareholders, especially in competitive markets (Chih et al., 2010). But Alikaj et al. (2016) found that the market concentration does not directly influence CSR. It's the level of R&D expenditures which drives CSR.

The good management system is debatable in case of a clear positive effect of CSR on shareholders wealth by means different from risk mitigation. Managers will invest in CSR even if they do not personally believe in the concept of sustainability (Mackey et al., 2007).

This mechanism makes no direct predictions on the level of cash holdings. Since what cash management policy is followed by good managers is a hotly debated topic in the cash holdings literature, no clear indication can be obtained by the good management idea.

This idea has a parallel in the accounting field. Kim et al. (2012) transparent reporting hypothesis states that the managers of socially responsible businesses are committed to greater transparency. They found that CSR engaging firms have a higher financial reporting quality. Managers of such companies are less likely to perform earnings management through discretionary accruals and accounting manipulation of real activities, designed to mislead shareholders. Because of their less opportunistic behavior and stronger accounting conservatism, highly performing CSR enterprises are less likely to be subject to market authorities' investigations. However, the empirical evidence on the transparent reporting hypothesis isn't definitive: Gutsche et al. (2016) found no support for it.

Penance mechanism

CSR activities are used by firms to offset the reputational damage caused by past corporate social irresponsibility (CSI), intended as “*a set of actions that increases externalized costs and/or promotes distributional conflicts*” (Kotchen and Moon, 2011, p.4). Companies which caused more social damages are also the ones which engage more in CSR. Firms reduce the external costs inflicted to the environments in which they operate. CSR engagement is a necessary penance to be accepted by the society.

CSR is thus an instrument to offset the negative reputation caused by CSI. It is a remedy to negative externalities created by business activities. CSR benefits exceed its costs and its overall impact on performance are positive. CSR allows enterprises to invest in sinful projects (alcohol, tobacco, gambling...) or reduce costs (e.g. using carbon as a source of energy) without substantial repercussions.

More CSR is equivalent to less CSI. But companies with weak corporate governance prefer to spend more in CSR than reform their governance mechanism (ibidem). CSR could be considered a way for C-level executives to keep their power⁴⁰.

The penance mechanism is intertwined with the corporate visibility mechanism (see below). Firms operating in industries under more public scrutiny rely more on the CSI redemption effect of CSR. The penance mechanism has no implications in terms of cash holdings.

Insurance mechanism

The insurance mechanism recognizes the same value of the penance mechanism to CSR but supposes an alternative purpose of socially responsible demeanor.

A company engaging in CSR is trusted by the society. Firms build reserves of goodwill to be insured in case of future CSI (Minor and Morgan, 2011). CSR is an ex-ante penance. It is an insurance to protect reputation, which can be the most relevant corporate assets. Differently from the penance mechanism, though, CSR and CSI haven't got the same magnitude. CSI and CSR of the same amount leads to a worse reputation than doing nothing at all, neither positive nor negative.

Furthermore, still in contrast to the penance mechanism, CSR activities must concern the same aspect of the firm's business impacted by CSI to effectively protect corporate reputation. The key point is that not performing irresponsible acts is better than harming

⁴⁰ This interpretation is personal. Kotchen and Moon (2011) did not provide any explanation of why companies may prefer not to reform their governance systems.

someone/something and using CSR to offset the damages created. CSR only has a partial insurance effect (*“it can take years to build “good” reputation but only days or months of “bad” activities to wipe it away”*; ibidem, p.7). This fact seems to be in accordance with the good management mechanism: while it’s easy for bad managers to advertise CSR to try to amend for CSR, good management skills are needed to avoid any harmful activity. At the same time, this idea contradicts the corporate visibility mechanism (see below): CSR is more visible than no CSI, but less powerful in terms of moral stature.

The problem is that CSR activities are not necessarily followed by CSI. If no CSI event happens, CSR is a waste of resources and negatively affects performance. But responsible firms (in the sense of firms not consciously generating CSI) do not know when CSI accidents will happen. Past CSR positively impacts performance (by limiting damages) only if a company shows irresponsible behavior. A complex cost-benefit analysis of CSR is necessary if the only rationale is the insurance mechanism, since it may fail for two reasons. First, stakeholders could have a negative opinion of CSR following CSI. Second, high CSR expenditures after a CSI incident can also lead stakeholder to believe that the damages caused by firms are greater than what they initially thought (Kang et al., 2016).

The insurance mechanism tells us nothing on the level of cash holdings.

Corporate visibility

The corporate visibility concept states that the level of CSR activities is a result of the public visibility of businesses (Gainet, 2010).

Enterprises prioritize stakeholders which control critical resources and give little or no attention to irrelevant stakeholders. The level of CSR engagement varies across firms because of a different range of stakeholders (Artiach et al., 2010). CSR is the response of businesses to stakeholders’ demands. The general public is likely to focus its attention on large companies, which can originate greater social and environmental problems. Big firms face stronger political pressure and public scrutiny. They are more likely to actively engage in CSR, because a passive CSR strategy may be particularly dangerous for them. Activists may target large firms on a specific topic, even if those companies bear little or no responsibility, to draw attention (Kramer and Porter, 2006).

Chih et al. (2010), investigating the financial sector, found that the level of CSR isn’t directly correlated with performance, but with firms’ size. Other studies confirmed that bigger companies have better CSR performances (Artiach et al., 2010; Gainet, 2010) and spend more

in CSR initiatives (Chauhan, 2014). The corporate visibility mechanism can cause CSR commitments to have negative implications on small companies' financial performances, even if they improve large enterprises' economic results. Smaller firms have not only limited visibility, but are also less able to influence stakeholders (Cui et al., 2015). The corporate visibility mechanism translates also to the market effects of CSR: big irresponsible companies are punished by investors more than smaller businesses by means of a higher cost of equity (Girerd-Potin et al., 2014).

Information asymmetry

CSR reduces the information asymmetry between capital provider and companies (Gainet, 2010). This results in better financing conditions for firms. An involvement in sustainable projects creates social capital for businesses (Kim et al., 2014) and trust towards the management. CSR is useful to manage stakeholders (Artiach et al., 2010).

Goering (2010) demonstrated that a durable goods producer may engage in CSR activities even if there aren't the conditions that the literature traditionally identify as the rationale to invest in sustainability (no demand for social products, no negative production externalities). CSR can reduce information asymmetry between companies and consumers. If CSR only increases costs, CSR activities have a signaling effect to buyers: enterprises bind themselves strategically to a lower future output (due to the increased production costs), convincing the current buyers that the market will not be saturated by the product they're purchasing. Buyers do not expect a strong reduction of the value of the units they are willing to buy, and thus present sales should increase. CSR is profitable if it generates additional revenues greater than the costs incurred by firms to perform CSR activities.

According to this theory (as investigated in the CSR literature), capital structure is a determinant of CSR. Since debt reduces free cash flow (Jensen, 1986), highly indebted firms should invest less in CSR.

There's no clear implication in terms of cash holdings, as there's no agreement on the effect of agency costs in the cash holdings literature (e.g. flexibility vs spending hypothesis).

Since academics debate the influence of capital structure choices on cash holdings the information asymmetry theory does not have a clear implication in terms of cash holdings.

CSR AND TAXES

Publications investigating the connection between CSR and tax compliance have obvious impacts for the tax motive to hold cash.

One of the main stakeholder for businesses is the government. Companies are required to pay taxes, which are used by the government to purchase public goods. Taxes are comparable to CSR: scarce resources are allocated to stakeholders different from shareholders. However, taxes are not discretionary, but linked to income - even though managers can use tax planning strategies to minimize taxation (Davis et al., 2015). They do not show strong future earnings as CSR, but are useful to reduce the political scrutiny (Watson, 2015). Tax compliance has been recognized as the most important element of corporate citizenship. Tax avoidance transforms corporations in free riders which distort the market compared to local businesses: tax avoiding firms require high quality public goods (education, health, transport infrastructure, ...) without bearing the costs (Christensen and Murphy, 2004). But not all firms regard tax compliance as part of their CSR strategy.

Shareholders of socially responsible firms may consider tax compliance either as part of the CSR attitude or not necessary in light of the firms CSR initiatives. They can fear managers who deceive the government (similar managers could also deceive stockholders) or appreciate tax optimization programs as cost reduction strategies. But companies with a high number of publicly held shares are more CSR oriented (Gainet, 2010) and firms which use tax services provided by external auditors are more likely to follow aggressive tax minimization strategies if their corporate governance is weak (Huseynov and Klamm, 2012). Maybe managers, not shareholders, are the primary supporters of tax avoidance practices.

Some businesses affirm that reducing corporate taxes leads to more investments. More investments create more innovation, jobs and growth, benefitting the whole society. The higher income level of the community creates additional sources of taxation (higher profit for suppliers, greater employees' salaries, ...) ⁴¹. By this point of view, taxes go against the principle of sustainable development, since firms are more efficient than governments in allocating scarce resources (Davis et al., 2015). Furthermore, tax avoidance is facilitated and validated by tax competition among developed and developing countries (Christensen and Murphy, 2004).

⁴¹ This idea can be considered as the application at the corporate level of the trickle-down economics proposed by the Reaganomics. It also encompasses the Laffer curve theory.

Companies are more aggressive in their tax planning the lower their resources (income) are, regardless of whether they engage CSR. Low earnings enterprises, being less monitored, can more easily avoid taxes. Social irresponsible firm avoid more taxes than social responsible ones. They care more about preserving profits than general wealth, since taxes are one of the biggest corporate expense. Resource scarcity is a determinant of both tax compliance and CSR attitude (Watson, 2015).

Davis et al. (2015)⁴² found instead that U.S. CSR minded firms pay less domestic taxes. Companies which spend more on CSR have lower effective tax rates and higher lobbying expenditures. Lobbying activities have the purpose to obtain a lower tax rate. CSR and taxes are not complementary by a corporate point of view, but substitute. Taxes are willingly avoided by sustainable enterprises because either they believe their CSR initiatives can increase the general welfare more than the government do or CSR activities are performed to create “moral capital” in order to cover a past low tax-compliance (the penance mechanism). The authors suggested the latter⁴³.

The relationship between CSR and tax compliance is made even more complex by the fact that governments worldwide offers tax incentives, such as tax rebates and deductions, for corporate CSR activities (Kasipillai and Rachagan, 2013).

The contradictory results of the research do not provide any clear insight on the liquidity of CSR minded businesses even if we accept the tax motive for holding cash.

CSR AND ACCESS TO FINANCE

The relationship between CSR and access to finance is interesting for its possible implications in terms of cash holdings.

CSR could influence corporate treasuries by conditioning the capital constraints faced by firms. Since financing frictions may impede enterprises to invest in positive NPV projects, CSR may create value for shareholders. It could allow companies to undertake all profitable investments. If CSR improves access to finance, the implications are twofold. On one hand,

⁴² Note that Davis et al. (2015), differently from what has been done in most comparable studies, didn't include a governance measure in their CSR score. They motivated the choice as follows (ibidem, p. 19): “*The link between corporate governance and tax avoidance has been studied previously and is different than the link between CSR and taxes, which is the focus of our study*”. They controlled separately for corporate governance by adding variables on the age and sex of managers on a subset of the sample.

⁴³ Davis et al. (2015, p. 6, note 7) argued that “*some activities that improve social welfare also decrease tax payments through tax credits. For example, expenditures on energy-saving technology improve the environment while, at the same time, generating tax credits*”.

higher CSR commitment could be associated with lower cash holdings as per the precautionary motive. If the constrained liquidity theories and/or hedging perspective hold true, CSR should relax capital constraints. Firms may obtain scarce resources from the market instead of hoarding cash to avoid future under-investment issues. A lower cost of capital also increases the number of profitable investment opportunities. On the other hand, easier access to finance could allow firms to hoard more cash if they're willing to do so.

As in general with the whole CSR literature, the empirical evidence on this point is unclear, especially because it seems to vary depending on the identity of the lender. The relationship could be distorted by other elements, not always easily identifiable to allow the use of control variables. For example, Cooper and Uzun (2015) found a weaker link between CSR and cost of debt for companies with high managerial ownership, suggesting that creditors anticipate the increased risk attitude of managers-owners, and documented a lower cost of debt for CSR firms only in the financial and manufacturing sector.

Menz (2010) found that the risk premium in the bond market is higher for socially responsible firms. This fact holds true even though retail investors play a minor role in the market, opening the possibility for institutional investors to price the CSR commitment. Since the higher responsibility induced to managers by a CSR attitude should warrant a lower risk premium, the author concluded that CSR is not be considered by investors when pricing bonds. The reason may be that credit rating intrinsically consider some elements of sustainability (e.g. relationships with the government in terms of tax compliance and potential fines), notably sector specific risks (for example an oil spill for oil companies).

Gainet (2010) documented a weak negative relationship between CSR and debt in European enterprises, implying that even if CSR reduces capital constraints, the effect isn't strong enough to heavily influence capital structure choices. Cooper and Uzun (2015) found a lower cost of debt for CSR engaged financial and manufacturing firms.

Goss and Roberts (2011) found that CSR activities performed by low credit rating borrowers help reduce the cost of bank debt, whereas CSR is completely irrelevant to high credit rating companies in search of debt capital. The effect for low credit rating firms is however small, suggesting that CSR is only a secondary determinant of the cost of debt. Banks have access to reserved information which usually aren't disclosed to other potential creditors, and have a better ability to assess the creditworthiness of enterprises. CSR activities can't cover financial deficiencies, since "in situations where agency problems are most likely to be acute, creditors punish spending on CSR initiatives" (Goss and Roberts, 2011, p. 14). Similarly, Kim et al.

(2014) provided evidence that the adoption of business ethics practices (in its notion of subset of CSR initiatives, see above) results in lower syndicated loan rates. The relationship is strengthened if the financial institutions providing the loan also follow ethics programs, especially if the cultural distance between lender and borrowers is small (in this case business negotiations are facilitated).

Instead Cheng et al. (2014) argued that the more a company engages CSR activities, the better the access to finance it has. CSR influences access to finance through two channels (*ibidem*):

- 1) Reduction of agency costs thanks to higher stakeholder engagement, which reduces opportunistic behavior and contracting costs
- 2) Lower information asymmetry because of increased transparency. It is likely that CSR minded businesses disclose the actions they take for sustainability to differentiate themselves much more than their non-CSR focused peers. Corporate social disclosure may also have an influence on the internal control system, leading to higher reporting standards

Attig et al. (2014) found that these same two channels influence the investment-cash flow sensitivity, that is the sensitivity of investments' expenditures to the availability of internal resources. The investment-cash flow sensitivity is lower in high CSR companies. Voluntary CSR activities allow companies to build long-term relationships with stakeholder by lowering information asymmetries and reducing agency costs. The quality of corporate information increases. The reduction of information asymmetries due managers' superior information leads to improved access to finance and create a competitive advantage. Thus, CSR operates as a "fixer" of market imperfections, closing the gap between the cost of internal and external financing.

CSR overall may have no effect on leverage (Artiach et al., 2010). However, one dimension of CSR which have a strong effect on the leverage policy is the importance given to the well-being of the workforce. Companies which treat employees better are less indebted (Verwijmeren and Derwall, 2010). They want to minimize the negative effects that a possible bankruptcy has on human resources. They prefer to issue equity instead of debt, in accordance with the pecking order theory (Myers and Majluf, 1984) and have better credit ratings.

CSR AND LEGAL SYSTEMS

Studies connecting CSR and legal systems are interesting in the context of this work, because they can be linked to the diversification culture/institutions hypotheses of the cash holding literature.

Environmental sustainability is stronger if there is an intense national regulation (Elkington, 2004). The effects of law on the social elements of CSR is instead ambiguous (Gaignet, 2010). Rules created to improve sustainability can reduce the effectiveness and scope of CSR initiatives if badly designed (Kramer and Porter, 2011). Weak institutions may exercise only a limited pressure on firms and social norms may not be respected (Cui et al., 2015).

