ESSAYS ON CORPORATE FINANCE AND SOCIAL CAPITAL: DIVIDEND POLICY, CAPITAL STRUCTURE, AND CORPORATE RISK-TAKING

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Contents

List of Abbreviations

MSC	Managerial Social Capital
BOD	Board Of Directors
CEO	Chief Executive Officer
CFO	Chief Financial Officer
CGCs	Corporate Governance Codes
ESG	Environmental, Social, and Corporate Governance
OECD	Organisation for Economic Co-Operation and Development
OLS	Ordinary Least Squares Regression
RDT	Resource Dependence Theory
SOA	Sarbanes–Oxley Act
WVS	World Values Survey

Declaration

I certify that this work is presented for examination purposes for a PhD degree in Finance from the University of Kent. Accordingly, I hereby declare that the thesis is my own work. In addition, I confirm that I participated in the BAFA annual conference of 12–13 April 2021 and used the third essay when taking part in the ‘Sustainable Finance and Governance’ workshop on Monday, 17 May 2021, held in the Department of Economics, University of Bath, UK.

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Dedication

"الحمد لله رب العالمين والصلاة والسلام على سيدنا محمد خاتم الأنبياء والمرسلين"

وَقُل رَّبِّ زِدْنِي عِلْمًا

'O my Lord! Advance me in knowledge.'

To my parents, Abdel Mon'em and Ibtisam,

for their efforts and love.

To my Diya'a,

for her inspiration and patience.

To my brothers and sisters, Mohammad, Enas, Sana'a, Saddam

and Sarah,

for their love and support.

To the memory of my grandmother, Faddiah,

for encouraging me to learn.

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ABSTRACT

The literature on social capital and corporate financial decisions has attracted increasing interest from academia and corporate decision makers. However, the interest in social capital faces some obstacles, together with the lack of a unified measure of it, which add to the complexity of the studies that have considered the topic and related factors. In particular, the corporate finance literature asserts that social capital needs to be investigated carefully by considering its attributes in relation to corporate finance decisions (García-Feijóo et al., 2021; Oyotode-Adebile and Ujah, 2021; Hasan et al., 2020; Javakhadze et al., 2016b). Accordingly, this thesis adds to the extant literature by contributing three empirical essays on the relationship between social capital and corporate finance decisions.

The first essay investigates the relationship between managerial social capital (MSC) and corporate dividend policy with regard to FTSE 350 Index firms during the period 2006–2017. It is argued that the MSC alleviates information asymmetry and agency problems as a source of value and trust and a channel of information. Using data from the BoardEx database on executives and directors, the study builds an index of MSC based on four sources of connections: current employment, past employment, education, and other social activities. Coupled with financial data from the DataStream database, the study uses a sample of panel data that consists of 3638 firm-year observations. Logit and tobit estimations are employed after controlling for governance and financial variables to ascertain the relationship between MSC and corporate dividend policy. The findings suggest that MSC is a significant determinant of firms' dividend policy. The results are consistent with the substitution hypothesis, suggesting that firms distribute cash dividends to reflect a strong governance regime and to improve their reputation in the market. In addition, the results show that MSC facilitates access to information and the external environment, and that external directors can act as wealth creators.

The second essay examines the association between social capital and capital structure using unbalanced panel data for a sample of firms listed on the FTSE350 Index from 2006 to 2017. A multivariate regression framework is used, and the endogeneity problem controlled for to provide evidence of how social capital influences the capital structure of firms. After

addressing previous research findings, the study focuses on the structural dimension of social capital. Accordingly, in this essay, an MSC variable has been calculated. The results of the research are based on the generalized method of moments model, which is applied for all the sample firms, and then samples of financial and non-financial firms have been used. After controlling for the capital structure of the firm, as captured by the ratio of total debt to the book value of total assets, and that of total debt to the market value of total assets, the results show that MSC has a positive and significant effect on firms' capital structure. This positive effect is consistent with the pecking order theory, showing that structural social capital alleviates information asymmetry between management and shareholders, resulting in a moderation of the costs of issuing new debts to finance new projects. Then, social capital motivates managers to consider debt financing in firms' capital structure. In addition, the study shows that the positive relationship is consistent with the outcome hypothesis, implying that social capital works as a governance mechanism which provides a strong monitoring tool. In addition, the study indicates that social capital alleviates agency problems and reduces information asymmetry. Moreover, the results of this study show that financial firms are different from non-financial firms, as the regression results report no significant impact of MSC on the capital structure of the firm. Consequently, important recommendations are made for firms, managers, investors, policymakers and other users of financial information related to the use of social capital as a vital variable that must be taken into consideration with regard to firms' debt policy.

