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Cash holdings and corruption prevention commitment: Evidence from the UK

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Abstract

This study advances the literature in cash holdings in that it empirically examines the impact of corruption prevention commitment (CPC) on the cash holding strategic decisions and how such CPC might interact with cash holdings to affect firm value. We employ a sample of UK non-financial publicly listed firms and our results are of twofold. First, we detect a significant negative relationship between CPC and cash holdings, which is consistent with the expected governance effect of CPC. Second, we find a negative interaction of CPC with cash holdings when investigating cash holdings effect on firm value, suggesting that shareholders consider CPC as an overinvestment in corporate social responsibility (CSR) activity within a strong customer protection framework, such as the UK. Our findings are robust to different econometric estimations and controlling for different explanatory variables. This study offers beneficial perceptions into the notion of sustainability and sustainability standards and their implications on firms financing decisions. Finally, we argue that while this paper investigates the UK context, our results might be applicable to other countries with similar anti-corruption structure as in the UK.

KEYWORDS

cash holdings, corporate social responsibility, corporate governance, corruption prevention commitment, firm value, UK

1 | INTRODUCTION

Open and integrated economies are leading corruption to become one of the central issues facing corporations, governments and markets, driving corruption as a notion to be a rich source for academic papers. Corruption is a universal phenomenon and how to address this problem is becoming of a great concern for organisations not only at domestic levels, but also globally. Therefore, applying anticorruption mechanisms and tools in academic research is a hot

debatable topic within both international and national contexts, requiring rigorous attention from managers, governments and policy makers. The World Economic Forum (2012) estimate that the cost of corruption to be not less than \$2.6 trillion, worldwide. In recent statistics, it is documented that nearly 'one in five firms' indicated that they have received one bribery payment request (at least) when dealing with utility and regulatory transactions (UN Global Compact, 2019). Corruption not only hits developing countries but also developed countries might suffer from it as

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well. For example, in Transparency International UK (2017) reports that 766 UK firms were involved in 52 cases of money laundering and corruption, with a value of around £80 billion. Recently, FinCEN files leak, in September 2020, revealed that the UK's financial institutions facilitates global corruption and money laundering (Transparency International UK, 2020). Hence, international organisations have been engaged in developing different guidance and even tools to help organisations to fight and address corruption issues (Cardoni et al., 2020). Many international organisations participate actively in the efforts to prevent corruption such as the United Nations, Organisation for Economic Co-operation and Development (OECD), and The World Economic Forum. The Global Sustainability Standards Board (GSSB) launched in October 2016 the Global Reporting Initiative (GRI, 2016) Standards which includes GRI 205, anti-corruption standard. Governments as well have introduced laws and legislations to fight corruption and bribery. UK was among the pioneer countries which issued legislations to fight corruption and bribery, starting with the Public Bodies Corrupt Practices Act 1889, followed by the Prevention of Corruption Act 1906 and 1916, the Anti-Terrorism, Crime and Security Act 2001, the Bribery Act 2010, and the Criminal Finances Act 2017. Thus, organisations, at a global level, and governmental bodies are enhancing sustainability efforts by implementing corruption prevention measures and techniques (Allais et al., 2017; Lombardi et al., 2019). Firms' anticorruption activities can help organisations to pursue their sustainable corporate governance and corporate social responsibility (CSR) to support both the environment and the society (Lombardi et al., 2019).

In response to the importance and the growing interest of anticorruption activities, empirical studies in relation to anticorruption are more devoted to business engagement (Cardoni et al., 2020; Rodriguez et al., 2006) and the adoption of anti-corruption business models (Lombardi et al., 2019). However, there is a paucity of empirical research examining the impact of firm engagement with corruption fighting techniques on corporate financial decisions including cash holdings. Therefore, in this paper, we investigate the effect of corruption prevention commitment (CPC) on firm level financial policies and firm valuation in a sample of non-financial listed firms in FTSE 350 for the period 2002 to 2016. Specifically, we are interested in investigating two research questions related to cash holding decisions. First, what is the effect of CPC on cash holdings? Second, what is the effect of CPC on the relationship between cash holding and firm value? There is a growth in academic studies of firm liquidity and cash holdings as shareholders question the major reason for cash accumulation of large companies (Chen, 2011), yet anticorruption activities are under-

researched within such theme. Cash can be accessed by managers with less scrutiny, and the decision on holding and spending this source is at the discretionary of management. Firms stockpile cash and the value of cash holding is viewed as part of the firm overall value (Dittmar & Mahrt-Smith, 2007). Furthermore, firms hold cash for many reasons such as the low cost of financing for those firms holding cash (Ozkan & Ozkan, 2004). Thus, raising funds from external resources have higher costs in the presence of information asymmetry (Myers & Majluf, 1984), and will have more likelihood of agency problems such as poor corporate governance (Atif et al., 2019), as well as facing financial constraints alongside other transaction costs (Ozkan & Ozkan, 2004).

Previous studies argue that from developed countries perspectives, given their securities laws and their efficient markets, cash holdings should be low due to low costs associated with external financing. In addition, with strong investors protection environment, high cash levels are more likely to be disgorged. It has been expected, and even documented, that there is a positive relationship between cash holding and firm value within such context (Chen, 2011). Firms are motivated to make the necessary changes and modifications to enhance their governance structure including fighting corruption when there is a good and a safe environment (such as having effective securities laws) to attract investors, leading firms to rely more on external sources of funds (La Porta et al., 1998). Chen (2011) argues that such environments and the traditional firm-specific determinants are key drivers for cash and liquidity, and hence these aspects should be investigated in studies related to cash holdings. Particularly, when fighting corruption and bribery different techniques could be used such as corporate governance mechanisms (Lombardi et al., 2019) to mitigate agency conflicts and information asymmetry. Therefore, companies could easily access external sources of fund at a lower cost (Atif et al., 2019; Ghouma et al., 2018; Tran, 2014), reducing the company's demand on holding high levels of cash. Additionally, it is interesting to examine how the market will evaluate cash holdings for firms engaging with CPC activities. Whether the market will perceive such corruption and bribery fighting measures as an effective governance tools or management entrenchment attempts (Barnea & Rubin, 2010; Buchanan et al., 2018; Fabrizi et al., 2014) or a 'check-off' approach to seek legitimacy (Ashforth et al., 2008; Schwartz & Tilling, 2009). Consequently, on firm level perspectives and within the context of strong initiatives to control corruption, our study aims to expand the extant cash holding-corruption fighting literature by empirically examine how cash holding is related to CPC and how CPC and cash holding is associated with firm value.

In this paper, we posit and report that cash holdings are negatively associated with CPC. Furthermore, cash holding is positively associated with firm value and is consistent and significant in our different models. This can be explained by the importance of cash holdings that will add value to firms, in particular our sampled firms listed in FTSE 350. However, this relationship is subjective to CPC settings, as we detect that the interaction of cash holdings and CPC shows the value adding effect of cash holdings is reduced. Our results are robust when we control for endogeneity issues and other specifications in our models.

Our study's contribution to the cash holdings (e.g., Akhtar et al., 2023; Atif et al., 2019; Ozkan & Ozkan, 2004) and the corruption prevention (e.g., Ashforth et al., 2008; Cardoni et al., 2020; Lombardi et al., 2019; Saenz & Brown, 2018) literature are threefold. First, we propose, and find evidence, that CPC is a key determinant of cash holding and firm value, which is new and novel to the cash holding literature. Therefore, we extend the extant corruption prevention literature by providing new and robust evidence of the negative impact of CPC on cash holdings and the value of the firm, within the UK context. As a pioneering study, we present insightful understandings for the role of the CPC activities on cash holdings. Second, our study contributes to the growing research that links CSR and cash holdings (e.g., Cheung, 2016; Lu et al., 2017), as we find that corruption prevention as an overinvestment CSR activity has a negative effect on the value of cash holdings. Third, previous studies have investigated corruption and control of corruption at macroeconomic levels with special consideration to variables related to public choice (e.g., Chen, 2011; Thakur & Kannadhasan, 2019). This paper, hence, adds to the literature by examining corruption preventions influence on firm specific policies and firm values. One advantage of such context is that at a country level, we control for institutional and cultural aspects such as investor protection and corruption behaviour within the national level context (Smith, 2016; Thakur & Kannadhasan, 2019). The UK, similar to other developed countries, typically has a low corruption, according to Transparency International and this will not deter the need to examine empirically how CPC would influence cash.¹ Other studies have investigated corruption, as a general notion, on firm level financial decisions within similar contexts of developed markets (Amore & Bennedsen, 2013; Smith, 2016). Hence, we argue that while we investigate the UK context, our results might be applicable to other countries with similar anti-corruption structure.

The rest of the paper is organised as follows: Section 2 presents the relationship between CPC and cash holdings. Section 3 reviews the literature and develops the hypotheses. The research method is discussed in

Section 4, while, Section 5 elaborates on the main results and additional analysis. Finally, Section 6 provides our conclusions.