Multinational companies operating in global industries tend to follow a global corporate responsibility strategy to achieve economies of scale. They comply with international sustainability indexes. The institutions of the country of origin influence the effectiveness of the CSR strategy pursued (companies from Nordic European and liberal countries exhibit higher financial performance). If their industry isn't global, enterprises use a multi-domestic CSR approach: the CSR activities performed in foreign countries are designed to respond to the needs of the local environment. This model leads to local CSR issues, since the request of stakeholders in different countries can conflict (Bajo and Duran, 2014).

Furthermore, the CSR performance may be related to the level of industry diversification (Dastgir and Patrisia, 2017), regardless of the country of operations. Diversified businesses invest more in CSR (Liu and Xu, 2016). Companies adopting unrelated diversification strategies, operating in several different industries, tend to perform better than their peers which follow related diversification strategies. The latter are exposed to less coherent stakeholders' demands, and face a lower institutional pressure, having to deal with a more similar set of regulations. The lower the level of diversification, the lower the level of CSR engagement. A possible explanation⁴⁴ is indeed that law significantly influences companies' attitude towards sustainability. The more heterogeneous the regulations an enterprise has to conform to, the better CSR performances could be.

Globalization modified what firms are expected to do towards society and the environment (Chauhan, 2014). Internationalization and entry to new markets may dramatically modify a

⁴⁴ This line of reasoning is personal. Liu and Xu (2016) explained the empirical evidence with the insurance mechanism and the slack resource mechanism (diversified firms are less exposed to single industries' cyclicity and can stick to a planned CSR investment program thanks to uncorrelated cash flows).

business' CSR policy (Mackey et al., 2007). An alternative explanation to the stronger CSR commitment exhibited by firms facing diverse sets of regulation is that companies entering in a foreign market have low invested capital in this new country of operation. The negligible sunk cost investments and the high growth opportunities give those companies more incentives to engage in sustainable projects (Artiach et al., 2010).

Governments have modified their approach to sustainability matters. They moved from favoring CSR to let companies address government deficits to a new vision of complementarity between public services and private CSR commitments. Soft legislation to encourage CSR has become common (Moon and Vogel, 2008). CSR activities required by law have however a weak impact on value creation, compared to voluntary CSR engagement (Attig et al., 2014). According to Kramer and Porter (2011) regulations can enhance CSR only if they meet some conditions:

- They define a measurable objective (e.g. energy consumption).
- They do not impose any method to reach the mandatory standards. Corporations can better judge the less costly way to conform.
- They include phase-in periods to give firms the time consider the situation and adapt efficiently.
- They mandate a universal performance measurement system.
- They require businesses to report to governments their performance.
- They limit firms' opportunistic and exploitative behavior.

2.4 CASH HOLDINGS AND CSR

Academics have traditionally neglected the investigation of the relationship between CSR and cash. Cash has been used generally (at best) as a control variable in studies focused in the financial effects of CSR. For example, Artiach et al. (2010) and Gainet (2010) found no relationship between the cash/total assets and CSR scores.

To the best of my knowledge, only three scientific publications on the topic exist: Arouri and Pijourlet (2015), Cheung (2016), and Lu et al. (2017).

Arouri and Pijourlet (2015) researched the impact of CSR on the value of cash holdings. Two alternative hypotheses on the relationship between CSR and cash value are possible:

- 1) Agency view of CSR: managers use CSR activities to obtain private benefits. More cash translates in greater resource misallocation by managers who want to increase their power in the firms.
- 2) Conflict-resolution view of CSR: managers use CSR activities to reduce conflicts with stakeholders. Since investors assign a lower value to cash holdings when entrenched managers can extract private benefits from this cash (when agency costs are high), the net effect is that CSR increases the value of corporate cash holdings.

The authors found support for the conflict-resolution view, but only in countries with strong investor protection. In this case the good management mechanism is verified. If investor protection is weak, shareholders suppose instead that managers use CSR activities for their own sake, and thus assign a lower value to cash holdings. The result still holds true when accounting for endogeneity (*“It is possible that the level of excess cash has an influence on CSR performance: firms with high value of cash holdings may invest more in CSR”* [the slack resource mechanism], Arouri and Pijourlet, 2015, p. 10, note 1), but was criticized by Cheung (2016) for, among other things, not controlling for corporate governance.

Cheung (2016) identified three possible channels through which CSR can influence the level (not value) of cash holdings:

- 1) Idiosyncratic risk: CSR creates social capital by improving the relationship with stakeholders. CSR engaging firms do not need to keep high level of cash holdings to be protected by negative events. This channel is the equivalent of the insurance mechanism in the CSR-financial performance literature and relies on the precautionary motive for cash holdings.
- 2) Systematic risk: CSR creates brand loyalty. The effect is an inelastic demand which reduces the systematic risk of sustainable companies. CSR firms may either reduce

their cash reserves thanks to the lower systematic risk or they can increase the size of the treasury because of the higher refinancing risk (a lower systematic risk is generally associated with a shorter debt maturity structure).

- 3) Corporate governance: if CSR strengthen corporate governance it should reduce agency problems. In this case, businesses need a lower level of cash. On the other hand, managers may use CSR activities to obtain private benefits by colluding with specific stakeholders. They may keep more cash in their company to extract it later.

The corporate governance channel is an application of the agency motive to hold cash. He found empirical evidence of a strong and statistical significant (indirect) relationship of cash holdings and CSR, but only through the systematic risk channel. The evidence on the other two channels was mixed and not sufficiently robust.

Lu et al. (2017) examined the relationship between CSR reports and the value of cash holdings. They argued that CSR disclosure is a monitoring tool for shareholders. CSR reports provide additional information on a firm future projects. They help in assessing corporate costs and profitability even though they contain only extra-financial information. The reduction of information asymmetry makes harder for managers to misappropriate corporate resources. Consequently, the cash of firms which advertise their CSR involvement is valued higher than the treasury of their non-CSR disclosing competitors. This effect is stronger for firms operating in less transparent markets and with weak external control.

Furthermore, the issuance of voluntary CSR reports is associated with a slower dissipation of cash holdings (but the opposite is not true: CSR reporting companies do not accumulate more cash than non-reporting enterprises) and a use of cash that improves more future operating performance. The reason is that managers are more constrained in using cash for their own personal benefits.

It's surprising that the conclusions of Arouri and Pijourlet (2015) and Lu et al. (2017) overlap. Voluntary CSR disclosure isn't necessarily associated with better CSR performance (or we should take for granted the transparent reporting hypothesis of Kim et al., 2012). Bad CSR performing firms may provide more non-mandatory information than sustainable companies. A possible explanation was given by Gutsche et al. (2016): CSR reports always convey a favorable image of businesses. Non-sustainable firms tend to provide self-descriptions which are too complex for investors to properly evaluate. Voluntary disclosure is too often misinterpreted as better CSR performance by shareholders.

2.5 RESEARCH HYPOTHESES

The objective of this study is to identify if a relationship between foreign cash holdings and CSR performance exists and if it is statistically significant - that is, the relationship isn't exclusive to the sample used and can be generalized to the whole population.

A fundamental issue in developing hypotheses is the lack of a directly comparable scientific publications covering the relationship between foreign cash holdings and CSR. The hypotheses are based on the broader cash holdings and CSR literature, since a specific literature does not exist.

I expected CSR performances to be negatively associated with foreign cash holdings. As discussed above, CSR can facilitate access to market (Cheng et al., 2014), decrease the cost of equity and debt (Kim et al., 2014), reduce the sensitivity of investments' expenditures to the availability of internal resources (Attig et al., 2014), increase the loyalty of customers (Cheung, 2016) ... Overall, CSR could provide benefits which reduce both the transaction and the precautionary motive to hold cash. Firms do not need to keep a high level of liquidity if they can obtain capital at low cost. They also could reduce precautionary cash holdings since investors are willing to provide funds whenever an investment opportunity arise, providing that CSR reduces investor's expectations on the riskiness of the business. Multinational firms, which are exposed to several different regulations (Bajo and Duran, 2014), could commit to CSR activities to reduce the political scrutiny on their operations. In this case, their foreign subsidiaries would need lower cash holdings to cope with external pressures. Thus, the first research hypothesis is the following:

H1: Firms with high CSR scores tend to hoard less cash in their foreign subsidiaries.

H1 can also be derived by a tax motive perspective (Foley et al., 2007). It is true that CSR begins where the law ends (Davis, 1960), but CSR intrinsically includes also legal responsibilities (Carroll 1979; 1991). It is reasonable to expect enterprises with a strong CSR commitment to avoid tax optimization practices. But from accounting reports it is possible to obtain information only on foreign cash, not on trapped cash. Since foreign cash and trapped cash are two separate concepts (Laplante and Nesbitt, 2017), this kind of analysis yields only limited results. The outcome could even be misleading.

Furthermore, CSR can significantly reduce the information asymmetry between a firm and its stakeholders and operate as a risk management tool (Artiach et al., 2010). However, if managers are not controlled efficiently, they could stockpile cash to be less reliant on capital markets and to increase their personal power (Jensen, 1986). Hoarding cash abroad can

increase the expropriation risk if a specific corporate governance structure isn't used to mitigate the possibility of limited resources' misappropriation (Beuselink and Du, 2017). On the other hand, managers of poorly governed firms may dissipate cash sooner or prefer to invest today to increase their current, not future, power (Dittmar and Mahrt-Smith, 2007; Harford, 2008). In the debate on the relevance of the free cash flow theory (or similar theories such as constrained liquidity theories, risk aversion hypothesis, etc.) or the spending hypothesis, I tested the first perspective by formulating the following hypothesis:

H2: A strong corporate governance increases the effect of CSR on foreign cash holdings.

Note that the testing of this second hypothesis relied on the assumption of a (more or less) homogeneous corporate governance quality across the various geographical divisions of a company. The corporate governance is valued for the whole company, not for single subsidiaries. If the foreign subsidiaries of a firm have significantly different quality of corporate governance, every consideration made regarding the effect of corporate governance on the relationship between foreign cash holdings and CSR is not trustworthy. It is likely that the strength of the corporate governance of the foreign subsidiaries, not only of the parent company, influences foreign cash holdings. A direct relationship between the quality of the corporate governance of the parent company and of the foreign subsidiaries is needed.

3. DATA

This chapter presents first the sample and how it was obtained. Secondly, the variables used to test the research hypotheses and their basic features are introduced. Finally, the correlation matrix is provided.

3.1 SAMPLE

The sample consisted of companies included in Standard and Poor's 500 index (S&P500) which disclosed cash holdings of foreign subsidiaries in 2014, 2015 and 2016 and for which Thomson Reuters Asset4 provided the environmental, social and governance scores.

The number of firm-year observations for which all these values were available is 620. The number of individual firms were 243.

FOREIGN CASH HOLDINGS

The values of foreign cash holdings were hand-collected from the 2014, 2015 and 2016 annual reports.

The variable used in the study was the percentage of foreign cash on total cash. The absolute value of foreign cash holdings could not be used because companies report different measures of liquidity. Reported foreign cash can be: cash, cash and cash equivalents, cash and cash equivalents and marketable securities, cash and cash equivalents and short-term and long-term investments... The reported foreign cash was computed as a fraction of the comparable consolidated measure of liquidity, to obtain a homogeneous indicator of foreign cash.

Although the Securities and Exchange Commission (SEC) began to require additional information on foreign subsidiaries' cash holdings in 2011, less than half of the firms in the S&P500 provided this information in the period analyzed. This fact is consistent with Faulkender et al. (2017). However, it must be noted that several firms that did not provide the related disclosure in the Form 10-k, did it in their annual report. For this reason, I always checked the annual report.

The lack of a specific Financial Accounting Standard Board (FASB) accounting principle leaves corporations free to disclose or not foreign cash holdings. When they do, their disclosure is inconsistent not only on the measure of foreign liquidity, but also on the section of the Annual Report where this piece of information can be found. Most companies in the sample disclosed cash held abroad in the "Liquidity and Capital Resources" section of the Management Discussion and Analysis (MD&A). Other firms reported foreign cash in the introduction ("Business Overview"), segment reporting, tax income section (foreign cash was

disclosed in association with unremitted earnings of foreign subsidiaries), foreign currency risk section, interest rate risk section, ... A few businesses reported the information in other parts of the annual report, without a comprehensible rationale (for example, Blackrock disclosed that approximately 50% of its cash is kept by non-U.S. subsidiaries in a barely readable note below an unrelated table). Sometimes, a company reported the consolidated balance sheets of foreign subsidiaries. Cash holdings was then computed as the sum of cash holdings of all foreign subsidiaries (and then divided by the consolidated group cash holdings to obtain the percentage of foreign cash). Obviously, if the parent company did not own 100% of the foreign subsidiary, only the cash associated with the ownership share was computed (for example, Wynn Limited Resorts owns 72% of Wynn Macau, Limited; only 72% of the cash attributable to Wynn Macau, Limited and its subsidiaries was counted as foreign cash of the parent company).

A further issue is that the disclosure of foreign cash holdings was not always precise. When a firm reported the value of foreign cash it was often grossly approximated. Dividing this value with more precise data found in the balance sheet has surely led to inconsistencies, which in the worst cases I reckon of nearly 1%. Moreover, even if a firm disclosed the percentage of foreign cash, this value was generally approximated to exclude decimal points. It's easy to figure out how this fact can distort the dependent variable used in this work. There's nearly a one point difference between 39,6% and 40,4%. Nevertheless, both percentages would be reported as 40%. If this margin of error is present in hundreds of observations, the significance of the foreign cash variable is greatly lowered.

Even worse, a few companies did not provide a number to quantify their foreign cash. I made three different types of assumption in these situations:

- 1) Expressions such as “practically all of our cash is held abroad” were translated in a 100% percentage of foreign cash holdings.
- 2) When a firm reported the like of “approximately half of our liquidity is attributable to subsidiaries in foreign jurisdictions”, I assumed a 50% ratio (but what does approximately mean exactly? 45%? 57%?).
- 3) If an annual report affirmed that “foreign cash holdings are immaterial in the context of our consolidated liquidity” or similar, I attributed a 0% value to the foreign cash variable.

Observations were dropped if the company simply reported something akin “the majority of our cash is held abroad”. The “majority” concept is too broad to quantify (51% surely qualifies as majority, but I’d argue that it is significantly different from 85%).

The last assumption I made was attributing all cash held “within foreign bank accounts” to foreign subsidiaries. Although this may seem a reasonable conjecture, it may very well be that this liquidity is instead attributable to foreign branches, and as such it is freely transferable to the parent company. The result may be biased especially if we assume true the tax motive to hold cash. Regarding this motive, I should highlight that the foreign cash used in the work is the whole foreign cash. Some firms disclosed how much foreign cash is considered permanently reinvested abroad. The remaining foreign cash is likely to be repatriated in the next years (and several companies did already repatriate cash holdings associated with foreign earnings from 2014 to 2016). I decided not to use only the foreign cash permanently reinvested in foreign jurisdictions after taking into account two elements:

- 1) Considering only permanently reinvested cash makes sense nearly exclusively by the tax motive perspective. But academics, as shown above in the literature review, have found multiple reasons to hold cash.
- 2) The foreign cash variable would not be homogeneous. Most firms did not disclose how much cash was considered permanently reinvested. The variable would include a few observations of permanently reinvested cash and many calculations of total foreign cash.

Overall, the foreign cash variable cannot be considered completely trustworthy. I did what I think is the best to construct the variable. But there’s no remedy to a lack of detailed information. The margin of error should not be huge (most likely less than 1%), but still annoying given that the dependent variable is an accounting measure.

ASSET4 SCORES

Thomson Reuters Asset4 was used to collect measures of CSR performance. Several studies already referred to this database for CSR ratings (e.g. Chen et al., 2014; Shaukat et al., 2016).

Thomson Reuters Asset4 categorizes corporate performances in 4 pillars: economic, environmental, social and corporate governance. The first pillar wasn’t of interest for this study: different economic indicators were used. Only the environmental, social and corporate governance (ESG) performances were used.