The third essay examines the relationship between social capital and corporate risk using unbalanced panel data of publicly listed UK FTSE 350 firms for the period 2006–2017. The relationship between social capital and corporate risk is assessed through a multivariate regression framework and control of endogeneity sources. The main sample used includes financial and non-financial firms, which has been separated to distinguish between the two types of firms. Previous studies are discussed, and interesting evidence is provided to demonstrate that the direction of the relationship is based on the social capital dimension. This notion has not been explored in the previous studies, particularly in the context of a robust empirical setting that appropriately controls for endogeneity concerns. The findings of the study show that social capital is negatively related to corporate risk-taking, and that this is true under the three types of samples, that is, all firms, non-financial firms, and financial firms. This negative relationship can be explained by agency theory, implying that MSC can enhance the monitoring function and emphasise the access to information. In addition, the reputation hypothesis provides some explanations for this relationship, which illustrate that a high level

of MSC forces managers to be concerned about their reputation in the external labour market, and this can make them more risk-averse. Furthermore, the results show that financial firms require further investigation in the future research. The results also indicate that social capital plays a role in shaping the effect of corporate governance and risk-taking. Accordingly, this study provides important implications for managers, firms and policymakers, and in particular, for prospective investors and analysts in relation to investment decisions and evaluation of firm risk. Moreover, the study demonstrates the importance of MSC in shaping future corporate governance regimes.

CHAPTER ONE

RESEARCH OVERVIEW

1.1 Introduction

Social capital has attracted the attention of various parties, such as policymakers, investors and academics, especially in the twenty-first century. In social science, several studies, including those of Bourdieu (1986b), Davis (1991), Putnam et al. (1994), Mizruchi (1996) and Woolcock (1998) have clearly established that it is a vital factor which affects economics and organisational growth. However, there have been contradictory outcomes and, in general, a lack of studies on how social capital can influence financial decisions when relevant information is being transformed into a rapid base and can dynamically change such decisions by firms (Hasan et al., 2020).

The concept of 'social capital' is widely used nowadays, but it is difficult to explain it in one general definition due to its nature as a multidimensional concept (Lins et al., 2017). From a qualitative standpoint, social capital is a subjective concept and it differs between the individual level and firm level (Hamdan et al., 2014). However, the increased interest in social capital is obvious. To illustrate this, Woolcock (2010) shows that during the late 1980s, the concept was used in scholarly literature fewer than 100 times in a year compared with 2008, when it was referred to approximately 16,000 times. This use grew continuously to reach 145,000 times per year in scholarly articles for the period 2009–2018 (Oyotode-Adebile and Ujah, 2021). In addition, well-known organisations on an international level play a significant role to explore social capital. For instance, the Organisation for Economic Co-operation and Development (OECD) pays great attention to achieve recognition of the concept of social capital, as represented by Scrivens and Smith (2013) working paper, which was funded by the European Commission (DG Employment) and assesses the concept and its measurement. In addition to the OECD, social capital has attracted the attention of the World Bank for many years, as it believes in its influence in society. Consequently, it developed an initiative to study social capital in India and Panama in 1999, with the government of Denmark assigning $1.2 million dollars to the project (Woolcock and Narayan, 2000). Accordingly, social capital needs to be investigated in different aspects, particularly in corporate finance (Hasan et al., 2017a).

However, in relation to corporate finance, more effort is needed to clarify the empirical influence of social capital on firms' financial decisions. In this vein, Oyotode-Adebile and Ujah

(2021) argue that social capital is underexplored in corporate finance literature. Nevertheless, several research studies show that social capital provides a valuable resource for firms via the connections of the boards of directors (BODs) from firm and/or individual levels (Horton et al., 2012). For instance, social capital can improve firm performance (Zona et al., 2018), reduce risk that resulted from managerial decisions (Ferris et al., 2017a), and affect dividend smoothing (García-Feijóo et al., 2021), firms' leverage (Huang and Shang, 2019), corporate social responsibility (Amin et al., 2020), financial development (Javakhadze et al., 2016a), and equity finance (Ferris et al., 2017b).