2 | CORRUPTION PREVENTION COMMITMENT AND CASH HOLDINGS

Corporate corruption as a phenomenon within firms' system has led to the development of different sustainable strategies to fight it at national and international levels (e.g., Mendelshon, 2017). In the same vein, Saenz and Brown (2018) argue that, from international perspectives, corruption has important complications on the economic and the social development as well as it has an inverse effect on sustainability. Furthermore, Montes et al. (2016) suggest that low corruption will improve the 'sovereign ratings'. Alhassan et al. (2019) report that corruption negatively influence the financial inclusion in Middle East and North African (MENA) countries. At the corporate level, corruption incurs costs that will affect business growth and will sustain reputational and legal risks (Lombardi et al., 2019). Therefore, anti-corruption measures are important for firms' sustainability and to safeguard their stakeholders, leading to enhance their images and reputations (Global Compact, 2017). Allais et al. (2017) suggest that sustainability (including CPC) might avoid different types of risks and will be rewarded by the markets and hence enhancing firms' competitive advantage. Furthermore, corruption has a negative effect on sustainable governance and will weaken the exertions in proclaiming social and environmental actions and processes (Yadav & Pathak, 2016). Therefore, anticorruption practices and measures are important mechanisms of CSR (Branco & Delgado, 2012; Weyzing, 2009). Also, anticorruption measures contribute to the broader environmental, social and governance (ESG) activities and initiatives from the governance perspectives (Lokuwaduge & Heenetigala, 2017; Yu et al., 2018).

On the other hand, corporate anticorruption initiatives depend on a 'compliance system' that comprises of a main code of conduct, clear reporting tools, as well as appropriate training and decision-making practices (Lombardi et al., 2019). However, companies started in creating formal anticorruption systems and build on the anticorruption initiatives to ensure the existence of good corruption fighting mechanisms (Ashforth et al., 2008). Thus, anticorruption tools are seen as stakeholders' 'legitimacy-seeking tools' (e.g., 'tick-box' approach) but not as mechanisms to enforce changes (Ashforth et al., 2008; Schwartz & Tilling, 2009). Our study measures organisation's CPC using an index which comprises of six

indicators related to anti-bribery/corruption provisions collected from the Thomson Reuters DataStream database. The indicators (defined by DataStream) are as follows: 'whether the company mentions public commitment to avoid bribery and corruption at the senior management and the board level; if the firm states anti-bribery and anti-corruption in its code of conduct; if the firm has internal management tools over bribery and corruption like whistle blowing systems, or hotlines; if the firm has a policy to withstand bribery and corruption in its business transactions; if the firm communicates relevant issues with employees at the organisational processes, and; if the firm has relevant employee trainings'.

Businesses hold cash for two main reasons, operational motives and to avoid agency issues (Atif et al., 2019; Thakur & Kannadhasan, 2019). The operational motives for cash hoarding, 'the precautionary motives', are when cash is employed to save transaction costs and to be used for any future financing activities (e.g., Han & Qiu, 2007). Agency problems, lead to unnecessary cash holdings, arising because of the separation between management and ownership and thus cash will provide the required latitude for spending, which might lead to self-opportunistic management (Atif et al., 2019; Jensen, 1986). High cash levels can be used as a safeguard for managers against market actions, and, surely, to avoid external inspections by financial experts and analysts. It is hence argued by previous studies, such as La Porta et al. (2000), that holding cash might lead to agency conflicts given that managers have discretionary power over spending and saving cash.

Previous studies have been devoted to examine how corporate governance might affect cash holding decisions (Atif et al., 2019; Chen, 2008; Dittmar & Mahrt-Smith, 2007). This is generally because the importance of the strategic decision to hold cash and its consequences on the agency relationship between managers and shareholders, as managers can easily use cash for different purposes (Dittmar & Mahrt-Smith, 2007). Thus, cash holding is an important aspect when examining the relationship between CPC, as a sustainable corporate governance mechanism, and firm value. Empirical literature suggests that with weak corporate governance, firms will have a clear preference to hold cash (e.g. Harford et al., 2008). In the same vein, Yun (2009) reports that the firms with weaker governance prefer cash instead of external credit. Dittmar and Mahrt-Smith (2007) also argue that weak governance in firms will lead the value of cash holdings to be lower due to the possibility of management discretionary in using such cash in negative NPV projects.

Investigating corporate liquidity from agency perspectives should shed some lights on how to improve business environments, especially through the establishment and

the enhancements of the corporate prevention of corruption infrastructure. One possible solution to agency conflicts related to cash holdings is that firms should signal their commitments to prevent corruption which usually is a result of sustainable corporate governance model (Lombardi et al., 2019). Commitment against corruption has a direct influence on cash and liquidity as it has an impact on agency problems, and consequently on corporate governance (Cardoni et al., 2020; Lombardi et al., 2019). High corruption control would enhance firm performance and financial markets efficiency, and hence should minimise agency conflicts (Chen, 2011; Stulz, 2005). Therefore, Chen (2011), is among those who, argues that firms should hold less cash in countries with high corruption control due to strong corporate governance as a monitoring tool as management has a motivation to stockpile cash for discretionary motives. Furthermore, the corporate governance role of CSR activities including the CPC implies that CSR is also an active tool to mitigate agency conflicts of cash holding decision, and therefore with strong corporate governance there is a less need to hoard cash (Cheung, 2016; Xu & Li, 2018). Moreover, firms that disclose their commitment against corruption will help in mitigating agency conflicts and enhance information efficiency, leading to higher transparency and reducing agency problems and conflicts (Chen, 2011). Managers are also likely to stockpile cash for political donations and purposes or even for bribery activities to maintain their profitable projects and ensure their competitive position in the market. To make things even, firms' liquidity and cash within high corporation control environments should be low because agency conflicts might be less severe (Chen, 2011).

In this paper, we empirically examine the effect of firm commitment to fight corruption on cash holding and firm market value for a sample of UK firms. The UK is seen to be similar to other 'Anglo-Saxon countries' in relation to institutional and legal frameworks (La Porta et al., 1998; Ozkan & Ozkan, 2004). In December 1997, the UK was among the 44 countries that signed the OECD Anti-Bribery Convention, which was enforced in February 1999. This convention aims to face the supply side of bribery to foreign public officials. UK has responded to this legally binding international agreement by introducing the Bribery Act 2010 and later on the Criminal Finances Act 2017. Organisations might be prosecuted if they fail to prevent bribery/facilitation of tax evasion. Therefore, firms could defend themselves by showing an appropriate engagement with corruption fighting activities such as proportionate procedures, top-level commitment, risk assessment, due diligence, communication and training, monitoring and review.²

3 | HYPOTHESES DEVELOPMENT

Organisations tend to make the necessary changes and adjustments to enhance their governance strategy, which should include fighting corruption especially where there are clear securities laws to improve investment. Hence, such firms are able to obtain funds from external sources more easily (Chen, 2011). The corporate governance role of CPC suggests that, CPC is one of the effective tools to mitigate cash holding that would lead to agency conflicts. With strong corporate governance, firms tend to hold lower cash (e.g. Cheung, 2016). Therefore, firms applying and/or signalling their commitments to fight corruption are expected to use less cash as such firms are able to raise more cash from outside resources at lower costs and are willing to be externally monitored by lenders such as banks. Tran (2014) reports that firms with high levels of financial transparency and bonus compensations (as corporate governance mechanisms) are capable to issue equity at lower cost. Furthermore, Ghouma et al. (2018) find a negative link between corporate governance and cost of debt in a sample of Canadian firms. This means, companies' engagement with anticorruption and antibribery mechanisms could be used as corporate governance measures (Lombardi et al., 2019) to minimise information asymmetry and agency conflicts. Thus, firms are more likely to access external sources of finance at lower costs (Ghouma et al., 2018; Tran, 2014) and consequently, reducing the company's demand for holding high levels of cash.

Also, firms with high levels of CPC as a CSR activity are more likely to hold less cash due to their high social capital and lower idiosyncratic risk (Luo and Bhattacharya, 2009). This is because such firms have good relations with stakeholders, helping to have a better ability to absorb shocks, thus reducing the need to hoard cash (Cheung, 2016). Furthermore, Cheung (2016) argues that there is a direct influence of CSR on cash holdings due to systematic risk. In the same vein, but from macro-level, Chen (2011) finds that liquidity/cash is lower in countries with effective corruption control mechanisms and effective securities laws. Thakur and Kannadhasan (2019) also find that cash is positively associated with corruption activities. Hence, we posit that:

Hypothesis 1. Firm level cash holding is negatively associated with CPC levels.