Thomson Reuters collects more than 750 data points for each company using only publicly available sources. The data points are then elaborated to obtain more than 280 key performance indicators (KPIs). The KPIs range from zero to one. A value of one signals the best possible performance or one alternative outcome of a binary variable. Every KPI belongs to a specific category out of 18.

For the three ESG pillars, Thomson Reuters collects more than 400 data points to compute more than 70 KPIs which determine 10 categories. The ESG scores are then computed by weighting the performance in each category of a specific pillar. For example, the environmental performance consists of three categories: resource reduction, emission reduction and product innovation. The weights are assigned to each category according to analyses of the data distributions (e.g. KPIs reported by less than 20% of companies are weighted less). Firms which do not report a KPI are assigned a value equal to the worst reported measure of that KPI. The pillars' ratings also range from zero to one.

Moreover, Asset4 ratings are normalized by Thomson Reuters. This increase what represents the main advantage of using CSR ratings provided by an external agency: the possibility to compare firms based on the same elements.

The value of the ESG pillars were copied out by hand from each company ESG scores chart for every year in the 2014-2016 period in which the company disclosed foreign cash holdings⁴⁵.

Afterwards, the ESG controversy ratings for each company were exported. According to Thomson Reuters' definition it is a category which "*measures a company's exposure to environmental, social and governance controversies and negative events reflected in global media*". It can be considered a measure of Corporate Social Irresponsibility (CSI; see the discussion on the penance and insurance mechanisms of CSR in chapter 2.2).

In the sample, one observation of the corporate governance rating and 3 observations of the controversy category were missing. The CSR score used in the study is the average of the environmental and social score. I followed Davis et al. (2015) in controlling separately for the corporate governance. First, I used the median of the corporate governance score to determine a subsample to verify whether the foreign cash holdings-CSR relationship changes according

⁴⁵ I used the Thomson Reuters Eikon account subscription of the Department of Economics and Management of the University of Padua. Since the Department subscription does not include the ESG optional package there was no alternative to copying by hand the data needed for this study. You can export in an Excel spreadsheet the overall Asset4 rating and the value of some the indicators for each company covered by Asset4. But surprisingly, you can't export the score of each pillar.

to the quality of the corporate governance. Second, I directly inserted in the regression the governance rating and its interaction with the CSR score I created.

There are some caveats to this approach.

As already pointed out by Aupperle et al. (1985), there is no right way to measure CSR. Every CSR rating agency scoring methodology contains numerous subjective assessments (even though Thomson Reuters swears that its ESG data is “*in-depth, objective and comparable*”).

To use the words of Manescu (2010, p. 62):

“a wide range of issues are addressed simultaneously in an assessment of a firm’s social responsibility. However, there might be differences in the way these issues affect different businesses. Some dimensions are certainly important for some businesses, while others are less relevant [...] Different CSR dimensions imply different costs and might provide different benefits and opportunities for profit depending on the nature of the firm’s core business. Thus, it is difficult to construct an aggregate measure of CSR in a fair manner, even if accurate information about the achievements in terms of each particular dimension is available. One has to decide on a set of weights to be used for computing an aggregate index. Depending on the structure of the weighting system, more emphasis might be placed on some dimensions and less on others. This subjective way of computing CSR indices is prone to criticism, as it might favor some dimensions over others and therefore some companies over others.”

The ESG ratings assigned by Thomson Reuters are affected by two general conjectures:

- Fungibility between categories: a good performance in one category can rarely compensate a bad score in another one (“*If you lie with your head in the oven and your feet in the fridge, on average you’ll be comfortably warm*”; Capelle-Blancard and Petit, 2015, p.5).
- Commensurability between categories: to calculate the overall value of a pillar, each of the 10 categories is given a certain weight whose determination process is completely subjective.

The distribution based weighting system used for Asset4 is reported in Table 1. Even if we consider those weights flawless, applying the same weight to the environmental and social score when creating a CSR variable (as I did, and as is generally done by most scientific publications using composite CSR scores) is far from optimal. The assumption here is that these two criteria are equally important.

Pillar	Category	Indicators in Scoring	Weights
Environmental	Resource Use	20	11%
	Emissions	22	12%
	Innovation	19	11%
Social	Workforce	29	16%
	Human Rights	8	4.50%
	Community	14	8%
	Product Responsibility	12	7%
Governance	Management	34	19%
	Shareholders	12	7%
	CSR Strategy	8	4.50%
TOTAL		178	100%

Table 1: The weights (far right column) assigned by Asset4 to each category.

Source: Thomson Reuters ESG Scores. March 2017⁴⁶.

Capelle-Blancard and Petit (2015) tried to create weights which reflect the level of social concern by dividing the number of articles on a dimension of CSR by the total number of CSR news items. Their results are reported in Table 2.

To address the issue of wrongly specified weights, I used Capelle-Blanchard and Petit weights in a robustness test. Beware that it is still debatable to use weights for each pillar proportional to the public scrutiny applied to it. It is still an assumption.

Another minor problem is related specifically to Asset4. Thomson Reuters updates the ratings on a bi-weekly basis. They are based predominantly on past data (information found in annual reports, non-governmental organizations' websites, sustainability reports), but some KPIs are based on data points connected with some present-day phenomenon⁴⁷. From time to time the historical Asset4 scores will change. In theory, this shouldn't constitute an issue because I copied the ESG scores in the same period. But I'm not 100% sure that all data points are updated at the same time by Thomson Reuters.

⁴⁶ Available at:

<https://financial.thomsonreuters.com/content/dam/openweb/documents/pdf/financial/esg-scores-methodology.pdf>

⁴⁷ This is a personal assumption. I couldn't find a list of all KPIs used by Asset4. But this hypothesis isn't unreasonable considering the otherwise unexplainable variations in the historical CSR ratings provided by Asset4 from time to time. Between March and September 2017, I took by hand the same ESG scores 5 times and they were always different (generally by a few decimals, but still). This study uses the latest ESG scores copied in September.

	Environ.		Social			Govern.
	ENV	COM	HUM	EMP+DIV	PRO	CGOV
Panel A: Concerns						
<i>Media scrutiny</i>						
Banks	7%	17%	10%	32%	10%	24%
Basic Resources	34%	18%	10%	15%	6%	16%
Chemicals	35%	13%	4%	10%	27%	11%
Consumer G&S	12%	12%	5%	32%	26%	13%
Industrial goods	18%	11%	4%	46%	9%	13%
Technology	14%	8%	11%	38%	9%	21%
<i>All sectors</i>	<i>20%</i>	<i>13%</i>	<i>8%</i>	<i>29%</i>	<i>14%</i>	<i>16%</i>
<i>NGO scrutiny</i>						
Banks	30%	14%	16%	9%	13%	19%
Basic Resources	36%	18%	20%	7%	6%	13%
Chemicals	32%	13%	7%	8%	24%	15%
Consumer G&S	14%	12%	9%	26%	23%	17%
Industrial goods	24%	14%	12%	31%	2%	17%
Technology	24%	8%	22%	24%	10%	13%
<i>All sectors</i>	<i>26%</i>	<i>14%</i>	<i>14%</i>	<i>16%</i>	<i>14%</i>	<i>15%</i>
Panel B: Strengths						
<i>Media scrutiny</i>						
Banks	24%	36%	4%	15%	13%	9%
Basic Resources	31%	32%	3%	11%	9%	13%
Chemicals	37%	23%	3%	8%	16%	14%
Consumer G&S	32%	25%	3%	14%	18%	8%
Industrial goods	53%	15%	1%	8%	11%	12%
Technology	41%	20%	3%	8%	15%	12%
<i>All sectors</i>	<i>36%</i>	<i>24%</i>	<i>3%</i>	<i>11%</i>	<i>15%</i>	<i>11%</i>
<i>NGO scrutiny</i>						
Banks	28%	24%	7%	17%	16%	8%
Basic Resources	30%	23%	10%	12%	12%	12%
Chemicals	33%	25%	4%	10%	16%	12%
Consumer G&S	29%	19%	7%	22%	14%	8%
Industrial goods	38%	19%	5%	21%	9%	9%
Technology	37%	22%	5%	14%	13%	10%
<i>All sectors</i>	<i>30%</i>	<i>23%</i>	<i>6%</i>	<i>16%</i>	<i>15%</i>	<i>10%</i>

Legend

ENV = environment	COM = community
HUM = human rights	EMP+DIV = employees/diversity
PRO = products/customers	CGOV = corporate governance

Table 2: Weighting schemes, by sector.

Source: Capelle-Blancard and Petit, 2015.

CONTROL VARIABLES

I followed the 1999 Opler-Pinkowitz-Stulz-Williamson (OPWS) model, which is by far the most used regression model in the cash holdings literature (Weidemann, 2017). Clearly, the dependent variable is not the level of corporate cash holdings nor the liquidity ratio of the balance sheet (cash and equivalents/total assets), but the percentage of foreign cash holdings on total cash holdings.

I used Thomson Reuters Eikon to retrieve the needed data. When pieces of information were missing, I hand collected them from the annual reports of the companies in the sample. All monetary values were in dollars.

The control variables directly taken from OPWS are:

- Natural logarithm of total assets. It is a measure of firm size. The natural logarithm transformation is used to reduce the mean absolute deviation, which is significant in similar samples, and to obtain a variable with a Gaussian distribution.
- Total debt/total assets. This is a measure of leverage. Total debt is short-term debt plus long-term debt. I used total assets as scaling factor, as performed by Bates and al. (2009), instead of the net assets (total assets minus total liabilities) used by Opler et al. (2009). However, I used total assets as scaling factor in a robustness test to verify if the regression result is modified (the name of this last variable is *tdnas*).
- Price-to-book ratio. It is market value of equity divided by book value of equity. It measures how much investors value a company's equity compared to its accounting value. The more valuable a firm's unaccounted assets are (human capital, brands, customer relationship...), the higher the price-to-book ratio generally is. When I couldn't find the market value of equity, I multiplied the closing price of the stock at the annual report closing day (taken from MarketWatch.com) by the number of shares outstanding (disclosed in the Form 10-K). In the denominator, I excluded minority shareholders' interests in consolidated companies. For this reason, the book value of equity used here slightly differs from the net asset used as scaling factor for several variables. The price-to-book ratio can be also considered a gross approximation of the Tobin's Q ratio, which assumes a value greater (lower) than 1 if the company is earning at a rate higher (lower) than the replacement costs of its assets. In the pecking order theory, the price-to-book ratio is a measure of investment opportunity (Baker and Wurgler, 2002). In a robustness test, I used the price-to-sales ratio, computed as market value of equity on revenues, to check if the regression result is modified when

taking into consideration a metrics which is more robust to distressed situations. Both the price-to-book ratio and the price-to-sales ratio are used as a proxy of future growth prospects.

- (Net working capital-total cash)/net assets. Net working capital is the operating liquidity available to businesses. Along with fixed assets such as plant and equipment, working capital is considered a part of operating capital. It is computed as current assets minus current liabilities. The variable was not included as a measure of financial health and efficiency, but as an index of the availability of liquid asset substitutes. To fill the model, for three financial companies (American International Group, Principal Financial Group and Unum Group) the net working capital was computed even though there wasn't a balance sheets classification of current and noncurrent assets and liabilities. The assumptions I used were:
 - 1) current assets = cash and cash equivalents, short-term investments and net receivables.
 - 2) current liabilities = accounts payable, short-term debt and current portion of long-term debt.

There's no way to be completely sure that the net working capital calculated for these three companies was correct. In a robustness test, I used (net working capital-foreign cash)/net assets, which identifies substitutes of foreign cash (not of consolidated cash).

- Capital expenditure/total assets. It is a measure of investment activities. It represents how much a company invested to purchase fixed assets, to acquire intangibles and to develop software.
- Research and development expenses/sales. It is a proxy of financial distress costs. When no R&D spending was reported, I set the value of R&D to zero, following Opler et al. (1999). However, hypothesizing that firms not disclosing R&D expenses do not actually spend anything in R&D is a strong assumption. Nonetheless, I speculated so since this argument is used in practically all the cash holdings research.
- Thomson Reuters Asset4 Governance pillar rating. Opler et al. (1999) included two indicators of corporate governance (percentage of insider ownership and dummy variable indicating the presence anti-takeover measures). Corporate governance indicators were not used by all subsequent studies. However, I needed a measure of corporate governance to test H2. I used the Asset4 rating because it is a composite score and because it is constructed according to the same principles used to score the environmental and social performances used to build the CSR explanatory variable.

- 5-year standard deviation of free cash flow. This variable shows the riskiness of a firm business. OPWS models generally use up to 20-year standard deviations, when available in databases. Since I hand-constructed this variable, I considered only a 5-year timespan. The free cash flow was computed using cash flows statements from 2010 to 2016 (free cash flow = cash flow from operation – capital expenditure). There were two problematic firms:
 - 1) Paypal was spun-off from Ebay in 2015. Deconsolidated cash flow statements for Paypal are available since 2012. But Paypal 5-year free cash flow volatility was needed for 2015 (meaning that also the 2011 free cash flow was necessary). I used the 2016 measure as a substitute of the 2015 one.
 - 2) Qorvo was constituted in 2015 through the merger of TriQuint Semiconductor and RF Micro Devices. I computed the free cash flows before the merger as the sum of the free cash flows of TriQuint Semiconductor and RF Micro Devices in the same year.

These approximations should not create issues.

- Dividends. They are captured by a dummy (1 if dividends were distributed, 0 otherwise). In a robustness test I used alternatively the 5-year average payout ratio (dividends distributed on net income), to control if a medium-term dividend policy can better explain foreign cash holdings than what the current year dividend policy does.

Other variables used in the regression are not present in the OPWS models:

- CSR rating. The explanatory variable, it is the average of the environmental and social scores. CSR as independent variable in a cash holdings regression was already used by Cheung (2016).
- ROA. Return on assets is a widely used measure of profitability in the CSR literature. It is calculated by dividing a company's net income, prior to financing cost, by total assets. But in the cash holdings research, academics prefer to use free cash flow on net assets. I chose ROA because it can control for differences in CSR performances (e.g. slack resource mechanism), whereas the relationship between CSR and free cash flow is not established. However, I employed free cash flow on net assets and ROTA (earnings before interests and taxes on net assets) in some robustness tests. I alternatively inserted ROE, because return on equity can have a stronger relationship with CSR than ROA (Artiach et al., 2010; Dumitrescu and Simionescu, 2015). Return on equity is computed as net income on total equity.

- Foreign sales/total sales. It is a proxy of the size of foreign operations. The percentage of revenues attributable to foreign subsidiaries is extremely relevant. One expects companies with more foreign sales to hold more cash abroad. Not controlling for foreign sales would result in an incorrectly specified model. Foreign sales/total sales are commonly used in cash holdings studies focusing on multinational firms (Fernandes and Gonenc, 2016). Unluckily, not all firms reported sales outside the domestic market. For a few missing observations, I used sale outside North America: for the other companies in the sample Canadian revenues represented less than 1-2% of consolidated sales, so North American sales should not be much different from U.S. sales. Other firms instead did not even report sales in North America. A part of these corporations reported only on a continental basis (the Americas were the smallest segment available), whereas others did not provide any geographical breakdown. In these two situations, I filled the missing values only if it was possible to reasonably estimate foreign sales using other pieces of information in the annual reports. For example, I computed Advance Auto Parts foreign sales by dividing revenues by the number of stores and then multiplying the (supposed) annual sales per store for the number of stores owned abroad. Even here, the assumptions were strong (in the Advance Auto Parts case, it's likely that sales are proportional to the GDP per capita of the area in which a store is located even if the stores use the same format and the square meters per store are fairly similar), but they were made only for very few companies in the sample, avoiding the loss of some observations. Ultimately, 20 observations were still missing. The sample had a size of 600 (=620-20) whenever foreign sales were included in the regression. Two possible alternative measures of foreign operations are foreign assets and foreign earnings. But foreign assets are reported only by a small fraction of the firms in the sample. The resulting regression would not be representative. Foreign earnings, instead, can be altered using earning management techniques (especially through accruals). Since the sample comprises observations from only 3 years, the effect of income shifting in time is not neutral.