In general, it is not easy to define social capital, and this may contribute to the paucity of research investigating the association between social capital and corporate finance (Lins et al., 2017; Javakhadze et al., 2016b). Indeed, the concept of social capital is closely related to the social networks, and social capital is rooted in the social networks (Amin et al., 2020; Javakhadze et al., 2016b; Horton et al., 2012).

Consequently, despite the variations of social capital measures, social network capital is considered as a core measure of social capital. To illustrate this, social capital can be structural or cognitive[1] (Nahapiet and Ghoshal, 1998). The link between social capital and social network capital is rooted in the structural dimension of social capital. In this vein, Bourdieu (1986b) describes social capital as assets existing in a network. Accordingly, Bourdieu and Wacquant (1992) illustrate that the aggregate resources accrued by an agent or group of people who have durable connections in the form of a network that resulted from having a considerable relationship is a significant approach to represent social capital. Therefore, social network also asserts that social capital is a particular resource that can be formed between a network's participants (Hasan et al., 2020). Accordingly, the networks approach makes social capital a measurable variable under the social networks measures (Wasserman and Faust, 1994).

The most common and straightforward measure of connectedness is the degree of centrality measure which represents the summation of ties between nodes (individuals) that construct a specific network, and this thesis uses this measure to gauge social capital. Centrality measures are common measures used in the social network literature (Fracassi, 2017). Freeman (1979) illustrates three different measures of centrality, namely closeness, betweenness, and degree of centrality. In simple terms, the degree of centrality is the number of connections held by

[1] This thesis uses the structural dimension of social capital as measured in Javakhadze et al.'s (2016b) study since the cognitive dimension is not a prime objective in this thesis.

someone in a network that can represent the size of social connections held by someone, and it reflects the social capital of this person (Javakhadze et al., 2016b). Accordingly, Javakhadze et al. (2016b) illustrate that the volume of social capital for a specific agent depends on the degree of connections held by the agent, and it can be transferred in different forms. This definition of social capital comes from the structural definition (Bourdieu, 1986a). To the best of our knowledge, Javakhadze et al. (2016b) are the first that take the lead in corporate finance and social capital literature to clearly define social capital as the degree of connections for social networks.

In a related research study, Hasan et al. (2020) argue that social capital and corporate governance regime are mutually associated, and they suggest that this requires further investigation. This can be explained by the connections between directors and management, which can impact corporate strategic decisions; for example, the UK's 2010 Corporate Governance Code (CGC) illustrates that connections between board members and management (inside and outside the firm) have a significant effect on the firm's policies, and this is consistent with the findings of (Amin et al., 2020; Fracassi, 2017; Fracassi and Tate, 2012; Horton et al., 2012). Accordingly, with this complexity of social capital as a concept and its relationship with the corporate finance decision, this research adds to the extant literature by identifying and evaluating the effect of social capital on financial decisions, specifically, three related corporate finance decisions: the dividend policy, capital structure, and risk-taking decision.

This chapter presents an introduction to the thesis, beginning with a brief discussion of the research background and motivation, followed by the aims, objectives, and research questions, a preview of the data and research methods, the contribution of the thesis, and finally, the thesis structure and a summary of the findings.

1.2 Background and motivation

Social capital has several definitions and measures; however, it is agreed that it is an embedded asset created through social networking. Therefore, social networking between groups of people can grow in workplaces, schools and universities, online through social media websites such as Facebook and LinkedIn, and through social activities such as participating in charity work, sports clubs, or other social activities (Van Dijck, 2013; Wasserman and Faust, 1994).

Social networks can be created in the business world for certain purposes. This thesis focuses on those between directors and executives in different firms. However, the concept of social

capital in business is rooted in director networks, which are also referred to as interlocking directorates between firms. In this case, an agent (director) serves on the BOD of a specific firm and also on that of another firm. Director networks are considered in terms of two levels: the individual level and the firm level. If two directors are serving on the same BOD, this will represent the individual level of interlocking, whereas the firm level of interlocking exists when two firms are connected through a shared director or directors. Interlocking directorates have attracted the attention of the regulatory bodies in the US, which have adopted the Clayton Act of 1914 to restrict possible collusion between director networks (Renneboog and Zhao, 2013). Many scholars have explored the effect of director networks on firm performance, including (García-Feijóo et al., 2021; Zona et al., 2018; Horton et al., 2012; Renneboog and Zhao, 2011; Mizruchi, 1996; Useem, 1984; Koenig et al., 1979).