The literature suggests that cash will enhance firm value as it generates the required financial flexibility and consequently will minimise transaction costs. Previous studies argue for a positive and direct influence of firm cash levels and liquidity on firm value, but this relation is

subject to firm specific-level determinants and institutional settings (Chen, 2011; Dittmar et al., 2003; Pinkowitz et al., 2006). Institutional context will moderate the association between firm value and hoarding cash through the ability to access capital markets and low cost of debt (Dittmar & Mahrt-Smith, 2007; Lins et al., 2010). Chen (2011) suggests that this relation could be influenced or even moderated by the level of corruption in economies, because of agency conflicts (Pinkowitz et al., 2006). Corruption prevention initiatives at the firm level will improve firms' sustainable corporate governance structure (Lombardi et al., 2019) and will avoid inverse effects on the society (Elkington, 2002). Therefore, signalling CPC to stakeholders as a corporate governance activity will help in reducing the information asymmetry and agency conflicts and consequently, securing external funds at lower costs to maximise firm value.

In the same vein, the conflict-resolution view of CPC argues that corruption fighting initiatives are a key firm mechanism to resolve any conflicts with firms' stakeholders, leading to maximise the wealth of their shareholders. Corruption prevention polices as a CSR activity will mitigate the likelihood of legal actions, or any boycott actions and hence the management will decrease any uncertainties (Aroui & Pijourlet, 2017). Aroui and Pijourlet (2017) argue that CSR is positively associated with Tobin's Q in firms operating in countries with strong protection for shareholders and in countries with high institutional qualities. Investors might favour such firms with high cash value in such framework, as a high-CPC-level is associated with trusting and cooperative relations with stakeholders. With corruption control tools, holding cash will increase firm performance and value due to the less likelihood of conflicts of interests between investors and managers (La Rocca et al., 2017). Furthermore, CPC will provide incremental information about firms' commitment to fight corruption and its negative consequences on the economy and society. This, in turn, will reduce information asymmetry and will improve firm monitoring and in turn will minimise the misuse of such cash by management that will lead firm value and performance to increase.

On the other hand, the agency theory's view of CPC as a CSR activity (e.g., Jiraporn & Chintrakarn, 2013) suggests that CPC might be employed by managers for their own benefits and maximising their power and reputation as good citizens (Barnea & Rubin, 2010; Buchanan et al., 2018; Fabrizi et al., 2014). It is argued that CEOs are interested to engage in activities related to CSR as this might improve their power within the firm they are operating in (Jiraporn & Chintrakarn, 2013). Managers might also be interested in adopting CSR activities to minimise internal controls (Fabrizi et al., 2014), and/or to reduce

the takeovers likelihood (Pagano & Volpin, 2005). Also, CSR activities might be the best tool for management to work closely with firms' stakeholders to protect their positions (Prior et al., 2008). The agency standpoint of CSR suggests that CSR activities might have higher agency conflicts and high managerial entrenchment that might have an inverse effect on firm performance and value (e.g., Barnea & Rubin, 2010; Harford et al., 2008). Accordingly, investors might link high CSR activities (including CPC) to high level of cash to be used by managers for their own interests. Therefore, low value of cash will be assigned by investors for these firms. Furthermore, Lombardi et al. (2019) argue that corruption preventions-plans will increase the 'bureaucratic process' and will in turn inversely affect performance. Hence, our second hypothesis is:

Hypothesis 2. The level of CPC affects the relationship between cash holdings and firm value.

4 | SAMPLE AND RESEARCH DESIGN

Our sample comprises of non-financial listed firms in FTSE 350 for the period from 2002 to 2016. Due to data availability and allowing firms to enter and exit the market, we end with 2012 firm-year observations,³ which creates our unbalanced panel dataset for 201 firms that provided the required information for the investigated period. Consistent with the previous literature, we exclude financial and utility firms because these firms must have their own regulatory requirements for cash and liquidity (Atif et al., 2019; Cheung, 2016; Smith, 2016), and have their own strategic aims and their liquidity is not easy to be measured (Chen, 2011).⁴ We collect all variables using the DataStream database which provides information about CPC measures, CSR, corporate governance, and financial data for our sampled firms. The sample period selection is based on the availability of CPC data in DataStream where 2002 is the starting year for the CPC information. We end with 2016 as in the time conducting this research few firms provided data for 2017, so for more accurate representation of the sample, we selected 2016 as the end of the analysis period. Similar to other studies, our study uses FTSE 350 firms which comprises the largest market capitalisation listed companies on London Stock Exchange, because they represent the UK economic and CSR performance (Alsaifi et al., 2020).

To investigate how CPC will affect cash holdings, we employ cash holdings (CSHH) as the ratio of the cash

and cash equivalents to net assets. Net assets are measured as the book value of the assets minus cash and cash equivalents (Atif et al., 2019; Chen, 2011; Cheung, 2016; Xu & Li, 2018). This measurement represents the cash reserves available for managers in proportion to assets. Similar to previous studies, we also use the ratio of cash and cash equivalents to total assets (CSHH1) (e.g., Xu & Li, 2018). Tobin's Q (TOBQ), our firm value dependent variable, is measured as the book value of total assets less the book value of equity plus the market value of equity divided by book value of total assets (Ararat et al., 2017). Following previous studies (Atif et al., 2019; Cheung, 2016; Xu & Li, 2018) we control for board size, board independence, board gender diversity, institutional ownership, leverage, firm size, working capital, beta, dividends, that are among the drivers of cash holding well-documented in the literature.

Board Size (BSIZE) is measured as the total number of board members at the end of the fiscal year. Board Independence (BIND) is measured as percentage of non-executive board members. Board gender diversity is measured as percentage of women on the board. Institutional ownership (ISHR) is measured as the percentage of total shares owned by investment banks and institutions, only holdings of 5% or more. Corporate governance variables such as ownership structure (ISRH) and board characteristics (BSIZE, BIND, BDIV) are found to be among the main independent variables in the cash holding literature (e.g., Atif et al., 2019; Harford et al., 2008; Ozkan & Ozkan, 2004). Corporate governance helps in reducing agency problems by lowering the cash holdings (Chen, 2011). Excess cash holdings could be misused by management within a poor governance structure, leading such cash to reduce firm performance and value (Dittmar & Mahrt-Smith, 2007). Past studies argue that small boards are capable to do their monitoring role more efficiently and therefore mitigate agency conflicts (Yermack, 1996), thus firms are likely to hold less cash levels, as efficient corporate governance mechanisms (such as small boards) will help companies to get external finance at lower costs (Ghouma et al., 2018; Tran, 2014). Similarly, female directors are perceived as an efficient monitoring tool and can contribute to minimise the agency problem of cash holdings (Atif et al., 2019). Firms with majority of non-executive directors are more likely to hold less cash levels because the ability of non-executive directors to minimise agency costs of accessing external funds through their effective monitoring role (Ozkan & Ozkan, 2004). Institutional shareholding is one of the corporate governance mechanisms that could help in mitigating agency conflicts through their active monitoring function and therefore affecting firm's cash holding levels (Harford et al., 2008; Ozkan & Ozkan, 2004).

TABLE 1 Variable definitions.

Variable Measure	
CSHH	Cash and cash equivalents divided by total assets net of cash and cash equivalents at the end of year.
CSHH1	Cash and cash equivalents divided by total assets at the end of year.
TOBQ	Tobin's Q is the ratio of total assets minus book value of equity plus market value of equity to total assets in a financial year.
CPC	Corruption prevention commitment. This anti-corruption provision score is constructed with six indicators related to anti-bribery/corruption provisions, which are collected by ASSET4. The indicators are (1) whether the company mentions public commitment to avoid bribery and corruption at the senior management and the board level, (2) states anti-bribery and anti-corruption in its code of conduct, (3) has internal management tools over bribery and corruption like whistle blowing systems, or hotlines, (4) has a policy to withstand bribery and corruption in its business transactions, (5) communicates relevant issues with employees at the organisational processes, and (6) has relevant employee trainings. ASSET4 records 'Yes' or 'No' for each indicator so that we assign the value of one to 'Yes' and zero to 'No'. All values are aggregated and the total score ranges from zero to six; scaled to a value between 0% and 100%.
BFSIZE	The total number of board members at the end of the fiscal year
BIND	Percentage of non-executive board members
BDIV	Percentage of women on the board of directors
ISHR	The percentage of total shares owned by investors including investment banks and/or institutions, only holdings of 5% or more.
LNTA	Natural log of book value of total assets
BETA	Firm's return volatility (risk exposure)
LEV	Total debt divided by total assets
WORC	Current assets minus current liabilities scaled by total assets
DIVID	An indicator equal to one if the firm pays a dividend in year t and zero otherwise

Firm specific factors include firm size (LNTA) is measured as the book value of total assets. Large firms, in settings such as the UK, might hold less cash as they are able to raise cash externally (Chen, 2011). Leverage (LEV) is measured as total debt to total assets ratio. Chen (2011) reports that leverage has a negative effect on cash, indicating that cash and debt might be seen as a substitute to each other. While, Ozkan and Ozkan (2004) argue that the cash holdings and leverage have an ambiguous relationship. Working capital ratio (WORC) is measured as total current assets less total current liabilities divided by total assets. Previous studies found that liquid assets might substitute cash (Chen, 2011). Dividend (DIVID) is a dummy variable indicating paying dividends. If firms pay dividends then they will need to hold less cash in countries with strong control of corruption institutional settings (such as in the UK) (Chen, 2011). Beta is a measure of market risk that we control for in all our models. Our data and variables included in the models are not suffering from outliers. Table 1 includes variables definitions.