One variable used in OPWS models is missing in the regression: the industry-specific standard deviation of free cash flow. Cash holdings' studies generally estimate the riskiness of a business considering not only the volatility of its free cash flow (which I included in the model), but also the average volatility of the free cash flow in its industry, based on the sample. I decided not to use this measure because the sample is too small, and the free cash flow in several industries would be determined as the average of a very few observations.

Moreover, using firm-level instead of industry level volatility generally yields similar results (Dittmar and Duchin, 2010).

I constructed 9 dummy variables which assumed value 1 if a firm was classified as operating in one of the sectors defined by the Global Industry Classification Standard (GICS). The sectors included in the regression were: Energy, Materials, Industrials, Consumer Discretionary, Consumer Staples, Health Care, Financials, Information Technology and Utilities. The baseline model (when all GICS dummies were equal to zero) assumed that the company operated in the Telecommunication Services or in the Real Estate sector⁴⁸. I also generated two dummy variables to control respectively for the year 2015 and 2016. The baseline model was set at year 2014. Errors were clustered at the firm level to address heteroskedasticity and autocorrelation issues. Table 3 summarizes the sample, by year and GICS sector.

	2014	2015	2016	Total	% total
Energy	9	10	8	27	4%
Materials	14	17	13	44	7%
Industrials	40	40	28	108	17%
Consumer Discretionary	39	39	28	106	17%
Consumer Staples	21	23	13	57	9%
Health Care	34	33	23	90	15%
Financials	14	14	9	37	6%
Information Technology	54	54	24	132	21%
Telecommunication Services	1	2	0	3	0,5%
Utilities	3	3	2	8	1%
Real Estate	3	3	2	8	1%
Total	232	238	150	620	100%
% total	37%	38%	24%	100%	

Allow for rounding errors.

Table 3: Distribution of the sample's observations, by year and GICS sector.

It is also interesting to know how many observations are related to companies operating in CSR sensitive industries. CSR sensitive industries include sinful industries (alcohol, tobacco and gambling) and several other industries whose business is controversial because it is exposed to emerging environmental, social, or ethical issues (defense-related weapons, nuclear, oil, biotech...). I followed the CSR sensitive industries classification which can be found in the literature (Hong and Kacperczyk, 2009; Cai et al., 2012). The Standard Industrial

⁴⁸ There are 11 GICS sectors. But the regression included only 9, not 10, dummies because the Telecommunication Services and Real Estate dummies are a linear combination of the other explanatory variables when 10 GICS sector dummies are in the model. To avoid multicollinearity, both dummies had to be excluded.

Classification (SIC) and North American Industry Classification System (NAICS) codes are used to identify industries. My classification has two small tweaks (see Table 4):

- I added the whole coal industry (not considered in the literature) because NAICS 324 (Petroleum & Coal Products Manufacturing) was considered an environmentally sensitive industry by the U.S. Small Business Administration (SBA) in 2007⁴⁹. In any case, no firm in the sample operates in this industry.
- I extended the Alcohol industry also to the SIC code 2086 “Bottled and Canned Soft Drinks and Carbonated Waters”. The literature considers only the 2080-2085 SIC codes. One firm in the sample, Monster Beverage, has a 2086 SIC code. I believe Monster Beverage should be considered as operating in a CSR sensitive industry because energy drinks have been severely criticized for their negative impact on human health. After all, the classification found in the literature acknowledges that Dr. Pepper Snapple Group, The Coca-Cola Company and PepsiCo (3 companies in the sample) make business in a CSR sensitive industry.

Overall, 53 firm-year observations (less than 9% of the sample) are related to CSR sensitive industries.

The regression model used to test H1 was:

$$\begin{aligned} \frac{\text{Foreign cash}}{\text{Total cash}} = & \beta_0 + \beta_1 \text{CSR} + \beta_2 \frac{\text{Foreign sales}}{\text{Total sales}} + \beta_3 \text{ROA} + \beta_4 \ln(\text{Total assets}) + \beta_5 \frac{\text{Total debt}}{\text{Net assets}} + \\ & \beta_6 \frac{\text{Market value of equity}}{\text{Book value of equity}} + \beta_7 \frac{\text{Net working capital}-\text{Total cash}}{\text{Net assets}} + \beta_8 \frac{\text{Capital expenditures}}{\text{Total assets}} + \beta_9 \frac{\text{R\&D expenses}}{\text{Total sales}} + \\ & \beta_{10}(\text{5-year free cash flow standard deviation}) + \beta_{11} (\text{Dividend dummy}) + \beta_{12} (\text{Sector dummy 1}) + \\ & \beta_{13} (\text{Sector dummy 2}) + \dots + \beta_{19}(\text{Sector dummy 9}) + \beta_{20}(\text{2015 year dummy}) + \\ & \beta_{21}(\text{2016 year dummy}) \end{aligned}$$

with $\text{CSR} = 0.5 * \text{Environmental score} + 0.5 * \text{Social score}$

I set α equal to 0.05. When testing H2, the governance score and its interaction with CSR (equal to $\text{CSR} * \text{governance score}$) were included in the model. A personal critic to academics is that, when controlling for governance (usually by using more than one variable, especially in case of dummy variables), they generally do not separate the corporate governance dimension from their composite measure of CSR. That is, they add collinearity in the model because corporate governance is already accounted in the ESG rating.

⁴⁹ The 2007 U.S SBA classification can be found online at:
http://nwbusiness.org/listing_of_naics_codes.ydev

CSR sensitive industry	Identification method
Coal/lignite mining	SIC codes: 1200-1299
Tobacco	SIC codes 2100–2199
Alcohol	SIC codes 2080–2086
Gambling	NAICS codes 7132, 71312, 713120, 71329, 713290, 72112, 721120
Military	SIC codes 3760–3769, 3795, 3480–3489
Firearms	NAICS codes 332992–332994
Nuclear energy	NAICS code 221113
Cement	SIC codes 3240–3241
Oil	SIC codes 1300, 1310–1339, 1370–1382, 1389, 2900–2912, 2990–2999
Biotech	SIC codes 2833–2836

Table 4: CSR sensitive industries⁵⁰.

All continuous independent variables were winsorized at the 1st and 99th percentiles.

Winsorization is a statistical procedure which substitutes the extreme values of a variable (in this case, values in the lower or upper 1% of the distribution) with the values of the closest allowed percentile (1st and 99th percentiles). Winsorizing is performed to reduce the influence of outliers (Attig et al., 2014) and obtain robust estimators. The suffix “_w” shows that a variable has been winsorized.

ENDOGENEITY

A typical problem identified in the CSR literature is endogeneity. The CSR variable may be correlated with the error term. Since the error term comprises all factors not included in the model, the likelihood of the CSR variable being endogenous is high. The root of the problem lies in the fact that firms’ strategic decisions are based on some corporate factors which can hardly be observed from outside the companies, but are very well known by managers. Not considering endogeneity when using CSR scores as explanatory variables may generate misleading results, sometimes even opposed to what is obtained when endogeneity is correctly accounted (Ariño et al., 2010). Using instrumental variables allegedly produces more consistent estimates, but at the cost of efficiency. The standard errors are larger than

⁵⁰ In the gambling industry, I manually added Wynn Resorts Limited because its NAICS code does not show this component of its activities (Wynn Resorts Limited is primarily a high-end hotel chain). In the nuclear energy sector, I manually added Duke Energy Corporation and General Electric, since they manage nuclear plants, but it isn’t indicated by their NAICS codes.

what obtained in a simple Ordinary Least Squares multiple linear regression (Wooldridge, 2002). The adjusted R^2 is always lower when an endogenous variable is instrumented.

I used a Two-Stages Least Squares (2SLS) regression and instrumented the CSR variable by means of a specific instrument used in the literature: the “blue state”. Academics have found that companies headquartered in U.S. states which vote mainly for democratic candidates are more CSR oriented. It’s possible to use the voting attitude of firms’ states to instrument the CSR variable.

I used this instrument because it is correlated with the CSR attitude of businesses and most likely it does not influence foreign cash holdings. In the literature, this instrument variable has taken 2 forms: a dummy variable (Cheung, 2016) - 1 for a blue state, 0 for a red state, or vice versa - or a score computed on various element of the political environment (Albuquerque et al., 2016).

I prefer the second approach: a dummy variable conveys less information. A state in which 70% of the population votes for the Republican Party is significantly different from a state in which the Republican Party has only a 1% advantage over the Democratic Party (51%-49% split). Nonetheless, a dummy variable accounts for these two situations in exactly the same way.

I used the average of the percentage of votes received in each state by the democratic candidate for the latest 5 presidential elections. Some companies in the sample are headquartered in the United Kingdom (Aon Plc 2014-16; Delphi Automotive 2015 and 2016; Mylan N.V. 2014⁵¹) or in Ireland (Allegion 2014, 2015; Medtronic 2014 and 2015; Seagate Technology 2014 and 2015). For these firms, the blue state variable is calculated assuming all left-wing political parties of the country as equivalent to the U.S. Democratic Party. Only parties which received at least 1% of the votes during a general election or 0.1% of the votes in at least 2 of the 5 latest general elections were considered. The selection process was designed to avoid collecting data on dozens of micro-parties which considered together probably increase the average by less than 0.1% (if any).

Tables 5, 6 and 7 exhibit the values attributed to the blue state variable.

⁵¹ Mylan N.V. is headquartered in Pennsylvania, but its principal executive offices are in U.K. Since the culture of the place where the managers live is probably what influences most the CSR performance through the blue state variable, I considered Mylan N.V. as a U.K. company.

U.S. state	2000	2004	2008	2012	2016	Average
Alabama	41,60%	36,80%	38,70%	38,40%	34,40%	37,98%
Arizona	44,70%	44,40%	45,10%	44,60%	45,10%	44,78%
Arkansas	45,90%	44,50%	38,90%	36,90%	33,70%	39,98%
California	53,40%	54,30%	61,00%	60,20%	61,70%	58,12%
Colorado	42,40%	47,00%	53,70%	51,50%	48,20%	48,56%
Connecticut	55,90%	54,30%	60,60%	58,10%	54,60%	56,70%
Delaware	55,00%	53,30%	61,90%	58,60%	53,40%	56,44%
District of Columbia	85,20%	89,20%	92,50%	90,90%	90,50%	89,66%
Florida	48,80%	47,10%	51,00%	50,00%	47,80%	48,94%
Georgia	43,00%	41,40%	47,00%	45,50%	45,60%	44,50%
Idaho	27,60%	30,30%	36,10%	32,60%	27,50%	30,82%
Illinois	54,60%	54,80%	61,90%	57,60%	55,80%	56,94%
Indiana	41,00%	39,30%	49,90%	43,90%	37,90%	42,40%
Iowa	48,50%	49,30%	53,90%	52,00%	41,70%	49,08%
Kentucky	41,40%	39,70%	41,20%	37,80%	32,70%	38,56%
Louisiana	44,90%	42,20%	39,90%	40,60%	38,50%	41,22%
Maine	49,10%	53,60%	57,70%	56,30%	47,80%	52,90%
Maryland	56,60%	56,00%	61,90%	62,00%	60,30%	59,36%
Massachusetts	59,80%	62,10%	61,80%	60,70%	60,00%	60,88%
Michigan	51,30%	51,20%	57,40%	54,20%	47,30%	52,28%
Minnesota	47,90%	51,10%	54,10%	52,70%	46,40%	50,44%
Missouri	47,10%	46,10%	49,30%	44,40%	38,10%	45,00%
Montana	33,40%	38,60%	47,30%	41,70%	35,80%	39,36%
Nevada	46,00%	48,10%	55,10%	52,40%	47,90%	49,90%
New Jersey	56,10%	53,00%	57,30%	58,30%	55,00%	55,94%
New York	57,80%	57,90%	62,80%	63,30%	58,40%	60,04%
North Carolina	43,20%	43,60%	49,70%	48,40%	46,20%	46,22%
Ohio	46,50%	48,70%	51,50%	50,70%	43,60%	48,20%
Oregon	47,00%	51,60%	56,70%	54,20%	50,10%	51,92%
Pennsylvania	50,60%	51,00%	54,70%	52,00%	47,90%	51,24%
Rhode Island	61,00%	59,40%	63,10%	62,70%	54,40%	60,12%
Tennessee	47,30%	42,50%	41,80%	39,10%	34,70%	41,08%
Texas	38,00%	38,20%	43,70%	41,40%	43,20%	40,90%
Virginia	44,40%	45,60%	52,60%	51,20%	49,80%	48,72%
Washington	50,20%	52,80%	57,70%	56,20%	54,30%	54,24%
Wisconsin	47,80%	49,70%	56,20%	52,80%	46,50%	50,60%

Table 5: U.S. states (in which at least one company in the sample is headquartered) blue state value.

Political party	2001	2005	2010	2015	2017	Average
Labour Party	40,70%	35,20%	29,00%	27,60%	40,00%	34,50%
Liberal Democrats	18,30%	22,00%	23,00%	7,90%	7,40%	15,72%
Scottish National Party	1,80%	1,50%	1,70%	4,70%	3,00%	2,54%
Green Party of England and Wales	0,60%	1,00%	1,00%	3,80%	1,60%	1,60%
Sinn Fèin	0,70%	0,60%	0,60%	0,60%	0,70%	0,64%
Plaid Cymru	0,70%	0,60%	0,60%	0,60%	0,50%	0,60%
Social Democratic and Labour Party	0,60%	0,50%	0,40%	0,30%	0,30%	0,42%
Alliance Party of Northern Ireland	0,10%	0,10%	0,10%	0,20%	0,20%	0,14%
Scottish Green Party	0,00%	0,10%	0,10%	0,00%	0,00%	0,04%
Total	63,50%	61,60%	56,50%	45,70%	53,70%	56,20%

Table 6: United Kingdom blue state value.

Political party	1997	2002	2007	2011	2016	Average
Labour Party+Democratic Left	12,90%	10,80%	10,13%	19,50%	6,60%	11,99%
Sinn Fèin	2,50%	6,50%	6,94%	9,90%	13,80%	7,93%
Green Party	2,80%	3,80%	4,69%	1,80%	2,70%	3,16%
United Left Alliance*	0,70%	0,80%	1,09%	2,60%	6,60%	2,36%
Social Democrats	0,00%	0,00%	0,00%	0,00%	3,00%	0,60%
Workers Party	0,40%	0,20%	0,15%	0,10%	0,14%	0,20%
Total	19,30%	22,10%	23,00%	33,90%	32,84%	26,23%

* United Left Alliance = Socialist Party + People Before Profit + Workers and Unemployed

Action + Solidarity

Table 7: Ireland blue state value.

3.2 DESCRIPTIVE STATISTICS

Table 8 provides the descriptive statistics. All variables have 620 observations, except governance (619 observations) and foreign sales (600 observations).

Variable	Mean	Standard deviation	Minimum	25 th percentile	Median	75 th percentile	Maximum
Foreign cash	0.59	0.29	0.00	0.37	0.64	0.84	1.00
CSR	67.86	24.74	11.97	48.44	77.19	89.00	95.06
Governance	80.78	14.79	27.57	74.01	85.31	91.77	97.03
Foreign sales	0.44	0.20	0.04	0.29	0.45	0.58	0.98
ROA	0.09	0.05	-0.02	0.05	0.08	0.12	0.26
Assets	2.70	1.15	0.64	1.82	2.58	3.48	5.67
Leverage	0.29	0.17	0.00	0.17	0.27	0.38	0.80
P/B ratio	3.69	17.08	-107.08	2.18	3.64	6.00	60.16
NWC	-0.13	1.03	-6.74	-0.19	0.03	0.21	2.19
Capex	0.04	0.04	0.00	0.02	0.03	0.05	0.19
R&D	0.06	0.08	0.00	0.00	0.02	0.09	0.35
FCF std dev	0.62	0.86	0.03	0.13	0.28	0.75	4.66

Table 8: Descriptive statistics.