Nevertheless, interlocking directorates are not the primary interest of this thesis, as it investigates social capital, which, in the business world does have its roots in director networks. In addition to director networks, social capital can be established through educational networks, club memberships, charity work, shared interests in sports, and other social activities.[2] Although it is clear that social capital studies have already examined director networks, these are not the sole component of social capital; social networks can represent structural social capital, which has a cognitive dimension originating from shared languages, codes, narratives, values, attitudes, beliefs, goals, purposes, and visions (Nahapiet and Ghoshal, 1998).

Indeed, some studies refer to director networks and social capital interchangeably, which makes it more difficult to discriminate between the two concepts. However, social capital encompasses a broader scope than interlocking directorates. For example, 'social capital refers to the norms and networks that enable people to act collectively' (Woolcock and Narayan, 2000, p.225). Accordingly, the social network of a specific person, which involves the exchange of information, norms and trust, represents the individual's social capital, and this is determined by the aggregate number of connections held by them, and the size of the network is the sum of their ties (Woolcock, 1998). In this respect, social capital can be considered as a source of social commitment through social networks, which also provide informal contacts. In addition, social capital can be defined as the 'resources embedded in a social structure which are accessed and/or mobilized in purposive actions' (Lin, 2002, p.29). Accordingly, social capital has been studied in different disciplines, including sociology (Portes, 1998), politics

[2] Social networks can be created online through social media, but this is beyond the scope of this thesis.

(Putnam et al., 1994), and economics (Putnam, 1995). In relation to economics and business, social capital plays a role in explaining agency problems (Amin et al., 2020; Guiso et al., 2004). Moreover, in corporate finance, social capital is used as a vital factor to explain certain aspects, such as risk-taking, cash flow sensitivity, cash holdings, asymmetric information, and mergers and acquisitions (Hartlieb et al., 2020; Ferris et al., 2019; Javakhadze et al., 2016b; El-Khatib et al., 2015; Tuugi et al., 2014).

Social capital is a multidimensional concept with many determinants and levels, as well as various definitions that stimulate its application in different disciplines. Consequently, in addition to social network attributes, social capital has another important attribute that is evident from its definitions. For instance, the paper supported by the OECD by Scrivens and Smith (2013) identifies four main approaches that can be conceptualised and used to measure social capital: personal relationships, social network support, civic engagement, and trust and cooperative norms. These four aspects can be distinguished from each other, but they also have some common attributes. For instance, personal relationships refer to the formation of people's networks, and the social network support aspect is the outcome of the first aspect. On the other hand, the civic engagement and trust and cooperative norms aspects are interrelated under the trust aspect. Accordingly, Lins et al. (2017) argue that the first two aspects are more popular in sociology and the other two are popular in politics and economics.

Based on the social capital theories, Javakhadze et al. (2016b) argue that in corporate finance, it is common to use two dimensions of social capital: the structural and cognitive dimensions. The cognitive dimension can be explained under the rational choice approach illustrated by Coleman (1988), and it is also explained under the collective asset view illustrated by Putnam et al. (1994). This dimension is closely related to shared norms, trust, ways of thinking, ideation, values and attitudes, beliefs, and reasoning. The structural dimension has evolved based on the work of Bourdieu (1986b) and was later advanced by Lin (1999). On the other hand, the structural dimension is closely related to social networks and connections between network participants.

Accordingly, Javakhadze et al. (2016b) assert that social capital can be measured under the structural dimension by the size of social networks, or what is called degree centrality; they state that in corporate finance studies, 'researchers are reluctant to use the term "social capital" and refer to network effects or the advantages resulting to one's social networks' (Javakhadze et al., 2016b, p.44). In addition, Hasan et al. (2020) argue that the characteristics of social

capital that can influence the outcomes of financial decisions are embedded by four channels: the information through networks, network-induced risk preference, social capital as a governance institution, and social capital as a channel to facilitate generalised trust. As illustrated by Hasan et al. (2020), the first two channels are generally used to explore individual and firm social capital, whereas the other two commonly pertain to the economic benefit of social capital for nations, regions, and individuals. As can be seen, Hasan et al. (2020) classification of social capital attributes is relatively similar to the structural and cognitive dimensions detailed by (Javakhadze et al., 2016b).