In this study we adopt different regression analyses, first we employ cross-sectional time series models with clustered standard errors. The OLS is our baseline model and we control for year and industry effects to control for any unobserved heterogeneity in our models (Aroui & Pijourlet, 2017; Atif et al., 2019). In corporate finance,

standard errors should be clustered because firm-effects will be more obvious, thus clustering the standard errors at firm-level will warrant unbiased results (Atif et al., 2019; Cheung, 2016; Dittmar & Mahrt-Smith, 2007; Thakur & Kannadhasan, 2019). We also include industry and year dummies in our models. Hence, our base model is:

$$\text{Cash}_{i,t} = \beta_0 + \beta_1 \text{CPC}_{i,t} + \beta_2 \text{CG}_{i,t} + \beta_3 \text{CONTROLS}_{i,t} + \text{Year dummies} + \text{Industry dummies} + \varepsilon_{i,t} \quad (1)$$

where the dependent variable is measured as cash and cash equivalents to net assets (CSHH), and the ratio of cash and cash equivalents to total assets (CSHH1). CPC is our corruption fighting measure which is an index to reflect the firm's attitude against corruption, the higher the index will show more commitment to fight corruption. We also include lagged CPC and changes in CPC in our base line models. we employ lagged independent variables as it might help in minimising any endogeneity issue. We control in our models for corporate governance (CG) factors (board size, board independence, female directors, and institutional ownership). Also, financial factors are controlled for (leverage, beta, liquidity, dividend payments, and firm size). Year and industry dummies are included in our models, but for parsimony we do not report these in our tables.

Variable	Mean	Median	SD	Min	Max
TOBQ	1.983968	1.555901	1.279541	0.166341	10.7529
CSHH	0.139961	0.085279	0.185512	0	2.50944
CSHH1	0.107391	0.078578	0.099438	0	0.715055
CPC	43.73757	50	36.04489	0	100
BSIZE	9.485586	9	2.444875	4	21
BIND	66.12998	66.67	12.14699	25	100
BDIV	12.84715	11.11	10.85739	0	62.5
ISHR	10.6337	9	11.79556	0	70
LEV	0.2522	0.234343	0.179067	0	1.97324
BETA	0.99009	0.89	0.554048	-2	7.9
WORC	0.083614	0.078506	0.191901	-0.76169	0.858483
DIVID	0.914513	1	0.279675	0	1
LNTA	14.77	14.10837	1.533807	9.94324	19.7457
Number of obs.	2012				

TABLE 2 Descriptive statistics.

Note: See Table 1 for variable definitions.

To measure the effect of CPC on the relationship between cash holdings and firm value, we adopt similar OLS model (we also used lagged CPC and changes in CPC to four base lines models) with the following regression equation where the dependent variable is Tobin's Q measured as book value of total assets less the book value of equity plus the market value of equity divided by book value of total assets:

$$\begin{aligned} \text{TOBQ}_{i,t} = & \beta_0 + \beta_1 \text{Cash}_{i,t} + \beta_2 \text{CPC}_{i,t} + \beta_3 \text{Cash}_{i,t} \times \text{CPC}_{i,t} \\ & + \beta_4 \text{CG}_{i,t} + \beta_5 \text{CONTROLS}_{i,t} + \text{Year dummies} \\ & + \text{Industry dummies} + \varepsilon_{i,t} \end{aligned} \quad (2)$$

Table 2 presents summary statistics for the variables used in our models that we used in our main specification. The mean cash holding level is 14%, and highly comparable to previous cash holdings studies (e.g., Arouri & Pijourlet, 2017; Atif et al., 2019; Chen, 2011). For example, Atif et al., 2019 report a mean value of 14.84% for cash ratio. Listed large firms tend to hold less cash (Lins et al., 2010). This is due to their lower information asymmetry and higher ability to access external source of funds (Pagano et al., 1998). The average value of the TOBQ variable for the sample is 1.98, consistent with previous studies (Atif et al., 2019; Brahma et al., 2021 report average value of 1.91 and 1.85 for Tobin's Q ratio, respectively). For our governance factors, we report that firms have, on average, board size of around 9.49 with 66.13% of the board are independent directors, also around 12.85% of the boards are female directors. The average institutional ownership is 10.63%. These statistics also are comparable to previous studies.

For example, Atif et al. (2019) document an average value of 9.68 and 13.08% for board size and board gender diversity, respectively. Additionally, Harford et al. (2008) report a mean value of 9.38% and 64.50% for board size and board independence, respectively.

Table 3 provides the correlation matrix for our variables. Our correlations are low in their coefficients and we would expect that our models have no multicollinearity issues.

5 | RESULTS

We empirically examine the relationship between cash holdings and CPC within the UK context. We run the OLS models and report these in Table 4 where we provide 8 models for the two definitions of cash holdings CSHH (Models 1, 2, 3, and 4) and CSHH1 (Models 5, 6, 7, and 8). The models include industry and year dummies. Our findings show that there is evidence for a negative and significant association between CPC and cash holdings in Models 2 and 6. In addition, when lagged CPC is used, we report similar findings (Models 3 and 7).⁵ While the results of changes in CPC are negative but these are not statistically significant (Models 4 and 8). Thus, we provide an empirical support to our first hypothesis when CPC and lagged CPC are used. Therefore, our findings in Table 4 support the argument that CPC as a sustainable corporate governance tool is an active mechanism to mitigate agency conflicts related to cash holding decisions. Since, previous scholars document a negative association between corporate governance mechanisms and cost of capital (Ghouma et al., 2018; Tran, 2014). Therefore, firms applying and signalling high level of CPC are

TABLE 3 Correlation matrix.

	TOBQ	CASHH	CASHHI	CPC	BFSIZE	BIND	BDIV	ISHR	LEV	BETA	WORC	DIVID	LNTA
TOBQ	1												
CASHH	0.2712***	1											
CASHHI	0.3108***	0.9395***	1										
CPC	-0.158***	-0.1569***	-0.1492***	1									
BFSIZE	-0.0645***	-0.0901***	-0.0795***	0.1825***	1								
BIND	0.0019	0.0506**	0.0749***	0.3616***	0.1903***	1							
BDIV	0.0819**	-0.0406*	-0.0466**	0.2723***	0.1330***	0.2071***	1						
ISHR	-0.0439**	-0.0015	-0.0166	-0.3435***	-0.0965***	-0.2151***	-0.2336***	1					
LEV	-0.1106*	-0.2126***	-0.2298***	0.0387***	0.0897***	0.0901***	0.0774***	-0.0329*	1				
BETA	-0.0556*	-0.0341*	-0.0366**	0.1150*	-0.0592***	0.0643***	-0.1323***	-0.0289	-0.0292	1			
WORC	0.0570**	0.3476***	0.3746***	-0.0470***	-0.2423***	-0.1410***	-0.1113***	0.0469**	-0.3480***	0.0102	1		
DIVID	0.0445*	-0.2311***	-0.2253***	0.0362*	-0.0083	-0.0142	0.0267	0.0024	-0.0193	-0.0268	-0.1043***	1	
LNTA	-0.2674***	-0.3006***	-0.3032***	0.4478***	0.5681***	0.3861***	0.2440***	-0.2474***	0.1933***	0.0557***	-0.2452***	0.1191***	1

Note: See Table 1 for variable definitions.

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

expected to hold lower levels of cash as they can raise capital from external sources at lower costs, particularly in countries with effective securities laws that protect investors interests like the UK. Our results related to CPC are in line with previous studies that report an inverse relationship between effective governance tools and the cash holdings (Atif et al., 2019; Ozkan & Ozkan, 2004).

As regards our corporate governance variables, the findings show that there is a positive effect of both board size and independence on cash holding decision. This indicate that large boards might be seen as less efficient in monitoring firms, while small boards are more efficient governance tool (Yermack, 1996) that will lead to hold less cash. Our findings are inconsistent with Harford et al. (2008) who report insignificant link between board size and cash holdings, and Atif et al. (2019) who report negative relation between board size and cash holding. While, these findings are consistent with Chen (2008) who argues (particularly from 'listed new economy' firms, such as computer and telecommunications companies) that independent directors are efficient in monitoring firms to help in mitigating agency conflicts associated with holding cash, therefore, this helps firms to use its cash holdings efficiently to maximise firm value and thus shareholders wealth. Our results also show that large firms and those firms that pay dividend have less cash holdings. This is consistent with the theoretical and empirical results which indicate that large firms in developed countries with effective securities laws that save shareholders' interests are capable to raising funds from capital markets (Chen, 2011; La Porta et al., 1998), and therefore they do not need to hold high levels of cash (Atif et al., 2019; Thakur & Kannadhasan, 2019). Furthermore, our results support the argument of Ozkan and Ozkan (2004) that firms paying dividends can secure funds by reducing dividend payments, and are consistent with previous studies (Atif et al., 2019; Harford et al., 2008). Additionally, Table 4 shows that liquidity is positively associated with cash, since such short-term assets can be easily converted to cash, indicating a complementary relationship between working capital and cash holdings. This result is in line with some previous studies that document a similar positive link (e.g., Akhtar et al., 2023). However, it is inconsistent with other previous studies that document a negative association between working capital and cash holding (Atif et al., 2019; Harford et al., 2008).