The sample consists of firms which hold large amounts of their cash abroad. The “average” company has foreign subsidiaries with treasuries constituting approximately 60% of the whole consolidated cash. The values in the sample are scattered: the interquartile range (75th percentile minus 25th percentile) is nearly 50%. Some companies hold no cash abroad (foreign cash = 0%) while others do not hold cash domestically (foreign cash = 100%).

The CSR scores are generally high. As the average of the social and environmental pillars of Asset4, they can assume values from 0 to 100. The minimum value in the sample is 11.97, which is very low. But the 25th percentile is quite high (48.44). Similar values are not startling according to the transparent reporting hypothesis proposed by Kim et al. (2012): high CSR performances are associated with disclosure of more, and of better quality, pieces of information. The amount of foreign cash can be considered a sensitive information. It follows that a sample comprising only companies reporting foreign cash should generally include sustainable businesses.

It is instead partly surprising the distribution of the corporate governance scores. In business schools is generally taught that Anglo-Saxon corporations are worldwide leaders in terms of quality of their corporate governance. This strength is attributed to the large number of listed companies and to advanced legal systems (especially in Delaware). Mean, 25th percentile and

median of the corporate governance rating are high, but a few firms have relatively weak corporate governance structures (the minimum rating is 27.57).

Very interesting is the percentage of revenues generated abroad. It is high (mean = 44%, median = 45%) and indicates that the average firm in the sample is a multinational whichever conventional cut-off point is used to discriminate between a domestic enterprise, which simply exports abroad, and a genuine multinational entity – 10%, 20% or 25% foreign sales on total sales (Fernandes and Gonenc, 2016).

The profitability (as measured by ROA) is ordinary. No observation is extremely high or low and the standard deviation is very compressed (only 5%). Some companies show negative returns (the minimum value is lower than zero), but the 25th percentile is already positive. The upper tail of the distribution exhibits great returns, but it must be noted that the cost of capital in the technological sectors can be substantial.

It's not straightforward to interpret the natural logarithm of total assets, used in the regression model. It is better to describe the sample in terms of total assets, as reported in the annual reports. The 25th, 50th and 75th percentiles are respectively 6.19, 13.2 and 32.34 billion of dollars. The distribution is very skewed to the right due to a few large companies. The standard deviation is 62,33 billion \$. The median, 32.77 billion \$, is higher than the 75th percentile (32, 34 billion \$). The variable ranges from a minimum of just less than 800 million \$ (Incyte Corporation in 2014) to a maximum of nearly 655 billion \$ (General Electric in 2014).

The firms in the sample have low levels of leverage (measured as total debt on total assets). Some companies report no debt at all and in general long-term debt and short-term debt accounts for less than one third of corporate assets. The lower 75% of the distribution include observations in which total debt does not even reach 40% of the value of total assets. No company is excessively leveraged: the maximum value is 0.8, meaning that there is an extensive unutilized debt capacity (assets can be used as collaterals for financing purposes).

The price-to-book ratio is likely the trickiest variable. 28 firm-year observations (7 in 2014, 12 in 2015 and 8 in 2016) have a negative book value of equity. A negative price-to-book ratio has no economic meaning and skews the distribution to the left. I decided to leave the negative observations in the sample for two reasons. First, they represent just 4.5% of all available observations, and thus should not create massive issues. Second, in the cash holdings literature the price-to-book ratio is essentially always used, but I haven't found a scientific paper whose author decided to drop all negative observations (or, if s/he did, it wasn't disclosed in the publication itself). In the CSR literature instead, market values are not frequently used because

accounting measure of performances are better to investigate CSR- related topics (Dumitrescu and Simionescu, 2015) and there aren't many examples to follow. Another potential problem with the price-to-book ratio is that it is probably the variable which is most affected by time related factors: market valuations are susceptible to both macro-economic trends and investors' expectations (the median of the positive price-to-book ratios in the sample can vary extensively between years: it drops from 12.22 in 2014 to 7.67 in 2015, but remains relatively stable in 2016 at 7.52). The use of dummy variables to capture time fixed effects should alleviate the concern. Moreover, the price-to-book ratio has several "outliers" even after winsorizing at the 1st and 99th percentiles. The 75th percentile has a value of 6, but the maximum is more than 60. Overall, 25 observations have a value greater than 20. Nonetheless, many of these high value observations are from companies operating in a technological industry (be it biotechnology, information technology, etc.). This fact seems reasonable given that the purpose of the variable is to serve as a proxy of future growth opportunities.

The net working capital on net assets has most frequently either a negative or a very low value. The 75th percentile is slightly more than 20% of net assets. It is expected, because the variable was constructed by subtracting total cash from the net working capital. At the numerator, all current liabilities were deducted from current assets excluding immediate liquidity sources. But the scaling factor was computed as all liabilities minus all assets. Cash holdings are the dependent variable. Including cash in one of the independent variable has no specific economic meaning.

The sample contains firm-year observations with reasonably comparable capital expenditures. Except for the most extreme values (one company with no capex, another one with investments in fixed assets, intangibles and software representing nearly 20% of the total assets), most enterprises spend between 2 and 5% of their total assets on capex. This percentage may appear low, but many companies in the sample operates in industries in which not accountable intangibles represent most of the value of the business.

Research and development costs on sales are far more widespread. The lower tail of the distribution comprises firms which, supposedly, do not perform R&D activities. It's not straightforward to interpret this variable, because companies not reporting any R&D expense were considered as not performing R&D activities. This is a common assumption in the cash holdings literature, but the result is that one cannot be completely sure that the investigated R&D expenses are the actual R&D expenses. The features of this variable are consistent with Pinkowitz et al. (2016), who found that a few firm in the upper tail skew the distribution to the

right. Indeed, the last quartile comprises firms which invest between 10 and 35% of their annual revenues in R&D.

The 5-year free cash flow standard deviation signals that there's a significant variation in risk from observation to observation. The median is lower than 1/3, but some companies reveal an extremely high cash flow volatility (the mean, 0.62, is more than double the 50th percentile). I suppose that the large standard deviation is, at least partly, explained by macroeconomic factors. The free cash flows used to compute the business risk are from the 2010-2016 period. In 2011, 2013 and 2016 the U.S. economy grew much less than in 2012, 2014 and 2015. This discrepancy could have affected the cash generation ability of the companies in the sample.

3.3 CORRELATION

Table 9 is the correlation matrix.

It is immediately noticeable how the dependent variable is not strongly correlated with any predictors. The explanatory variable most correlated with foreign cash is, not surprisingly, foreign sales.

There are no problematic explanatory variables: no correlation reaches a 0.8 value. However, the correlation between CSR and governance score is significant (0.588). It is plausible that the environmental and social performances can be partially explained by a strong corporate governance (in line with the good management mechanism). Another explanation could be that firms use specific integrated ESG frameworks (Mikołajek-Gocejna, 2016), and tackle sustainability issues by the environmental, social and governance perspective at the same time.

The highest correlation, nearly 0.64, is between company size and free cash flow standard deviation. This element is remarkable because counterintuitive. A possible explanation is that larger firms are more diversified. Diversified firms have more investment opportunities (Wu et al., 2016). They are also likely not very young. According to the free cash flow theory (Jensen, 1986), managers of mature companies prefer to increase investments instead of distributing dividends. In this way, they avoid losing power. But if the correlation between cash flows and investment opportunities is not high (Duchin, 2010), the management could run-out of positive NPV projects and invest in high risk ventures if not controlled externally (Harford et al., 2008). The effect could be a higher volatility of cash flows compared to smaller corporations. Alternatively, one could simply think that only by investing in risky projects enterprises can become extremely big. High risks, high rewards.

	Foreign cash 1.0000	Foreign cash	CSR	Governance	Foreign sales	ROA	Assets	Leverage	P/B ratio	NWC	Capex	R&D	FCF std dev
Foreign cash	1.0000												
CSR	0.2703 0.0000	1.0000											
Governance	0.2035 0.0000	0.5880 0.0000	1.0000										
Foreign sales	0.3454 0.0000	0.2158 0.0000	0.1250 0.0022	1.0000									
ROA	0.1742 0.0000	0.0207 0.6061	0.0019 0.9625	0.1294 0.0015	1.0000								
Assets	-0.0689 0.0866	0.2594 0.0000	0.1278 0.0014	0.0020 0.9606	-0.3309 0.0000	1.0000							
Leverage	0.0837 0.0373	0.0705 0.0796	0.1223 0.0023	-0.0530 0.1950	-0.0847 0.0349	-0.1065 0.0080	1.0000						
P/B ratio	-0.0439 0.2746	0.0384 0.3399	0.0303 0.4510	-0.0352 0.3894	0.0428 0.2870	0.0309 0.4418	-0.1847 0.0000	1.0000					
NWC	0.0779 0.0526	0.0228 0.5712	-0.0350 0.3852	0.0545 0.1825	-0.0423 0.2933	-0.0600 0.1358	-0.0156 0.6980	-0.0784 0.0511	1.0000				
Capex	-0.1477 0.0002	0.0440 0.2738	0.0379 0.3468	-0.0428 0.2949	-0.0355 0.3779	0.0011 0.9790	0.1309 0.0011	-0.0458 0.2551	-0.0302 0.4521	1.0000			
R&D	0.0740 0.0657	0.0156 0.6982	-0.0690 0.0863	0.2744 0.0000	0.0916 0.0226	-0.0433 0.2813	-0.1625 0.0000	0.0230 0.5679	0.0153 0.7036	-0.0277 0.4918	1.0000		
FCF std dev	-0.0417 0.3003	0.2023 0.0000	0.1031 0.0103	0.0827 0.0429	-0.1321 0.0010	0.6373 0.0000	-0.0707 0.0784	0.0190 0.6375	-0.0278 0.4903	0.1286 0.0013	0.0865 0.0313	1.0000	

Table 9: Correlation matrix. The figures below the correlations are p-values.

4. EMPIRICAL RESULTS AND ROBUSTNESS TESTS

This chapter is divided in two sections. First, the empirical results are presented. Subsequently, a few robustness tests are shown.

4.1 EMPIRICAL RESULTS

Table 10 shows the 2SLS regression to test H1. The R^2 is not reported since it has no statistical meaning in the context of IV. First, many predictors have no statistical significant relationship with the amount of foreign cash. At the .05 significance level, only CSR, foreign sales, ROA, dividend policy, the dummy representing the financial sector and the year dummies have beta coefficients different from zero.

H1 seems to be confirmed: CSR is negatively associated with foreign cash. The 95% confidence interval for the CSR beta comprises only negative values. Identifying the reason behind this phenomenon is very complex.

The precautionary motive for holding cash is the first factor to consider: CSR is a risk management tool (Doucin, 2011) and reduces the information asymmetry between corporations and capital markets (Cheng et al., 2014). The value of foreign cash as a self-insurance scheme against future underinvestment risk (Boileau and Moyon, 2010) is lowered. Businesses are less interested in keeping cash abroad. They will finance future foreign projects with future debt or equity issues if needed. The same reasoning extends to the transaction motive to hold cash. Since hoarding cash is expensive (Opler et al., 1999), a lower cost of financing leads to a different equilibrium characterized by a reduced level of foreign cash holdings. Foreign subsidiaries can obtain funds cheaply if it is necessary. A third explanation can be obtained assuming the tax motive for cash holdings. If a tax optimization strategy is the main determinant of foreign cash, a company which is a good citizen will repatriate much more cash than a non-responsible peer (Christensen and Murphy, 2004). As discusses above in chapter 2.4 though, the assumption that all foreign cash is due to tax reasons is very strong, and I am personally wary of it. Only chief financial officers and senior tax consultants likely know exactly how much foreign cash of U.S. multinationals is effectively trapped abroad.

Of the other explanatory variables, the effect of foreign sales on foreign cash is obvious. More revenues abroad are linked to greater foreign cash reserves. A 1% increase in foreign sales is associated with 0.5-1% more corporate cash held abroad. It's understandable that foreign subsidiaries increase their cash holdings only if they sell.

VARIABLES	COEFFICIENTS	FIXED EFFECTS	COEFFICIENTS
CSR	-0.0191*** (0.00533)	Energy	-0.223 (0.252)
Foreign sales	0.829*** (0.164)	Materials	0.105 (0.233)
ROA	1.759** (0.792)	Industrials	0.0187 (0.228)
Assets	0.0625 (0.0480)	Consumer Discretionary	-0.211 (0.257)
Leverage	0.205 (0.204)	Consumer Staples	0.0940 (0.245)
P/B ratio	0.00105 (0.00124)	Health Care	-0.159 (0.257)
NWC	0.0277 (0.0215)	Financials	-0.643** (0.304)
Capex	-1.282 (0.841)	Information Technology	-0.243 (0.270)
R&D	1.052* (0.602)	Utilities	0.321 (0.354)
FCF std dev	0.00218 (0.0334)	2015	0.142*** (0.0363)
Dividend dummy	0.479*** (0.141)	2016	0.120*** (0.0415)
Constant	0.806** (0.332)		
Observations	600	F (22, 234)	6.02***

Note: Robust standard errors are in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 10: 2SLS to test H1.

Since there are no controls for contributions in cash transferred by the parent company and debt incurred abroad in the model (similar information is not disclosed), foreign sales are the most obvious determinant of foreign cash in the model.

Even profitability affects foreign cash. It is reasonable to expect that firms which are more profitable can generate and accumulate more cash. However, there's no way to know the profitability of foreign subsidiaries (the size of foreign operations is very rarely disclosed). Only by assuming that domestic and foreign profitability are analogous the interpretation of the relationship between foreign cash and ROA is self-explanatory. A high corporate ROA may indeed be a combination of a relevant performance at home and underwhelming results abroad. In such a case, it would be hard to understand why a great domestic profitability would have a positive effect on the percentage of foreign cash. Two (very theoretical) explanations are that foreign subsidiaries may receive funds from the parent company or

continuously use cash pooling arrangements - obtaining very-short term bank loans using as collateral the parent company's cash (Laplante and Nesbitt, 2017).

Relevant, and probably unforeseen, is the effect of the dividend policy on foreign cash holdings. A multinational which distribute dividends has more foreign cash. One would expect that a company which remunerates shareholders with dividends holds less cash, as predicted by the flexibility hypothesis (Jensen, 1986). My interpretation of this apparent paradox is that firms which distribute dividends rely on strong cash balances abroad to keep a healthy financial position. Foreign treasuries offset the reduction of domestic cash due to the distribution of dividends. Another possible explanation can be attained considering the tax motive. Companies do not repatriate cash to distribute dividends in order to avoid repatriation taxes. The dividend policy would be in that case independent of foreign cash holdings. Only domestic cash influence managers' decision to distribute dividends. The distribution of dividends reduces domestic cash balances and consequently the percentage of foreign cash on corporate cash increases. If one does not consider credible the tax motive to hold cash, it's also possible that enterprises repatriate cash after, not prior to, the distribution of dividends. But justifying this last hypothesis is difficult. I cannot think of any specific reason to postpone cash repatriation just after dividends distribution, except hoping for a miraculous sudden reduction of the repatriation tax rate (which implies that the tax motive holds true and makes this line of reasoning superfluous).

Interesting is the fact that financial companies have less foreign cash than non-financial ones. The (not tabulated) 95% confidence interval is always negative. Financial firms follow specific accounting principles. The reported cash include inventories of marketable securities (Opler et al., 1999). Moreover, they can be subject to capital requirements, which differ from country to country: For this reason, it's very complex to provide a satisfactory justification to the negative beta coefficient of the financial sector dummy. Furthermore, even utilities must follow special regulations and have their cash holdings supervised in various states. But they do not exhibit the same reduced foreign cash holdings of financial firms. I have no knowledge of the U.S. regulation for banks and insurance to give an appropriate explanation. For example, it could be that the stress tests performed by the Federal Reserve are stricter and credit institutions are required to hold more regulatory capital than abroad because of a lower valuation of the risk-weighted assets (although, as far as I know, the Internal Adequacy Assessment Process performed by the European Central Bank is all but forgiving).