Based on the social capital attributes, some papers provide empirical evidence of the roles of social capital. For example, social capital strengthens the building of a good reputation through honest dealings in the financial markets by increasing the fears of loss of reputation for those who execute transactions, thus working as a disciplinary and monitoring mechanism (Kandori, 1992). In addition, Coleman (1988) argues that social capital enhances group cooperative behaviour through the existence of more connections (dense social networks). Moreover, cooperative behaviour within a social network provides an alternative tool for conflict settlement, which helps to mitigate the consequent costs of legal intervention (Javakhadze et al., 2016b). However, the association between social capital and corporate finance has not received significant attention, which limits the understanding of the socio-economic effect of such a dynamic factor. Accordingly, Hasan et al. (2020) assert that social capital needs to be investigated with consideration of its different dimensions; therefore, there is a need for more empirical evidence to clarify its role in economics and finance.

1.3 Study aims, objectives, and research questions

On the basis that there is a lack of research on the association between social capital and financial decisions, this thesis aims to identify and evaluate this association. The study sample consists of publicly listed UK FTSE350 firms.[3] The study attempts to fill the gap in the literature by providing empirical evidence of the association between financial decisions and social capital. In this sense, it is argued that social capital affects the dividend policy, capital structure and risk-taking decisions of firms. Indeed, the importance of social capital is due to its ability to facilitate social exchanges; without social capital, it is difficult to have a connected society, an exchange of economic values, and solid political systems, so it is interesting to investigate social capital in relation to financial decisions. Equally important, this thesis

[3] The FTSE 350 Index constitutes more than 96% of the overall market capitalisation in the UK (Factsheet, 2018).

considers the nature of the social capital variable, which is based on the social connections since financial firms such as banks play an important role in building social connections (Brunetti et al., 2019; Engelberg et al., 2012). Therefore, this thesis contributes to the extant literature by considering financial and non-financial firms jointly in the sample firms; thereafter, it illustrates the impact of the financial and non-financial firms separately on the main estimations of the thesis chapters.

The three empirical chapters are interrelated and connected to social capital. To illustrate this, the dividends decision is strongly affected by information flow, which is expected to be affected by the ability of social capital to accelerate the flow of information (García-Feijóo et al., 2021; John and Williams, 1985). In addition, coupled with the association between dividend policy and the capital structure decision, social capital characteristics are expected to influence the financing sources of the firm (Huang and Shang, 2019; Al-Najjar, 2011; Shyam-Sunder and Myers, 1999; Chang and Rhee, 1990). Thereafter, changes in the financing structure of the firm are expected to influence the firm's risk-taking decision (Ferris et al., 2017a; Aggarwal and Goodell, 2014a; Li et al., 2013; Nenova et al., 2000). Accordingly, this thesis continues to provide additional empirical evidence to elucidate the relationship between social capital and risk-taking. Furthermore, social capital has a significant role in monitoring and control (laPorta et al., 1998; Kandori, 1992). Therefore, in addition to the financial variables, this thesis includes a set of corporate governance variables (Hasan et al., 2020; Davis and Greve, 1997).

In simple terms, this study follows previous studies to identify a research gap following the call of Al-Najjar and Belghitar (2014) for investigations into the relationship between social capital and dividend policy. Subsequently, intuitively, it continues to explore the relationship between social capital and capital structure based on the strong association between dividends and capital structure. Finally, outcomes from the first and second empirical chapters provide additional motivation to investigate the relationship between social capital and risk-taking decisions, as they postulate that financing source impacts risk-taking. This thesis connects the three empirical chapters to provide comprehensive evidence of the association between social capital and corporate finance decisions to fill the existing research gap.

Consequently, this thesis uses the social networks approach to provide a quantum measure of social capital (Goergen et al., 2019; Javakhadze et al., 2016b; Freeman, 1979). In addition, this thesis has four main objectives:

1- To provide empirical evidence of the relationship between social capital and dividend policy.
2- To provide empirical evidence of the relationship between social capital and capital structure.
3- To provide empirical evidence of the relationship between social capital and corporate risk-taking.
4- To examine the difference between financial and non-financial firms, under the three corporate finance decisions (dividend policy, capital structure, and corporate risk-taking) in relation to social capital.