In order to empirically examine H2, the effect of CPC and cash holdings on firm value, we estimate our OLS models (using clustered errors) with Tobin's Q as our main dependent variable. The results for these models are reported in Table 5. As expected, the findings show

TABLE 4 CPC and cash holdings.

Variables	CASHH				CASHH1			
	(1) OLS	(2) OLS	(3) Lag (CPC _{t-1})	(4) Change (ΔCPC)	(5) OLS	(6) OLS	(7) Lag (CPC _{t-1})	(8) Change (ΔCPC)
CPC		-0.0006** (0.0003)	-0.0006** (0.0002)	-0.000309 (0.000236)		-0.0003** (0.0001)	-0.0003** (0.0001)	-0.000157 (0.000123)
BSIZE	0.0086** (0.0043)	0.0088** (0.0043)	0.0077* (0.0039)	0.00493 (0.00417)	0.0050** (0.0024)	0.0051** (0.0024)	0.0048** (0.0024)	0.00315 (0.00252)
BIND	0.0029*** (0.0008)	0.0030*** (0.0008)	0.0030*** (0.0008)	0.00277*** (0.000793)	0.0018*** (0.0005)	0.0019*** (0.0004)	0.0019*** (0.0005)	0.00178*** (0.000483)
BDIV	0.0005 (0.0010)	0.0006 (0.0010)	0.0007 (0.0009)	0.000249 (0.000875)	0.0002 (0.0005)	0.00033 (0.0005)	0.0005 (0.0006)	0.000165 (0.000521)
ISHR	0.0002 (0.0008)	0.0001 (0.0008)	-0.0003 (0.0009)	0.000944 (0.000948)	0.0001 (0.0004)	0.0001 (0.0004)	-0.0008 (0.0004)	0.000558 (0.000491)
LEV	-0.0535 (0.0438)	-0.0514 (0.0435)	-0.0486 (0.0437)	-0.119** (0.0484)	-0.0397 (0.0265)	-0.0385 (0.0264)	-0.0383 (0.0261)	-0.0756*** (0.0273)
BETA	-0.0203 (0.0163)	-0.0189 (0.0162)	-0.0069 (0.0148)	0.00745 (0.0165)	-0.0085 (0.0092)	-0.00766 (0.0091)	-0.0038 (0.0090)	0.00402 (0.00996)
WORC	0.356*** (0.0868)	0.351*** (0.0861)	0.227*** (0.0740)	1.93e-08** (8.02e-09)	0.187*** (0.0417)	0.184*** (0.0412)	0.129*** (0.0371)	1.28e-08*** (4.91e-09)
DIVID	-0.0679** (0.0280)	-0.0652** (0.0278)	-0.0543* (0.0305)	-0.0760** (0.0322)	-0.0410*** (0.0151)	-0.0394*** (0.0150)	-0.0372** (0.0165)	-0.0472*** (0.0175)
LNTA	-0.0318*** (0.0117)	-0.0267** (0.0122)	-0.0265*** (0.0101)	-0.0437*** (0.0108)	-0.0168*** (0.0058)	-0.0137** (0.0058)	-0.0147*** (0.0056)	-0.0252*** (0.00591)
Constant	0.392*** (0.134)	0.300** (0.145)	0.311*** (0.115)	0.658*** (0.134)	0.219*** (0.0675)	0.164** (0.0712)	0.183*** (0.0683)	0.398*** (0.0754)
Year	YES	YES	YES	YES	YES	YES	YES	YES
Industry	YES	YES	YES	YES	YES	YES	YES	YES
Obs.	2012	2012	1819	1832	2012	2012	1819	1832
R-squared	0.260	0.266	0.231	0.208	0.268	0.276	0.233	0.219

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

that the cash holding coefficients are positive and statistically significant, suggesting that firms that hold cash will have higher firm value, consistent with previous studies (Chen, 2011; Dittmar & Mahrt-Smith, 2007). The UK is a common law country that strongly protect investors' interest. Therefore, firms have less likelihood for private benefits related to cash resources due to strong investors protection that would avert managers from inversely affecting firm value (Arouri & Pijourlet, 2017; La Porta et al., 1998; Pinkowitz et al., 2006). The interaction coefficient, which is the independent variable of interest, shows that a positive effect of cash holding on firm value is almost completely reversed if the firm has higher commitment to prevent corruption (Model 2). Similar

findings are reported when lagged CPC and its interaction are used (Model 3). The results for the second measure of cash holdings (CASHH1) also show a negative and significant coefficient for the interaction effect in Models 6 and 7. While, the results of changes in CPC and its interactions are not statically significant. Thus, in general, Table 5 shows that cash holdings will lead to lower firm value if a firm is showing higher commitment to prevent corruption. Our findings could indicate that shareholders consider firm activities related to corruption prevention in a country with strong shareholders protection such as the UK as an overinvestment in CSR activity. Agency theory, argues that managers are likely to invest more in environmental and social activities (including

TABLE 5 CPC, cash holdings and firm value (Tobin's Q).

TOBQ		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Variables	OLS	OLS	Lag (CPC _{t-1})	Change (ΔCPC)	OLS	OLS	Change (ΔCPC)	Lag (CPC _{t-1})	Change (ΔCPC)	OLS	OLS
CASHH	2.100*** (0.511)	1.416*** (0.355)	1.480*** (0.384)	2.114*** (0.551)	3.656*** (0.960)	2.797*** (0.714)	3.666*** (0.920)	2.899*** (0.776)	3.666*** (0.920)	1.749*** (0.437)	4.125*** (1.204)
CASHHI											
CPC	-0.000860 (0.00149)	-0.00271* (0.00151)	-0.0028* (0.0016)	0.000137 (0.00173)	-0.000802 (0.00152)	-0.00208 (0.00146)	0.000226 (0.00140)	-0.0022 (0.0015)	0.000226 (0.00140)		
CSR										0.0046* (0.0025)	0.0054* (0.0030)
CPC × CASHH		-0.0330*** (0.0113)	-0.0336*** (0.0114)	-0.00343 (0.0198)							
CPC × CASHHI									-0.0613** (0.0237)	-0.000199 (0.0222)	
CSR × CASHH										-0.0203* (0.0112)	
CSR × CASHHI											-0.0134 (0.0208)
BFSIZE	0.117*** (0.0298)	0.111*** (0.0277)	0.105*** (0.0281)	0.118*** (0.0312)	0.117*** (0.0302)	0.110*** (0.0273)	0.117*** (0.0312)	0.104*** (0.0278)	0.117*** (0.0312)	0.114*** (0.0285)	0.123*** (0.0329)
BIND	0.0166*** (0.00526)	0.0155*** (0.00529)	0.0142*** (0.0051)	0.0155*** (0.00515)	0.0160*** (0.00510)	0.0145*** (0.00508)	0.0148*** (0.00501)	0.0130*** (0.0050)	0.0148*** (0.00501)	0.0146*** (0.0056)	0.0143*** (0.0055)
BDIV	0.0171*** (0.00578)	0.0171*** (0.00555)	0.0166*** (0.0056)	0.0185*** (0.00598)	0.0172*** (0.00597)	0.0169*** (0.00565)	0.0184*** (0.00596)	0.0163*** (0.0057)	0.0184*** (0.00596)	0.0162*** (0.0051)	0.0177*** (0.0056)
ISHR	-0.00423 (0.00481)	-0.00434 (0.00480)	-0.0013 (0.0054)	-0.00349 (0.00515)	-0.00426 (0.00472)	-0.00432 (0.00462)	-0.00361 (0.00522)	-0.00140 (0.0050)	-0.00361 (0.00522)	-0.0047 (0.0047)	-0.0043 (0.0050)
LEV	0.0647 (0.394)	0.124 (0.389)	0.120 (0.376)	-0.134 (0.372)	0.0951 (0.385)	0.184 (0.374)	-0.0968 (0.363)	0.176 (0.367)	-0.0968 (0.363)	0.115 (0.408)	-0.0739 (0.404)
BETA	-0.112 (0.0864)	-0.102 (0.0863)	-0.0669 (0.0886)	-0.146 (0.104)	-0.123 (0.0826)	-0.114 (0.0807)	-0.144 (0.104)	-0.0842 (0.0814)	-0.144 (0.104)	-0.105 (0.0888)	-0.136* (0.0760)
WORC	-0.635 (0.397)	-0.621 (0.387)	-0.761* (0.415)	-0.669 (0.415)	-0.571 (0.378)	-0.607 (0.376)	-0.644 (0.406)	-0.719* (0.394)	-0.644 (0.406)	-0.641 (0.392)	-0.708* (0.378)

(Continues)

TABLE 5 (Continued)