Finally, the year dummies are also statistically significant. This is in line with the speculative motive for cash holdings (Keynes, 1936) and the market timing theory (Baker and Wurgler, 2002). Macroeconomic factors which fluctuate over time can play a role in shaping cash

holdings. It's possible that the monetary policy (Adão and Silva, 2017) is the main reason why firms in 2015 and 2016 hold more foreign cash than in 2014. The accommodative monetary policy worldwide makes cash cheap. Multinationals have interest in accumulating cash until it's inexpensive. From the end of 2015 the Federal Reserve has slowly but gradually increased the interest rates (and the expectation of an increase of the interest rates may have been already incorporated in corporate financial decisions since the beginning of that year). Other central banks (European Central Bank, Bank of Japan...) did not reverse their policy, making foreign cash cheaper than domestic cash. Consequently, U.S. firms (which constitute 98% of the sample) have had an incentive to accumulate more cash abroad than at home. The result could have been an increase in the percentage of foreign cash. Clearly, this only one of several possible alternative motivations of why the coefficients of the 2015 and 2016 year dummies are both positive.

The data meet the assumptions of the multiple OLS regression. The homoscedasticity assumption is not respected, but the statistical software used (Stata) can compute standard errors which are robust to heteroskedastic disturbance.

The residuals are approximatively normally distributed (Figure 6). The Shapiro-Wilk test for normality gives a V-statistic of 1.985 and a p-value of 0.04831. The null hypothesis of normality of residuals cannot be rejected.

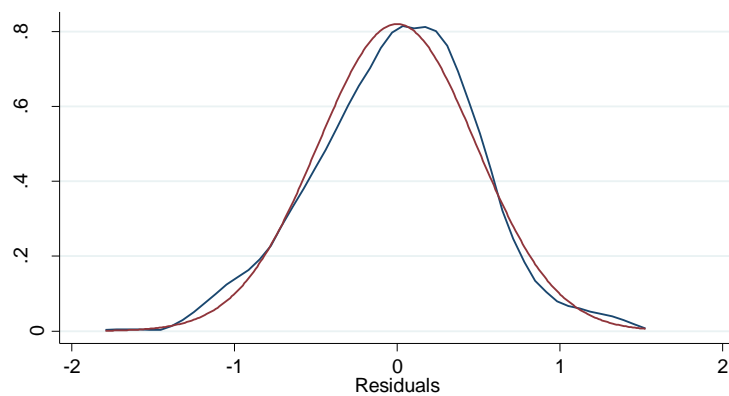


Figure 6: Kernel density estimate. The curve with mean zero is the normal density. The other curve is the kernel density estimation of the residuals of the model used to test H1.

Every continuous predictor exhibits only a slight deviation from a nonlinear relationship with the dependent variables. Overall, there is no variable showing much nonlinearity (Figure 7).

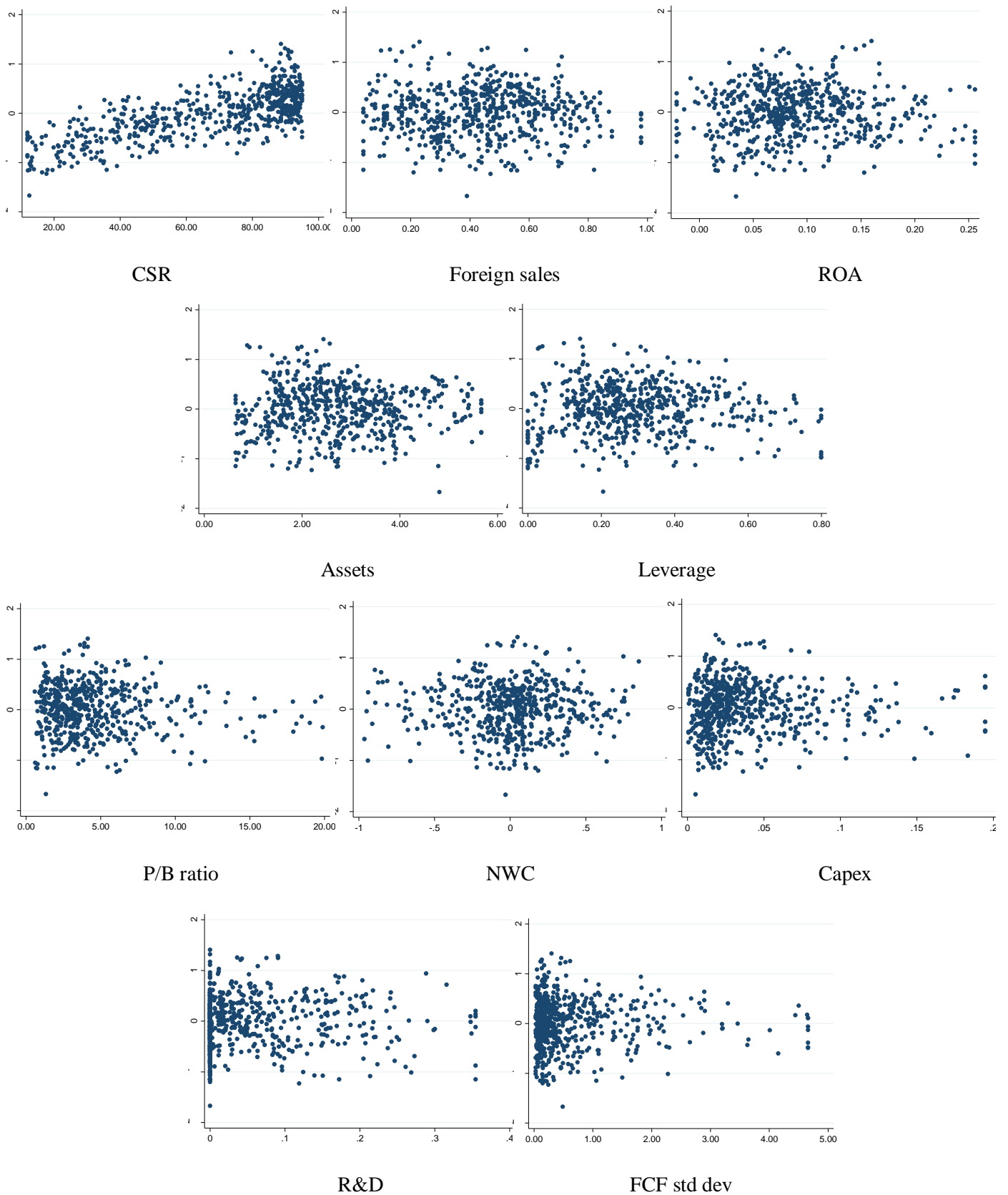


Figure 7: Scatterplots illustrating the standardized residuals against each of the continuous variables. For the price-to-book ratio the graph is limited to the 0-20 range. For the net working capital on net assets, the graph shows only observations with a value between -1 and +1. The reason is that otherwise a few extreme values make difficult to assess the degree of nonlinearity.

There's no worrying multicollinearity between continuous predictors. As already shown in chapter 3.3, the magnitude of the Pearson's correlation among continuous independent variables is never greater than 0.8. The variance inflation factors (VIF) and tolerances (1/VIF) of the predictors, excluding sector dummies, are low (Table 11).

VARIABLE	VIF	TOLERANCE
Assets	2.20	0.453953
FCF std dev	1.82	0.549961
Dividend dummy	1.45	0.689339
CSR	1.33	0.751555
2016	1.30	0.769683
2015	1.29	0.776919
R&D	1.26	0.795455
ROA	1.21	0.826530
Foreign sales	1.17	0.853234
Leverage	1.16	0.865766
P/B ratio	1.06	0.940294
Capex	1.06	0.944977
NWC	1.03	0.975082
Mean VIF	1.33	

Table 11: VIFs and tolerances of the explanatory variables.

The critical VIF values are generally indicated in 5, 10 or 30. There is no variable which originates multicollinearity. However, by using sector dummies, some possible problematic variables are detected. The variables Information technology, Industrials, Consumer Discretionary, Health Care, Consumer Staples, Materials and Financials have VIF equal to, respectively, 13.91, 11.51, 11.27, 10.20, 7.09, 5.61 and 5.24. I don't think that they are worrisome: the high VIFs are caused by the low number of observations in which they assume a value of 1, even if they are completely unassociated with other variables in the model. The F-statistic should be unaffected. The only negative consequence is a high p-value for those dummy variables.

There is a violation of the homoscedasticity assumption (Figure 8). The Pagan-Hall χ^2 test statistic is 4.251. Given that there are 22 degrees of freedom (22 indicator variables), the p-value is 1. The null hypothesis of homoscedasticity is rejected. As already highlighted, the statistical software I used (Stata) allows to cluster when estimating linear panel models. Furthermore, clustering provides standard error estimates that are robust also to autocorrelated disturbances. Autocorrelation is an issue when dealing with economics panel data as the one I constructed.

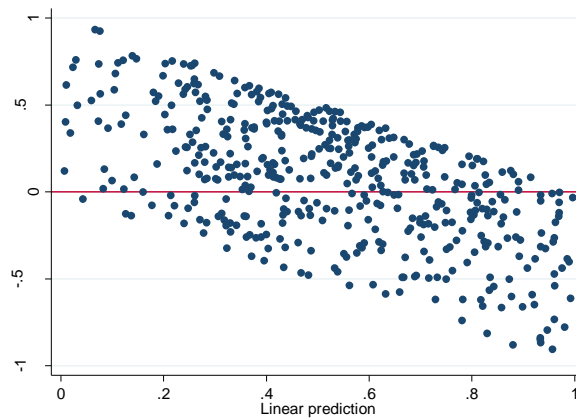


Figure 8: Residuals versus fitted values scatterplot.

An alternative way was to use the generalized method of moments (GMM) estimation instead of a 2SLS regression. GMM gives more efficient estimates of standard errors in case of heteroskedasticity (2SLS gives consistent estimates, but it is less efficient). But the efficient GMM estimator can have poor small sample properties. GMM may require very large sample sizes (Baum et al., 2003). For this reason, I preferred to stick with 2SLS.

A regression-based test of exogeneity has a F-statistic, with 1 and 234 degrees of freedom, equal to 38.5455, which is highly significant (the p-value is 0.0000). The null of exogeneity is rejected, so CSR must be treated as endogenous.

In the presence of heteroskedasticity, the traditional Craig-Donald F statistic and the Stock-Yogo critical values for the identification of strong instruments are not valid (Cheung et al., 2014). The only possible rule of thumb is the one suggested by Staiger and Stock (1997). The first stage F-statistic (the square of the first stage t-statistic) must be higher than 10. In the regression model, the Kleibergen-Papp rk Wald F statistic has a value of 15.172. The blue state variable is allegedly a strong instrument for CSR. The Hansen J statistic is 0.000, indicating that the equation is exactly identified.

To test H2, I first tried to regress the foreign cash on different subsamples according to the values of the governance score (without introducing the governance variable). The aim was to verify if for different level of the quality of corporate governance the relationship between foreign cash and CSR is different. But this approach didn't yield any relevant outcome. When subsampling, the beta coefficient of CSR is not statistically significant. I suppose that the high p-value (>0.05) was due to not enough observations. The full sample is already limited, so dividing it in several subsets does not help.

I then introduced the winsorized governance score and its interaction with the CSR variable in the model. Since the quality of corporate governance does not change much over time, including

only governance makes hard to control for relevant firm fixed effects. Through the interaction of CSR and governance it's possible to provide enough variation in governance for the estimation (Dittmar and Mahrt-Smith, 2007).

In this regression, there are two endogenous variables: CSR and CSR-governance interaction. Two instruments are needed. I used again blue state and the product of blue state and governance. This is a common approach when dealing with the interaction between an endogenous and an exogenous variable⁵².

Table 12 reports the results. Even if not significant, it's interesting that the effect of the environmental and social performances on foreign cash, when controlling for governance, is positive. A hypothetical firm with a governance score of zero could hold more cash abroad if it is more socially responsible. But the relationship is opposite, and significant, when considering the effect of governance on CSR. Companies accumulate less foreign cash (or more domestic cash), through the CSR channel, when the corporate governance is strong. Even corporate governance alone plays a relevant role in shaping foreign cash holdings. The stronger the corporate governance, the more the foreign cash holdings.

Considered together, these results lend support for some of the cash holdings theories derived from the agency motive and appear to confirm H2. However, the interpretation is tricky: governance has a positive relationship with foreign cash, but when interacting with environmental and social performances, the relationship turns negative. Given that CSR alone has not got a beta coefficient different from zero (and even if we creatively assume the opposite, the beta would still be greater than zero), it's not easy to identify what could cause the interaction of CSR and governance to have a negative effect on foreign cash. A possible solution is to assume that both the spending hypothesis of cash holdings and the information asymmetry reduction effect of CSR hold true.

Managers prefer to invest today instead that tomorrow, being more worried of their present power than of future underinvestment risk. A better corporate governance will impede managers from depleting treasuries for their own interests (Harford et al., 2008). On the other hand, CSR activities reduces the information asymmetries between managers and stakeholders (Artiach et al., 2010) by creating social capital (Kim et al., 2014). The cost of obtaining funds from capital market decreases, and firms can lessen their cash reserves: they'll be able to obtain cheap financial resources when needed.

⁵² I gathered this information from various Statalist topics. Statalist is the official forum of Stata. For example: <https://www.stata.com/statalist/archive/2013-07/msg01160.html>

VARIABLES	COEFFICIENTS	FIXED EFFECTS	COEFFICIENTS
CSR	0.0335 (0.0211)	Energy	-0.134 (0.140)
CSR-governance interaction	-0.000522*** (0.000169)	Materials	0.211** (0.101)
Governance	0.0360*** (0.00764)	Industrials	0.134 (0.0882)
Foreign sales	0.623*** (0.160)	Consumer Discretionary	0.0708 (0.127)
ROA	0.727 (0.608)	Consumer Staples	0.244** (0.100)
Assets	0.0243 (0.0395)	Health Care	-0.00135 (0.142)
Leverage	-0.0127 (0.140)	Financials	-0.345 (0.213)
P/B ratio	-0.000735 (0.00104)	Information Technology	-0.0945 (0.127)
NWC	0.0178 (0.0194)	Utilities	0.335 (0.249)
Capex	-1.523*** (0.577)	2015	0.0722** (0.0367)
R&D	1.042** (0.488)	2016	0.0548* (0.0324)
FCF std dev	-0.0240 (0.0272)		
Dividend dummy	0.114 (0.159)		
Constant	-2.147*** (0.648)		
Observations		F (24, 233)	13.01***

Note: Robust standard errors are in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 12: 2SLS to test H2.

If the mechanisms of the spending hypothesis of cash holdings and of the information asymmetry view of CSR are simultaneously in place, it is possible that even if a stronger corporate governance avoids managers to spend cash excessively, the reduction of information asymmetry generated by CSR activities outweighs those benefits. Thus, the combined effect on foreign cash holdings of corporate governance and environmental and social performances may be negative. As already discussed in chapter 2.5, the implicit assumption here is that the quality of corporate governance is alike across different subsidiaries of a multinational. If not, explaining the empirical results becomes a nearly impossible task.

When considering corporate governance, the relationship between foreign sales and foreign cash is still positive and significant. But other previously significant indicators (ROA, the financial dummy and the 2016-year dummy) lose relevance. The fact that ROA is not significant may be explained by assuming that in the population of reference (predominantly U.S. listed firms) companies with higher returns are characterized by more effective governance structures. However, the correlation between governance and ROA is very weak (0.0019, see chapter 3.3).