TOBQ		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Variables	OLS	OLS	Lag (CPC _{t-1})	Change (ΔCPC)	OLS	OLS	OLS	Lag (CPC _{t-1})	Change (ΔCPC)	OLS	OLS
DIVIDEND	0.466*** (0.161)	0.421*** (0.159)	0.381** (0.169)	0.504*** (0.153)	0.473*** (0.166)	0.434*** (0.164)	0.406** (0.174)	0.406** (0.174)	0.520*** (0.156)	0.420*** (0.159)	0.505** (0.219)
LNTA	-0.471*** (0.0934)	-0.458*** (0.0866)	-0.441*** (0.0844)	-0.482*** (0.0949)	-0.478*** (0.0979)	-0.462*** (0.0882)	-0.443*** (0.0868)	-0.484*** (0.0964)	-0.484*** (0.0964)	-0.520*** (0.0964)	-0.506*** (0.103)
Constant	6.323*** (1.126)	6.425*** (1.101)	6.254*** (1.057)	6.551*** (1.150)	6.367*** (1.189)	6.445*** (1.158)	6.264*** (1.125)	6.264*** (1.125)	6.539*** (1.161)	6.548*** (1.127)	5.877*** (1.275)
Year	Yes	Yes	YES	Yes	Yes	Yes	YES	Yes	Yes	YES	YES
Industry	Yes	Yes	YES	Yes	Yes	Yes	YES	Yes	Yes	YES	YES
Observations	2012	2012	1819	1843	2012	2012	1819	1819	1843	2012	1291
R-squared	0.363	0.382	0.388	0.365	0.354	0.377	0.382	0.382	0.361	0.373	0.387

Note: Variables are defined in Table 1.
*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

fighting corruption activities) to improve their profiles as social and environmentally friendly managers without considering shareholders' interest. Thus, this costly misuse of company's limited resources could negatively affect firm value (Buchanan et al., 2018). Barnea and Rubin (2010) find empirical evidence that there is a negative association between insiders' ownership and CSR performance, which indicates that managers may overinvest in environmental and social activities to increase their reputation as good citizens on the expense of shareholders and thus reduce firm value. In the same vein, market could interpret firm's engagement in corruption fighting activities as 'check-off' approach to seek legitimacy (Schwartz & Tilling, 2009). Furthermore, this result is consistent with Lombardi et al. (2019) argument that corruption prevention plans might increase bureaucratic process within firms and in turn will inversely influence firm performance.

One explanation for the negative impact of CPC and cash holdings interaction on firm value is that shareholders in countries with strong anticorruption settings such as in the UK may consider CPC as an overinvestment in CSR activities. Therefore, we test this explanation by using CSR (measured as an average of economic, social and environmental scores obtained from Tomson Reuters database) and its interaction effects in Equation 2. The results reported in Table 5 (Models 9 and 10). In general, the coefficients of interaction variables support the negative effect of CSR activities on the relationship between cash holdings and firm value.

With regard to the governance variables, we report that board size, board independence and female directors have positive and significant effect on Tobin's Q. These findings indicate that larger boards that appoint independent directors and have female directors are seen to reflect good governance mechanisms and will improve firm value. The positive and significant effect of board size and board gender diversity on firm value is consistent with evidence which comes from FTSE 100 by Brahma et al. (2021). However, these results are inconsistent with e Atif et al. (2019) who report negative effect of board size and board gender diversity on market value of firms, while board independence has insignificant effect on firm market value. Finally, we report that smaller firms and those that pay dividends have higher Tobin's Q. This result is consistent with Brahma et al. (2021) who report negative association between firm size and Tobin's Q, while Atif et al. (2019) reported insignificant link between dividends pay out and firm market value.

To sum up, our results demonstrates that even if commitment to prevent corruption is considered as a governance tool to reduce cash holding, shareholders consider

TABLE 6 CPC and cash holdings—additional analyses.

Variables	TOBIT		LOGIT		Large firms		High quartile	
	(1) CASHH	(2) CASHH1	(3) CASHH	(4) CASHH1	(5) CASHH	(6) CASHH1	(7) CASHH	(8) CASHH1
CPC	−0.0006** (0.0003)	−0.0003** (0.0001)	−0.0082* (0.0042)	−0.0055*** (0.0021)	−0.0004* (0.0002)	−0.0003* (0.0002)	−0.000394** (0.000187)	−0.000268** (0.000114)
BSIZE	0.0089** (0.0043)	0.0052** (0.0024)	0.133* (0.0690)	0.0971* (0.0588)	0.00244 (0.0038)	0.0024 (0.0026)	0.000426 (0.00211)	0.000812 (0.00129)
BIND	0.0031*** (0.0007)	0.0019*** (0.0004)	0.0405*** (0.0131)	0.0327*** (0.0111)	0.00155 (0.0010)	0.0012* (0.0006)	0.00100** (0.000424)	0.000840*** (0.000259)
BDIV	0.0006 (0.0010)	0.0003 (0.0005)	0.0138 (0.0159)	0.0038 (0.0138)	0.0005 (0.0009)	0.0002 (0.0006)	0.000364 (0.000528)	0.000815 (0.000322)
ISHR	0.0001 (0.0008)	0.0001 (0.0004)	0.00687 (0.0109)	−0.0009 (0.0092)	0.0003 (0.0008)	0.0001 (0.0006)	0.000128 (0.000678)	−0.000145 (0.000414)
LEV	−0.0509 (0.0433)	−0.0382 (0.0262)	−1.158 (0.801)	−1.090 (0.766)	−0.0314 (0.0614)	−0.0157 (0.0415)	−0.0725** (0.0338)	−0.0389* (0.0206)
BETA	−0.0189 (0.0161)	−0.0077 (0.0091)	0.130 (0.212)	0.0238 (0.197)	−0.0150 (0.0252)	−0.00646 (0.0164)	−0.0193* (0.0112)	−0.00765 (0.00684)
WORC	0.353*** (0.0855)	0.185*** (0.0409)	3.715*** (0.928)	3.375*** (0.830)	0.210** (0.0847)	0.131** (0.0511)	0.240*** (0.0343)	0.142*** (0.0210)
DIVIDEND	−0.0648** (0.0277)	−0.0392*** (0.0149)	−0.714** (0.325)	−0.829*** (0.287)	−0.0907** (0.0368)	−0.0553*** (0.0202)	−0.0740*** (0.0175)	−0.0409*** (0.0107)
LNTA	−0.0267** (0.0121)	−0.0137** (0.0058)	−0.313** (0.141)	−0.253** (0.125)	−0.0073 (0.0107)	−0.0031 (0.0074)	−0.0173*** (0.00617)	−0.00802** (0.00377)
Constant	0.346*** (0.134)	0.197*** (0.0670)	−0.0624 (1.809)	1.112 (1.610)	0.161 (0.170)	0.0725 (0.112)	0.447*** (0.101)	0.233*** (0.0616)
Year	YES	YES	YES	YES	YES	YES	YES	YES
Industry	YES	YES	YES	YES	YES	YES	YES	YES
Obs.	2012	2012	2012	2012	914	914	652	652
R-squared	0.182	0.180	0.178	0.141	0.213	0.216	0.239	0.253

Note: Variables are defined in Table 1.

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

this as an overinvestment in CSR activity in a country with a strong shareholders protection such as the UK.

$$\left\{ \begin{array}{ll} \text{Cash}_{it} = \beta_0 + \beta' X_{it} + \varepsilon_{it} & \text{if the right hand-side} > 0 \\ = 0 & \text{Otherwise} \end{array} \right\} \quad (3)$$

5.1 | Additional analyses

We run different additional models to empirically examine the relationship between CPC, cash holdings and firm value. First, as the cash holding variables take a minimum value of zero and positive values are only reported for cash holdings. Thus, the study employs Tobit models with clustered standard errors as another estimation technique for our models. The Tobit model is represented by:

The variables are as defined before and models include all the control variables as discussed in Equation 1. We report the results in Table 6, where we have 2 models representing the two cash holdings definitions used in our paper (Models 1 and 2). The main variable of concern in this study, CPC, is significant and negative, indicating that firms that fight corruption hold lower cash which is consistent with the findings in Table 4 and in line with our first hypothesis. We report the same effect for the

TABLE 7 CPC, cash holdings and firm value before and after 2010.