For the dummies, I fail to find a specific reason as to why they'd be somehow influenced by corporate governance. It's possible that differences in corporate governance may partly explain time variations in the model, so when the governance score is inserted in the regression the year dummies can't explain anymore foreign cash. But I think that compelling modifications in governance traits require time to be implemented. Since the sample has a timespan of just three years, I doubt that this element can explain the difference.

Even more problematic is the fact that the financial sector is not significant anymore. Since financial companies may be subject to special regulations due to their role in the economy, it may very well be that the observed lower cash holdings are due to a pronounced difference in corporate governance. But I'd expect in this case financial firms to have, on average, a better corporate governance quality. Instead, according to the model, when not considering the governance score, financial companies held less foreign cash than non-financial businesses. Moreover, I can't find a reason of why enterprises operating in the materials and consumer staples sectors should have greater cash reserves abroad when controlling for governance. Do they need more precautionary cash outside home soil because their foreign subsidiaries mainly have fixed assets such as plants and equipment? But why should this fact be related with corporate governance?

With governance in the regression, capital expenditures are statistically significant, while the dividend policy is not. The negative coefficient is remarkable because it seems to contradict the culture/institutions hypothesis of cash holdings. In individualistic countries, such as the U.S, companies should hold less cash because they are more likely to use excess cash to increase capex or acquisitions (instead of distributing dividends to shareholders). On the contrary, firms prefer to accumulate cash to avoid future shortfalls in collectivistic countries (Chen et al., 2015). If the U.S. parent company uses domestic cash for more capital expenditures, whereas the foreign subsidiaries prefer to hoard cash, the relationship between capex and foreign cash holdings should be positive, not negative. The only way to reconcile this result with the culture/institutions hypothesis is by speculating that most of foreign cash

holdings is held by foreign subsidiaries in countries which are more individualistic than the U.S. For example, Western European subsidiaries may increase capex and lead to the negative association of foreign cash and capital expenditures. In any case, finding a relationship among capex, corporate governance and national cultures is not a simple task.

Considering corporate governance adds an element of uncertainty also by a statistical point of view. The winsorized governance score exhibits a bit of deviation from linearity (Figure 9).

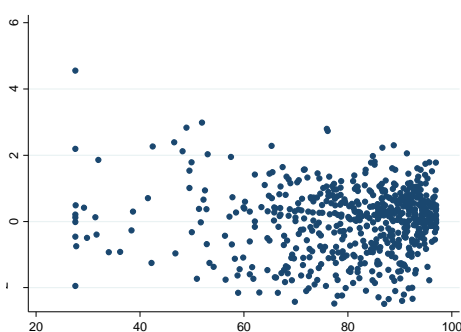


Figure 9: Standardized residuals against governance score.

Moreover, at the 5% significance level the hypothesis of normally distributed residuals (Shapiro-Wilk test) cannot be accepted. The V-statistic is 0.987, not included in the 95% critical values, 1.2 and 2.4. The p-value is 0.51311 and the null hypothesis of normality should be rejected. It is still possible to consider the assumptions of linear regression as respected. The residuals do not show a large breach of normality (Figure 10). However, one must be aware of those theoretical shortcomings.

Another issue is that corporate governance is treated as exogenous. This is the standard approach in the cash holdings literature. But I can't really support it. I believe that it is very likely that corporate governance is correlated with the error terms. Let's assume that the legal system influences the quality of corporate governance (an innocuous supposition). No one of the other predictors in the model (which are essentially the same explanatory variables used by academics when investigating cash holdings) can account for differences in national regulations.

Researchers have used many variables to instrument corporate governance: closely held shares, regional variations in trust, lagged value of governance... But these instrumental variables rely on arbitrary judgments (Love, 2010). A valid instrument should be related with corporate governance but affecting foreign cash only through its impact on governance. It's challenging to find an instrument which has no direct relationship with foreign cash.

The cash holdings literature (correctly or not) has revealed connections between cash and a boundless list of factors. I found only one instrument which in theory could be valid. As argued by Cheng et al. (2014), the CSR performances of a firm is systematically influenced by the CSR performances of industry competitors in the same year. By applying the same concept of “competition” to corporate governance (which is one of the three pillars of CSR investigated by scientific publications), I used the sector-year averages of the governance score to instrument the governance rating. In practice, this method wasn’t successful and generated a weak instrument.

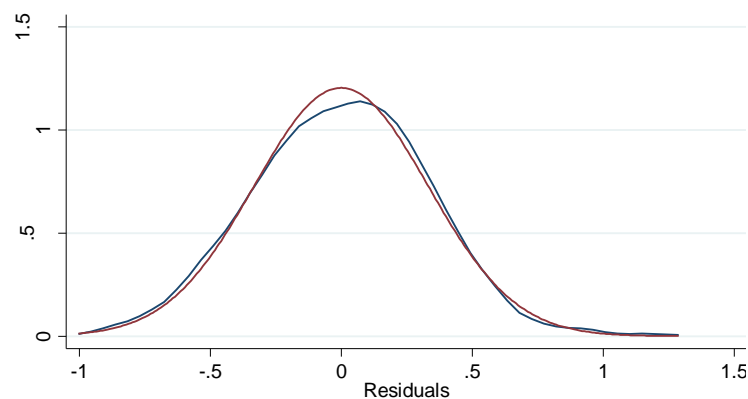


Figure 10: Kernel density estimate. The curve with mean zero is the normal density. The other curve is the kernel density estimation of the residuals of the model used to test H2.

To address exogeneity, Dittmar and Mahrt-Smith (2007) simply used the average of the governance variable and, alternatively, the initial value of the governance score, without any instruments. They argued that through this approach it’s possible to obtain a regression free of endogeneity. However, this method doesn’t allow to examine the non-cash effect that governance has on foreign cash holdings (i.e. changes in other explanatory variables). It may be suitable when investigating the value of cash holdings (as done by Dittmar and Mahrt-Smith in their 2007 paper), but I don’t believe it is acceptable when the level of cash holdings is the dependent variable.

H2 seems to be confirmed. But this result needs to be considered with caution, in light of the non-perfectly normally distributed residuals and the very likely endogeneity of corporate governance. Considering CSR as exogenous may lead to a misleading outcome. The same could be possible with the governance score. On a positive note, Dittmar and Mahrt-Smith (2007) found that endogeneity concerns about corporate governance have little impact on the value of cash holdings.

4.2 ROBUSTNESS TESTS

It is important to check whether the regression results change when excluding financial companies and utilities. Following the influential work of Opler et al. (1999), researchers nearly always exclude those companies because, as already said when discussing H1, they are subject to special regulations which could influence their cash reserves and lead to a wrong interpretation of the data. I didn't exclude financial firms and utilities because there are few of them which disclosed foreign cash. 45 firm-year observations (7% of the full sample) represents the financial and utilities sectors. After excluding them, the sample size is reduced to 575 observations.

Table 13 exhibits the results of the model used to test H1.

VARIABLES	COEFFICIENTS	FIXED EFFECTS	COEFFICIENTS
CSR	-0.0188*** (0.00529)	Energy	-0.125 (0.256)
Foreign sales	0.837*** (0.165)	Materials	0.206 (0.243)
ROA	1.476* (0.767)	Industrials	0.132 (0.236)
Assets	0.0578 (0.0508)	Consumer Discretionary	-0.0970 (0.258)
Leverage	0.223 (0.211)	Consumer Staples	0.210 (0.253)
P/B ratio	0.000956 (0.00125)	Health Care	-0.0384 (0.261)
NWC	0.0298 (0.0221)	Information Technology	-0.124 (0.281)
Capex	-1.161 (0.811)	2015	0.136*** (0.0357)
R&D	0.995 (0.688)	2016	0.108** (0.0426)
FCF std dev	0.0105 (0.0345)		
Dividend dummy	0.456*** (0.139)		
Constant	0.714** (0.332)		
Observations	557	F (20, 218)	6.73***

Note: Robust standard errors are in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 13: 2SLS to test H1, excluding firms operating in the Financials and Utilities sectors.

The coefficients are slightly different, but the overall model is very similar. The only noticeable difference is that at the 5% confidence level, ROA would not be considered statistically significant (p-value = 0.54). It may appear that enterprises operating in the financials and utilities sectors have a more significant relationship between foreign cash and profitability. But the fact that the p-value is just above the type 1 error rate could be simply a result of the reduced sample size.

Table 14 shows the 2SLS model to test H2.

VARIABLES	COEFFICIENTS	FIXED EFFECTS	COEFFICIENTS
CSR	0.0219 (0.0465)	Energy	-0.0932 (0.239)
CSR-governance interaction	-0.000449 (0.000321)	Materials	0.304 (0.186)
Governance	0.0368*** (0.00858)	Industrials	0.234 (0.177)
Foreign sales	0.689** (0.325)	Consumer Discretionary	0.134 (0.218)
ROA	0.816 (+1.092)	Consumer Staples	0.394 (0.256)
Assets	0.0338 (0.0589)	Health Care	0.0586 (0.230)
Leverage	0.00162 (0.194)	Information Technology	-0.0208 (0.209)
P/B ratio	-0.000603 (0.00154)	2015	0.0848 (0.0596)
NWC	0.0285 (0.0269)	2016	0.0572 (0.0390)
Capex	-1.341* (0.732)		
R&D	1.279 (0.899)		
FCF std dev	-0.00689 (0.0477)		
Dividend dummy	0.195 (0.342)		
Constant	-2.091** (0.827)		
Observations	556	F (22, 217,)	10.68***

Note: Robust standard errors are in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 14: 2SLS to test H2, excluding firms operating in the Financials and Utilities sectors.

This regression is far more interesting. Three explanatory variables (the interaction between CSR and governance, capex and materials sector dummy) are not statistically significant anymore. The capex and materials sector dummy are not important. But it's relevant that the interaction term between CSR and governance loses its significance. It suggests that it is the corporate governance which determine the level of cash holdings. The regression is incorrectly specified if it doesn't control for governance. Since CSR and corporate governance have a good correlation (0.588) the effect of the corporate governance on foreign cash holdings could be wrongly attributed to CSR.

The result corroborates the agency motive for cash holdings. A strong corporate governance structure leads to bigger treasuries because managers cannot freely spend in unprofitable projects. This interpretation lends support for the spending hypothesis, as when using the full sample. When excluding financial firms and utilities, CSR loses completely relevance. But this time, the information asymmetry view of CSR cannot be backed. It's only the corporate governance which determines the level of foreign cash holdings.

But, as already highlighted, corporate governance is unlikely to be exogenous. The real relationship of corporate governance on foreign cash may be different.

Another robustness test was performed by using the CSR dimensions' weights found by Capelle-Blancard and Petit (2015), as discussed in chapter 3.1 and illustrated in Table 2. Since corporate governance was exclude by my measure of CSR, I considered only the environmental and social weights. The social weight was computed as the sum of the weights of community, human rights, employees/diversity and products/customers. I used the relative proportion of the weights of environmental and social issues. For example, in the banking sector, Capelle-Blancard and Petit (2015) found that environmental and social concerns account for, respectively, 24% and 68% of the total sustainability. Consequently, I used a weight of 26% ($0.26 = 0.24/0.92$, with $0.92 = 0.24 + 0.68$) for the environmental performance and a weight of 74% ($0.74 = 0.68/0.92$) for the social performance. Capelle-Blancard and Petit (2015) provided 4 different weighting systems, related to the focus that media and NGO put on CSR strengths and weaknesses. I used the media and non-governmental organization's scrutiny for CSR strengths. The Asset4 scores consider the performances of companies in terms in sustainability without taking into consideration ESG controversies. For this reason, using the CSR weights related to strengths is better than adopting the CSR concerns' weights. The rebalanced weights applied to construct the two new CSR scores are presented in Table 15 and Table 16.

Media scrutiny	Environment	Society
Banks	26%	74%
Basic Resources	36%	64%
Chemicals	43%	57%
Consumer G&S	35%	65%
Industrial goods	60%	40%
Technology	47%	53%

Table 15: Weights used to compute the CSR score conforming to the media scrutiny.

NGO scrutiny	Environment	Society
Banks	30%	70%
Basic Resources	34%	66%
Chemicals	37,5%	62,5%
Consumer G&S	32%	68%
Industrial goods	41%	59%
Technology	41%	59%

Table 16: Weights used to compute the CSR score according to the NGO scrutiny.

Capelle-Blancard and Petit (2015) did not described how they defined the 6 sectors used in their study. I classified the firms according to the assumptions listed in Table 19. I included the few Real Estate Investment Trusts (REITs) in the sample in the consumer goods and services sector, because they are focused on residential real estate. I considered real estate as a form of durable goods. No other sector identified by Capelle-Blancard and Petit (2015) can better be associated with real estate. Alternatively, I could have included the REITs in the banks sector. In a previous GICS classification, Standard and Poor used to incorporate REITs in the financial sector because REITs also invest in mortgages. But I believe that mixing credit institutions and REITs does not recognizes the differences in their core business.

Capelle-Blancard and Petit (2015) sector	GICS sector
Banks	Financials
Basic Resources	Energy and Utilities
Chemicals	Materials and Health Care
Consumer G&S	Consumer Discretionary, Consumer Staples and Real Estate
Industrial goods	Industrials
Technology	Information Technology and Telecommunication Services

Table 17: Assumptions used to classify firms according to the sectors investigated by Capelle-Blancard and Petit (2015).

The two variables representing the CSR score computed according to the weights in Table 15 and 16 were both winsorized at the 1st and 99th percentiles.

VARIABLES	COEFFICIENTS	FIXED EFFECTS	COEFFICIENTS
CSR	-0.0183*** (0.00497)	Energy	-0.213 (0.238)
Foreign sales	0.788*** (0.156)	Materials	0.0918 (0.221)
ROA	1.794** (0.763)	Industrials	0.0163 (0.216)
Assets	0.0556 (0.0458)	Consumer Discretionary	-0.211 (0.244)
Leverage	0.211 (0.196)	Consumer Staples	0.0757 (0.234)
P/B ratio	0.000760 (0.00115)	Health Care	-0.148 (0.242)
NWC	0.0229 (0.0199)	Financials	-0.624** (0.290)
Capex	-1.231 (0.787)	Information Technology	-0.243 (0.257)
R&D	1.007* (0.575)	Utilities	0.328 (0.335)
FCF std dev	0.00186 (0.0328)	2015	0.139*** (0.0348)
Dividend dummy	0.457*** (0.132)	2016	0.121*** (0.0407)
Constant	0.805** (0.318)		
Observations	600	F (22, 234)	6.47***

Note: Robust standard errors are in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 18: 2SLS to test H1. CSR is computed according to Table 15 and Table 17.

Essentially the same results are achieved after rebalancing the weights of the environmental and social scores. There are only a few modifications in the coefficients, but the new (untabulated) 95% confidence intervals overlap nearly entirely the ones of the original model. It is intriguing that the blue state variable appears to be a better instrument for CSR using the weights provided by Capelle-Blancard and Petit (2015), compared to what it was when equal importance was given to the environmental and social dimensions. The Kleibergen-Paap rk Wald F statistic is 17.033 for Table 18 and 17.432 for Table 19, against 15.172 for Table 10.

Even when testing H2, the outcome is similar to when the environmental and social dimension are considered equally relevant for all firms. The situation is evident when looking at Table 20 and 21. The only difference is that the materials and 2015-year dummies are not statistically significant anymore at the .05 significance level. Since those relationships were dubious to begin with, there's no relevant discrepancy.

VARIABLES	COEFFICIENTS	FIXED EFFECTS	COEFFICIENTS
CSR	-0.0183*** (0.00489)	Energy	-0.212 (0.238)
Foreign sales	0.776*** (0.152)	Materials	0.0867 (0.221)
ROA	1.795** (0.753)	Industrials	-0.00300 (0.216)
Assets	0.0506 (0.0449)	Consumer Discretionary	-0.214 (0.243)
Leverage	0.216 (0.193)	Consumer Staples	0.0735 (0.235)
P/B ratio	0.000793 (0.00116)	Health Care	-0.142 (0.241)
NWC	0.0264 (0.0201)	Financials	-0.624** (0.288)
Capex	-1.251 (0.796)	Information Technology	-0.242 (0.256)
R&D	1.009* (0.572)	Utilities	0.332 (0.334)
FCF std dev	0.00411 (0.0325)	2015	0.144*** (0.0354)
Dividend dummy	0.458*** (0.130)	2016	0.125*** (0.0413)
Constant	0.822*** (0.317)		
Observations	600	F (22, 234)	6.66***

Note: Robust standard errors are in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 19: 2SLS to test H1. CSR is computed according to Table 16 and Table 17.

A legitimate question at this point is whether the results would change if the weights to the environmental and social performances were assigned according to the media and NGO scrutiny of CSR concerns. Unluckily, the only data Thomson Reuters provides on CSR concerns is its controversies category. This category is a composite score of the environmental, social and governance dimensions. This means that the weights provided by Capelle-Blancard and Petit (2015) cannot be used. You have to rely on Thomson Reuters weights, given according to analyses of the data distributions. Moreover, H2 cannot be tested because the controversies category already includes considerations on the negative governance fuss reflected in global media.

VARIABLES	COEFFICIENTS	FIXED EFFECTS	COEFFICIENTS
CSR	0.0324 (0.0232)	Energy	-0.145 (0.141)
CSR-governance interaction	-0.000509*** (0.000186)	Materials	0.195* (0.106)
Governance	0.0353*** (0.00762)	Industrials	0.123 (0.0920)
Foreign sales	0.605*** (0.153)	Consumer Discretionary	0.0458 (0.135)
ROA	0.765 (0.668)	Consumer Staples	0.231** (0.0994)
Assets	0.0216 (0.0393)	Health Care	-0.0103 (0.145)
Leverage	-0.0106 (0.138)	Financials	-0.354 (0.220)
P/B ratio	-0.000818 (0.000982)	Information Technology	-0.104 (0.133)
NWC	0.0158 (0.0182)	Utilities	0.336 (0.243)
Capex	-1.495*** (0.579)	2015	0.0719* (0.0383)
R&D	1.025** (0.480)	2016	0.0568* (0.0341)
FCF std dev	-0.0224 (0.0276)		
Dividend dummy	0.120 (0.165)		
Constant	-2.080*** (0.703)		
Observations	599	F (24, 233)	13.19***

Note: Robust standard errors are in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 20: 2SLS to test H2. CSR is computed according to Table 15 and Table 17.

It is however possible to check if this category is a significant determinant of foreign cash holdings. The ESG controversies category can be considered a proxy of the Corporate Social Irresponsibility (CSI) theorized by the penance and insurance mechanisms of CSR. The controversies category was winsorized at the 1st and 99th percentile. One would expect this variable to have the opposite effect on foreign cash of what CSR has (that is, a positive relationship between foreign cash and controversies). CSI is probably endogenous. I used as instrument blue state. If companies headquartered in Democratic-leaning states have better CSR performances, it's reasonable to suppose that firms exhibit more CSI if headquartered in states where the majority of citizens vote for the Republican Party.

VARIABLES	COEFFICIENTS	FIXED EFFECTS	COEFFICIENTS
CSR	0.0334 (0.0242)	Energy	-0.151 (0.143)
CSR-governance interaction	-0.000523*** (0.000196)	Materials	0.194* (0.109)
Governance	0.0362*** (0.00792)	Industrials	0.111 (0.0987)
Foreign sales	0.601*** (0.150)	Consumer Discretionary	0.0412 (0.139)
ROA	0.760 (0.684)	Consumer Staples	0.232** (0.101)
Assets	0.0203 (0.0379)	Health Care	-0.0127 (0.145)
Leverage	-0.00964 (0.137)	Financials	-0.361 (0.224)
P/B ratio	-0.000824 (0.00102)	Information Technology	-0.107 (0.135)
NWC	0.0176 (0.0194)	Utilities	0.339 (0.244)
Capex	-1.526** (0.593)	2015	0.0736* (0.0418)
R&D	1.045** (0.484)	2016	0.0602* (0.0362)
FCF std dev	-0.0215 (0.0284)		
Dividend dummy	0.121 (0.169)		
Constant	-2.131*** (0.746)		
Observations	599	F (24, 233)	13.13***

Note: Robust standard errors are in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 21: 2SLS to test H2. CSR is computed according to Table 16 and Table 17.

However, when substituting CSR with the controversies, the regression is not significant with $\alpha = 0.05$: $F(22, 232) = 1.55$ and $\text{Prob}>F = 0.0586$. Moreover, the instrument is weak. The first stage F-statistic is just 0.119. The correlation between the controversies category and CSR, whichever weights are assigned to the environmental and social scores, is negative (as I expected) but very weak (Table 22). This evidence refutes both the penance mechanism – according to which higher levels of CSR commitment are associated with more CSI (Kotchen and Moon, 2011) – and the insurance mechanism – which considers CSR an ex-ante penance for CSI (Minor and Morgan, 2011). It is consistent with Kang et al. (2016), who argued that CSI does not necessarily follow CSR.

	CSR - equal weights	CSR - media scrutiny	CSR - NGO scrutiny
Controversies	-0.0882	-0.0809	-0.0794
	0.0285	0.0445	0.0488

Table 22: Correlation between the controversies category and CSR. The figures below the correlations are p-values.

To eliminate the risk of incorrectly assigned weights I could have followed Gaiet (2010) and kept both the social performance and the environmental responsibility in the regression. The environmental and social scores have a correlation of 0.7441 (p-value = 0.000). The creation of a composite CSR score leads to a loss of information. The issue in keeping the CSR dimensions separated is that you need more instrumental variables. The environmental and social performances are presumably both endogenous. I couldn't find two not-weak instruments. Building one valid instrumental variable was difficult enough.

VARIABLES	COEFFICIENTS	FIXED EFFECTS	COEFFICIENTS
CSR	-0.0279*** (0.00939)	Energy	-0.267 (0.282)
Foreign sales	1.150*** (0.248)	Materials	0.279 (0.194)
ROTA	0.162** (0.0708)	Industrials	0.160 (0.163)
Assets	0.0829 (0.0629)	Consumer Discretionary	-0.171 (0.211)
Total debt to net worth	-0.0396** (0.0171)	Consumer Staples	0.320* (0.194)
P/S ratio	-0.0966*** (0.0355)	Health Care	0.0424 (0.194)
Adjusted NWC	0.0132 (0.0433)	Financials	-0.646** (0.321)
Capex	-1.454 (+1.103)	Information Technology	-0.125 (0.220)
R&D	1.723* (0.895)	Utilities	0.486 (0.326)
FCF std dev	0.0144 (0.0411)	2015	0.159*** (0.0489)
5-year average payout ratio	0.544** (0.234)	2016	0.115** (0.0550)
Constant	1.770*** (0.547)		
Observations	600	F (22, 234)	3.51***

Note: Robust standard errors are in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 23: 2SLS to test H1, using some different control variables.

VARIABLES	COEFFICIENTS	FIXED EFFECTS	COEFFICIENTS
CSR	0.0394 (0.0526)	Energy	-0.0821 (0.288)
CSR-governance interaction	-0.000649** (0.000276)	Materials	0.376** (0.181)
Governance	0.0457*** (0.0139)	Industrials	0.279* (0.144)
Foreign sales	0.749 (0.549)	Consumer Discretionary	0.206 (0.192)
ROTA	0.0828 (0.121)	Consumer Staples	0.428 (0.376)
Assets	0.0372 (0.105)	Health Care	0.119 (0.151)
Total debt to net worth	-0.0196 (0.0257)	Financials	-0.292 (0.429)
P/S ratio	-0.00559 (0.0721)	Information Technology	0.0260 (0.143)
Adjusted NWC	0.0202 (0.0530)	Utilities	0.459 (0.333)
Capex	-1.467** (0.649)	2015	0.0828 (0.0879)
R&D	1.185 (+1.590)	2016	0.0561 (0.0395)
FCF std dev	-0.0238 (0.0374)		
5-year average payout ratio	0.188 (0.433)		
Constant	-2.737** (+1.085)		
Observations	599	F (24, 233)	8.90***

Note: Robust standard errors are in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 24: 2SLS to test H2, using some different control variables.

Finally, I performed traditional robustness tests by modifying some of the variable used in the model to express a characteristic of the firm. Table 23 and 24 are two examples.

The steps I followed are: using ROE, ROTA (return on total assets, equal to EBIT on net assets) and free cash flow on net assets instead of ROA; employing total debt on net assets instead of total debt on total assets; including as a proxy of future growth prospects, in place of the price-to-book ratio, the price-to-sales ratio; setting as control variable substitutes of foreign cash, calculated as (net working capital-foreign cash)/net assets, and not substitutes of

consolidated liquid assets, computed as (net working capital-total cash)/net assets; specifying the dividend policy not through a dummy but with the 5-year year average payout ratio.

ROE and the free cash flow on net assets are not significant. This is an expected result for ROE, because it is influenced by the capital structure and the leverage is controlled by another variable. ROTA and free cash flow are not significant also when testing H1, situation in which ROA has a significant beta coefficient. The cash holdings literature generally investigates the relationship between cash and cash flow, not between cash and ROA. But when the explanatory variable of interest is CSR, it appears that ROA works better as control variable. Indeed, academics investigating CSR use ROA, and other metrics which more closely resemble cash flows, as a measure of profitability.

Using net assets as scaling factor of total debt doesn't change the fact that leverage is not significant when testing H1 and H2. Total debt to net worth and ROTA are both significant when they are simultaneously in the model used to test H1, but I can't explain the reason why.

The (net working capital-foreign cash)/net assets is not significant, but it apparently improves the first stage regression (the t-statistic is higher). The 5-year average payout ratio behaves exactly as the dividend dummy: same coefficient sign, significant when testing H1, not significant when testing H2.

The price-to-sales ratio is significant when testing H1, but not when testing H2. I suppose that the price-to-sales ratio is a significant predictor of foreign cash holdings when testing H1, whereas the price-to-book ratio isn't, because it is a measure which isn't strongly influenced by distressed situations. Given that the financial condition is controlled by another variable in the model, the price-to-sales ratio behaves better than the price-to-book ratio. In any case, cash holdings researchers generally use the latter and it's difficult to compare the result with scientific publications.

Overall, the results are confirmed. There's no unanticipated outcome in the estimation of the beta coefficients of CSR, governance and their interaction. The relationships between CSR and foreign cash and between the CSR - governance interaction and foreign cash are the same of the standard model.

5. CONCLUSION

I investigated whether a relationship between foreign cash holdings and CSR performance exists. I considered companies included in the Standard and Poor's 500 index which disclosed cash holdings of foreign subsidiaries in 2014, 2015 and 2016 and for which Thomson Reuters Asset4 provided the environmental, social and governance scores. The sample consisted of 621 firm-year observations. I constructed the CSR variable as to contain only the social and environmental dimensions, assigning them equal weights.

I performed a Two-Stage Least Squares (2SLS) regression and instrumented the CSR variable by means of a specific instrument used in the literature (blue state) to address endogeneity concerns. The model I used was an extension of the 1999 Opler-Pinkowitz-Stulz-Williamson (OPWS) regression, the most common in the cash holdings literature.

I found that CSR is a significant determinant of the percentage of foreign cash holdings. A better CSR performance is associated with a lower percentage of foreign cash holdings. The explanation can be threefold.

By a precautionary motive perspective, CSR helps companies to manage risks and reduces the information asymmetry between corporations and capital markets. There is a lower need to hoard cash abroad as a self-insurance scheme against future underinvestment risk.

Multinationals can finance future projects with future debt or equity issues if needed.

By a transaction motive point of view, CSR allows firms to keep less cash in foreign countries because it can reduce the cost of financing. Foreign subsidiaries can obtain funds cheaply if it is necessary. Consequently, businesses hoard less cash abroad to lessen the related costs.

By a tax motive viewpoint, a socially responsible firm repatriates more cash than a non-responsible peer, even if this imposes significant repatriation costs. Tax optimization strategies are avoided because they are not the "right thing" to do.

This result is robust to different weights assigned to the environmental and social ratings to build the composite CSR score, to several distinct predictors to control for some features of companies and to the exclusion of firms operating in the financials and utilities sectors, which may be subject to special regulations that can influence the amount of cash held by their foreign subsidiaries.

I tried also to determine if the corporate governance (excluded in all the aforementioned regressions) can influence the relationship between CSR and foreign cash. I found contrasting results.

When controlling for the quality of corporate governance, CSR is not statistically significant to explain foreign cash at the 0.05 confidence level. But the interaction term between CSR and corporate governance is significant and has a negative coefficient, whereas corporate governance alone is significant but with a positive beta. The evidence is consistent with the spending hypothesis of cash holdings and the information asymmetry reduction effect of CSR.

Weakly controlled managers of foreign subsidiaries prefer to overinvest in the present to increase their power, but a strong corporate governance structure can block any rapid depletion of cash reserves abroad, preventing foreign operations from undertaking value destroying projects. But CSR activities lessen the information asymmetries between managers and stakeholders, causing a reduction of the costs incurred to obtain funds from capital markets. Consequently, foreign operations can accumulate less cash. This lowering of foreign cash holdings may outweigh the increase of cash held abroad when a firm has a strong corporate governance. The combined effect would be a decrease in foreign cash.

But this conclusion is not confirmed when financial companies and utilities are excluded from the sample. More importantly, corporate governance was treated as exogenous due to the lack of suitable instruments. That's the typical approach in the cash holdings literature, but it is far from optimal.

This work has an enormous limitation: sample representativeness. Formally, the sample size is sufficient. Green's 1991 rule of thumb for multiple regression suggests $N > 50 + 8 * (\text{number of independent variables})$ for testing the multiple correlation and $N > 104 + \text{number of independent variables}$ to test individual predictors (VanVoorhis and Morgan, 2007). In the models I used, excluding the variables needed simply to control for fixed effects, there are at maximum 12 predictors, requiring 146 observations for the multiple correlation and 116 observations for testing the individual coefficients. Even considering the fixed effects dummies (bringing to number of predictors to 22), only 226 and 126 observations are necessary.

But it is indisputable that the sample has a very short time span (3 years). Furthermore, it includes only firms from the S&P500 index. Intrinsically, when investigating foreign cash holdings, the sampling method may generate bias. Not all U.S. listed firms provides the information. The transparent reporting hypothesis (Kim et al., 2012), or the opposite (Gutsche et al., 2016) may be true: companies that disclose more, and better quality, information could be the ones with better CSR performances.

This topic deserves a study which considers a longer period and firms from different countries. Generally, European listed firms do not disclose the amount of foreign cash holdings. The Securities and Exchange Commission has required additional disclosure on the matter only from 2011, focusing primarily on blue chips. Since the communication of this information to the market is essentially voluntary, forming a decently-sized sample is an extremely lengthy process. As far as I know, no professional database provides data on the amount of foreign cash. The dependent variable must be constructed by hand. I searched in way more than one thousand annual reports, but the sample has just 600 observations.

Even when the information on foreign liquidity is reported, the measure disclosed is not standardized (it can be cash and cash equivalents, cash and cash equivalents and marketable securities, cash and cash equivalents and short-term and long-term investments...). One needs to use the percentage of foreign liquidity on total liquid assets as dependent variable. An increase in this ratio may be due to a reduction in domestic cash holdings, not necessarily because of an accumulation of foreign cash. Moreover, one can only control for the values assumed by corporate features at the consolidated level. It would be ideal to have all explanatory variables referred only to foreign subsidiaries, and not to the whole company. That's not possible for a non-insider.

In a few years' time, a significantly better study will be attainable by collecting 10-years data from 2011 onwards. It will probably still be limited, for the reasons presented above. But at least it will be representative. Until then, consider this master thesis just a sneak peek in a completely unexplored topic.

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