Variables	Before 2010				After 2010			
	(1) CASHH	(2) CASHH1	(3) TOBQ	(4) TOBQ	(5) CASHH	(6) CASHH1	(7) TOBQ	(8) TOBQ
CASHH			1.361*** (0.414)				1.467*** (0.505)	
CASHH1				2.280*** (0.672)				3.399*** (1.032)
CPC	-0.0004 (0.0003)	-0.0003* (0.0002)	-0.0007 (0.0020)	0.0003 (0.0019)	-0.0006* (0.0003)	-0.0003 (0.0002)	-0.0047** (0.0021)	-0.0042** (0.0020)
CPC × CASHH			-0.0325** (0.0151)				-0.0397*** (0.0139)	
CPC × CASHH1				-0.0503* (0.0285)				-0.0857*** (0.0288)
BSIZE	0.0113* (0.0058)	0.0060** (0.0029)	0.109*** (0.0317)	0.114*** (0.0334)	0.0073 (0.0044)	0.0045* (0.0026)	0.111*** (0.0318)	0.107*** (0.0299)
BIND	0.0036*** (0.0009)	0.0021*** (0.0005)	0.0204*** (0.0075)	0.0209*** (0.0074)	0.0026*** (0.0008)	0.0017*** (0.0005)	0.0079 (0.0059)	0.0063 (0.0057)
BDIV	0.0001 (0.0012)	0.0008 (0.0007)	0.0106** (0.0053)	0.0107* (0.0057)	0.0008 (0.0011)	0.0004 (0.0006)	0.0253*** (0.0079)	0.0246*** (0.0074)
ISHR	-0.0016* (0.0009)	-0.0008* (0.0004)	0.0007 (0.0046)	-0.0003 (0.0049)	0.0029** (0.0013)	0.0015** (0.0006)	-0.0055 (0.0094)	-0.0067 (0.0090)
LEV	-0.205*** (0.0576)	-0.122*** (0.0373)	0.458 (0.399)	0.432 (0.392)	0.0162 (0.0480)	0.00420 (0.0267)	0.204 (0.554)	0.262 (0.544)
BETA	-0.0276 (0.0189)	-0.0101 (0.0102)	-0.137* (0.0720)	-0.169** (0.0734)	-0.0182 (0.0209)	-0.0097 (0.0111)	-0.0568 (0.138)	-0.0489 (0.136)
WORC	0.303*** (0.0813)	0.152*** (0.0408)	-0.819** (0.348)	-0.667* (0.360)	0.384*** (0.0943)	0.212*** (0.0455)	-0.528 (0.600)	-0.675 (0.614)
DIVID	-0.0486 (0.0390)	-0.0364 (0.0229)	0.240 (0.278)	0.260 (0.283)	-0.0920** (0.0376)	-0.0486*** (0.0180)	0.547*** (0.187)	0.558*** (0.191)
LNTA	-0.0480** (0.0194)	-0.0232*** (0.0080)	-0.417*** (0.0822)	-0.445*** (0.0926)	-0.0122 (0.0084)	-0.0071 (0.0050)	-0.485*** (0.101)	-0.480*** (0.0965)
Constant	0.703*** (0.249)	0.361*** (0.103)	5.436*** (1.021)	5.767*** (1.190)	0.152 (0.101)	0.0911 (0.0610)	6.771*** (1.333)	6.655*** (1.278)
Year	YES	YES	YES	YES	YES	YES	YES	YES
Industry	YES	YES	YES	YES	YES	YES	YES	YES
Obs	829	829	829	829	1035	1035	1035	1035
R-squared	0.322	0.323	0.463	0.428	0.259	0.273	0.374	0.388

Note: Variables are defined in Table 1.

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

corporate governance factors, in terms of board size and independence as well as we support the findings related to firm size, dividend payments and liquidity.

Second, we run our models using logit models, where the dependent variable represents the ability to hold more

cash than the average cash holding in our sample. The dependent variable is measured as a dummy variable taking the value of 1 if firms hold more cash than the average value and zero otherwise. We report these models in Table 6 (Models 3 and 4), our findings are consistent with

TABLE 8 CPC, cash holdings and firm value: IV reg.

Variables	CASHH (1)	CASHH (2)	CASHH1 (3)	CASHH1 (4)	TOBQ (5)	TOBQ (6)	TOBQ (7)	TOBQ (8)
CASHH					1.896*** (0.169)	1.422*** (0.178)		
CASHH1							3.515*** (0.316)	3.053*** (0.326)
CPC		-0.0008*** (0.0002)		-0.0005*** (0.0001)	-0.00171 (0.0011)	-0.0035*** (0.0012)	0.0055** (0.0024)	0.0050** (0.0024)
CPC × CASHH						-0.0321*** (0.0046)		
CPC × CASHH1								-0.0477*** (0.0080)
BSIZE	0.0101*** (0.0023)	0.0106*** (0.0023)	0.0064*** (0.0013)	0.0066*** (0.0013)	0.148*** (0.0162)	0.144*** (0.0160)	0.139*** (0.0166)	0.135*** (0.0164)
BIND	0.0040*** (0.0005)	0.0044*** (0.0005)	0.0026*** (0.0003)	0.0028*** (0.0003)	0.0223*** (0.0034)	0.0205*** (0.0034)	0.0181*** (0.0037)	0.0159*** (0.0036)
BDIV	0.0010* (0.0005)	0.00126** (0.0005)	0.0007** (0.0003)	0.0009*** (0.0003)	0.0223*** (0.0036)	0.0224*** (0.0036)	0.0196*** (0.0037)	0.0192*** (0.0037)
ISHR	-0.00001 (0.0009)	-0.0004 (0.0009)	0.0002 (0.0005)	0.0001 (0.0005)	-0.0001 (0.0063)	0.0007 (0.0062)	0.00130 (0.0065)	0.0021 (0.0064)
LEV	-0.0446* (0.0228)	-0.0379* (0.0227)	-0.0336*** (0.0129)	-0.0298** (0.0129)	-0.0703 (0.157)	-0.0010 (0.155)	-0.0931 (0.160)	-0.0167 (0.159)
BETA	-0.0099 (0.0079)	-0.0089 (0.0078)	-0.0055 (0.0045)	-0.0050 (0.0044)	-0.130** (0.0541)	-0.128** (0.0533)	-0.137** (0.0550)	-0.136** (0.0542)
WORC	0.321*** (0.0239)	0.317*** (0.0238)	0.179*** (0.0135)	0.176*** (0.0135)	-0.598*** (0.173)	-0.592*** (0.170)	-0.575*** (0.175)	-0.600*** (0.173)
DIVID	-0.0577*** (0.0133)	-0.0556*** (0.0132)	-0.0368*** (0.0075)	-0.0356*** (0.0075)	0.506*** (0.0915)	0.456*** (0.0904)	0.507*** (0.0931)	0.469*** (0.0919)
LNTA	-0.0348*** (0.0040)	-0.0287*** (0.0041)	-0.0199*** (0.0023)	-0.0163*** (0.0023)	-0.514*** (0.0291)	-0.500*** (0.0288)	-0.565*** (0.0329)	-0.554*** (0.0329)
Constant	0.342*** (0.0572)	0.249*** (0.0595)	0.197*** (0.0324)	0.143*** (0.0337)	5.952*** (0.410)	6.003*** (0.404)	6.734*** (0.474)	6.802*** (0.465)
Year	YES	YES	YES	YES	YES	YES	YES	YES
Industry	YES	YES	YES	YES	YES	YES	YES	YES
Observations	1805	1805	1805	1805	1805	1805	1805	1805
R-squared	0.256	0.261	0.252	0.258	0.356	0.375	0.336	0.354
Sargan test	0.008	0.070	0.395	0.654	0.002	0.018	0.222	0.281

Note: Variables are defined in Table 1.

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

the previous findings reported in Table 4 and hence we provide strong support for our first hypothesis.

Third, we run our models with the focus on larger firms in our sample. This is because large firms are more able to access external source of funds and hence have

less likely to hold cash. Furthermore, large companies are subject to more scrutiny from finance providers, financial analysts and the media. Therefore, CPC governance role in minimising agency conflict and hence the need for cash holdings may be different in large

companies. To do so, we estimate the regression models for firms that are larger than the average firm size of our sample. We report the results in Models 5 and 6 of Table 6. Our results support the negative effect of CPC on cash holdings which is consistent with our first

hypothesis. We run an upper quartile regression (75-quartile) as an additional check for firm size and the results are consistent and confirm our previous findings.

Fourth, we also investigate the robustness of our results for the event of introduction of the UK Bribery

TABLE 9 Sample split high-low CG scores.

Variables	CASHH							
	(high CG) (1)	(low CG) (2)	(high CG) (3)	(low CG) (4)	(high CG) (5)	(low CG) (6)	(high CG) (7)	(low CG) (8)
CASHH			1.649*** (0.525)	1.815** (0.837)				
CASHH1							3.038*** (1.034)	4.868*** (1.395)
CPC	-0.000723** (0.000281)	-0.000694** (0.000348)	-0.00574** (0.00224)	-0.000717 (0.00252)	-0.000418** (0.000167)	-0.000423** (0.000191)	-0.00449* (0.00238)	0.000586 (0.00272)
CPC × CASHH			-0.0448*** (0.0133)	-0.0146 (0.0254)				
CPC × CASHH1							-0.00245 (0.00918)	-0.0107 (0.0150)
BSIZE	0.00505 (0.00440)	0.0141*** (0.00533)	0.130*** (0.0327)	0.0944*** (0.0289)	0.00368 (0.00283)	0.00722*** (0.00249)	0.163*** (0.0500)	0.0935*** (0.0340)
BIND	0.00193** (0.000795)	0.00418*** (0.000909)	0.00969 (0.00601)	0.0176*** (0.00586)	0.00138*** (0.000526)	0.00241*** (0.000482)	0.00692 (0.00604)	0.0187** (0.00726)
BDIV	0.000782 (0.000889)	0.000293 (0.00145)	0.0150** (0.00617)	0.0177*** (0.00645)	0.000328 (0.000539)	0.000156 (0.000758)	0.0193** (0.00890)	0.0262** (0.0101)
ISHR	0.000409 (0.000763)	-0.000177 (0.00110)	-0.0156*** (0.00581)	0.00270 (0.00546)	0.000166 (0.000481)	-1.40e-05 (0.000501)	-0.00976 (0.00732)	0.00214 (0.00775)
LEV	-0.00401 (0.0449)	-0.0692 (0.0645)	-0.104 (0.439)	0.346 (0.512)	-0.00678 (0.0294)	-0.0554 (0.0382)	-0.946* (0.477)	0.484 (0.582)
BETA	-0.00900 (0.0197)	-0.0218 (0.0179)	-0.147 (0.123)	-0.0971 (0.0887)	-0.00689 (0.0128)	-0.00760 (0.00939)	-0.0256 (0.194)	-0.133 (0.0929)
WORC	0.172** (0.0746)	0.534*** (0.119)	-0.743 (0.489)	-0.377 (0.356)	0.110** (0.0432)	0.257*** (0.0484)	-1.299** (0.603)	-0.510 (0.468)
DIVID	-0.0890** (0.0391)	-0.0426 (0.0354)	0.322* (0.192)	0.421** (0.205)	-0.0508** (0.0206)	-0.0311* (0.0179)	0.604** (0.238)	0.247 (0.239)
LNTA	-0.0154** (0.00772)	-0.0435** (0.0200)	-0.404*** (0.0826)	-0.549*** (0.114)	-0.00993* (0.00516)	-0.0198** (0.00805)	-0.360*** (0.109)	-0.677*** (0.162)
Constant	0.217* (0.110)	0.525** (0.221)	6.193*** (1.176)	7.604*** (1.331)	0.146* (0.0754)	0.248*** (0.0939)	4.758*** (1.332)	9.772*** (1.999)
Year	YES	YES	YES	YES	YES	YES	YES	YES
Industry	YES	YES	YES	YES	YES	YES	YES	YES
Obs.	1076	936	1076	936	1076	936	640	662
R-squared	0.177	0.373	0.367	0.437	0.185	0.387	0.361	0.458

Note: Variables are defined in Table 1.

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

Act 2010. We estimate our models before 2010 and after 2010 and report these results in Table 7. There is a clear evidence that our previous results are supported for the time-frame before and after 2010 and hence we provide a strong support for the relationship between CPC and cash holdings as well as CPC effect on cash holdings relationship with firm performance. It seems that for our sampled firms such enforcing act has a minimal effect on the interrelationships that we empirically examine in this paper. However, the confidants of CPC and the interaction variables $CPC \times CASHH$ and $CPC \times CASHH1$ become more significant after 2010. This could be a result of the corruption cost turns to be higher after the UK Bribery Act 2010 took effect. Therefore, the market may interpret the higher engagement with CPC activities as an attempt by managers to overinvest in social responsibility activities to enhance their entrenchment (Barnea & Rubin, 2010; Buchanan et al., 2018; Fabrizi et al., 2014) or a 'check-off' approach to seek legitimacy (Ashforth et al., 2008; Schwartz & Tilling, 2009).

Fifth, to check for any endogeneity issue in our models, we run 2SLS models for the main models in our study. The results are reported in Table 8. The results support our previous findings and show that there is a negative effect of CPC on cash holdings which supports H1 and our previous findings. Cash holding has a positive effect on firm value while the interaction variables have negative significant effects, which is consistent with our previous findings and H2. The corporate governance and financial factors have similar results reported previously and hence our results are consistent after controlling for the endogeneity issue in our models. Our instruments in these models are lagged the investigated corporate governance factors. This approach is commonly used in the corporate governance literature due to the lack of good external instruments for corporate governance variables (Nguyen et al., 2014). The Sargan test for the validity of the instruments is not statistically significant in all our models and thus these instruments are valid.

Finally, previous studies found that corporate governance level could affect the association between cash holdings and firm value (Dittmar & Mahrt-Smith, 2007). Therefore, we split our models based on corporate governance practices and employ a corporate governance index from DataStream. We classify a firm with higher than median score to be firms with high governance practices and those with lower than the median to be at low governance practices. In general, the results, reported in Table 9, are in line with our previous findings, supporting the governance effect of CPC. Additionally, the results for the interaction variables show that the negative moderation effect of CPC on the relationship between cash holdings and firm value is more likely in

high governance firms (Model 3) compared to lower governance ones (Models 4 and 8). This could indicate that market perceive the negative effect of CPC (as an overinvestment in CSR activity) on Cash holdings/firm value relationship, particularly in firms with high governance level.

6 | CONCLUSION

This paper aims to shed light on the relationship between corruption fighting and cash holding decision within listed firms in the UK context. Our period of investigation is from 2002 to 2016 resulting in 2012 firm-year observations. The findings of this paper do contribute to the extant research on cash holdings and liquidity by providing new evidence from the UK's strong investors protection and anticorruption institutional settings. Our findings suggest that CPC can proxy for a sustainable corporate governance mechanism to alleviate agency conflicts and minimise the motivation for firms to 'shield liquid assets'. These results will help academics and researchers to consider that anti-corruption initiatives tend to optimise firms' asset structure. Therefore, our results show that CPCs are associated with more efficient use of cash holdings. We believe that these results are novel and will help in understanding cash holding strategic decisions.

Furthermore, the introduction of the interaction effect between cash holdings and CPC reflects the partial influence of the cash on firm value for firms with high level of corruption prevention activities. Our findings show that the coefficient of the interaction effect is negative and statistically significant. This might suggest that the positive influence of cash holdings on performance is completely balanced out in firms employing corruption prevention initiatives. This means, cash holdings will lead to lower firm value for firms showing higher commitment to prevent corruption. This indicates that shareholders may consider firm activities related to corruption prevention in a country with strong shareholders protection such as the UK as an overinvestment in CSR activity or a 'check-off' approach to seek legitimacy.

In this paper, we offer several useful implications for researchers and practitioners. For researchers, corruption prevention as one of the Global Reporting Initiative (GRI) Standards should be considered in future cash holdings and cash management studies. Controlling corruption is expected and found to be an important tool in determining firm cash levels and liquidity as well as its performance and value, alongside the firm specific factors and corporate governance variables. This is because corruption and bribery fighting measures represent a sustainable corporate governance mechanism that will help

in alleviating agency conflicts associated with cash holdings. Markets with high levels of investor protection might perceive corruption and bribery prevention tools as a managerial overinvestment in social responsibility activities or a 'check-off' approach to seek legitimacy. For practitioners, firms would need to consider possible effects of corruption control activities when deciding their cash policy and their optimal cash levels. We provide evidence that management should have lower cash when controlling for possible corruption activities since agency problems are mitigated in strong governance environment with stronger investor protection.

We acknowledge the importance of examining the corruption prevision measures' effect using questionnaires and/or interviews to shed extra lights on these activities from firms' level perspectives. In addition, it is important to employ a similar framework (as what we adopted in this paper), but within cross-country analysis as this will help in enhancing our understanding of the relationship between cash holdings and corruption fighting activities. However, investigating these aspects are beyond the scope of this study, and thus we encourage other studies to examine these relationships empirically as such aspects will help in enhancing our understanding of activities related to being more socially responsible and their direct impact on strategic financial decisions such as cash holdings.

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DATA AVAILABILITY STATEMENT

The data that support the findings of our study are available from DataStream. DataStream; Thomson Reuters DataStream. Available at: Subscription Service (extracted: 2017).

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ENDNOTES

¹ In 2020, The UK is ranked the 11th over 180 countries on the Corruption Perception Index of Transparency International. The UK's score is 77 and the index ranges between 100 (highly clean) and 0 (highly corrupt). (<https://www.transparency.org/en/countries/united-kingdom>).

² The number of cases which have been taken to court since the introduction of the Bribery Act in 2010 to 2020 is 5 cases, according to Serious Fraud Office (SFO, 2020). (<https://www.sfo.gov.uk/foi-request/2020-040-bribery-act-2010/>).

³ The data that support the findings of our study are available from DataStream. DataStream; Thomson Reuters DataStream. Available at: Subscription Service (extracted: 2017).

⁴ Out of FTSE 350 firms, we exclude 121 firms that are classified as financial firm, which resulted in 229 non-financial listed firms. A total of 28 firms have been excluded from our analyses due to insufficient data, leading to a final sample of 201 non-financial listed firms.

⁵ The reason for this specification (lag analysis) is that some governance factors might require time to influence the strategic decision of cash-holding and firm value (Atif et al., 2019) as well as using lags might help in minimising any endogeneity issue.

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