Accordingly, this thesis uses the social networks approach to provide a quantum measure of social capital to answer the following research questions:

- How can social capital defined under the social networks approach affect the firm's dividend policy in the FTSE 350 firms?
- Does the effect of social capital on the dividend policy differ in the financial and non-financial firms?
- How can social capital defined under the social networks approach affect the firm's capital structure in the FTSE 350 firms?
- Does the effect of social capital on the capital structure differ in the financial and non-financial firms?
- How can social capital defined under the social networks approach affect the firm's corporate risk-taking in the FTSE 350 firms?
- Does the effect of social capital on the corporate risk-taking differ in the financial and non-financial firms?
- Does corporate governance have a significant impact on the relationship between social capital and corporate finance decisions?

1.4 Data and research methods preview

This thesis uses data from publicly listed UK FTSE 350 firms during the period 2006–2017. This period was characterised by the development of several governance codes, particularly in relation to the ties and relationships between the members of BODs. Therefore, the data were gathered from two primary resources, BoardEx and DataStream. Bearing this in mind, the thesis consists of three essays, with each following previous research to select the appropriate research method that will help to answer the research questions. Accordingly, the first essay

(Chapter two) examines the association between social capital and dividend policy. Chapter two uses tobit and logit models to investigate this relationship; consequently, it accounts for variables that have positive or zero values in the dependent variable by employing the tobit model. In addition, to predict the estimates of dichotomous values of dividends that have a value of zero or one, the logit model is used. The endogeneity concern is considered by using the lagged values of the control variables in each model.

For the second and third essays (Chapters three and four), the GMM model is employed. Previous research has usually accounted for endogeneity concerns by implementing the instrumental variables method (Wintoki et al., 2012). However, at times, it is not straightforward to find a suitable instrumental variable, which must be a strict exogenous instrument (Flannery and Hankins, 2013; Wintoki et al., 2012). In the corporate finance area, other traditional estimation methods, such as the Ordinary Least Squares regression (OLS) and fixed-effects models, have been used extensively, but they may sometimes produce biased and inconsistent outcomes (Flannery and Hankins, 2013). For instance, although the fixed-effects model can deal with unobserved heterogeneity, it fails to control dynamic endogeneity (Wintoki et al., 2012). Consequently, the use of the dynamic panel generalised method of moments (system GMM) estimator provides a strong technique to control for endogeneity sources, resulting in a consistent outcome.

1.5 Study contribution

As mentioned briefly in the previous sections and by reviewing the literature that explores the association between social capital and corporate finance,[4] this thesis contributes to and advances the knowledge of social capital and finance decisions, in which the dynamic nature of social capital can significantly influence the corporate finance arena. Consequently, the study addresses the current gap in the related research and provides real-world value to interested parties, such as market regulators, investors, and academia, as well as to firms operating in such a dynamic environment. Accordingly, it contributes to the literature in several other aspects, as detailed below.

Chapter two contributes to the corporate finance literature by investigating the association between social capital and dividend policy. Previous studies show that social capital is a source of economic growth, performance, effective production, and competitive advantage, and is an

[4] Further details of the literature review are provided later to fit the aim of each paper in the study.

important resource for firms. In addition, social capital facilitates information transfer, enhances the monitoring function, and alleviates asymmetric information in addition to its institutional influence (Ferris et al., 2017b).

Previous studies argue by that dividend policy is a complicated issue which is influenced by several factors; these factors can be financial or non-financial, such as culture and the environment, religion, corporate governance, the growth of the firm, debt sources, and risk-taking (Ucar, 2016; Hussainey et al., 2011; Farinha, 2003; Fama and French, 2002; La Porta et al., 2000). Therefore, dividend policy has been described as a puzzle because of its complexity (Black, 1976). Consequently, a plethora of studies have attempted to answer the question of why firms pay dividends to shareholders. However, given the crucial role of social capital in firms' strategic decisions, its potential influence on dividend policy, which is an important financial policy decision in the context of agency theory, has not be explored. Therefore, this paper argues that structural social capital can be defined under MSC,[5] which is measured by the social networks between the key figures in a firm, the directors and executives, who can influence the firm's dividend policy. Accordingly, this chapter contributes to the field of study that emphasises the importance of non-financial factors in determining dividend policy. The results obtained in this paper are consistent with the substitution model suggested by La Porta et al. (2000). Furthermore, the paper strengthens the importance of social capital as a channel of information, which improves information asymmetry, reduces agency costs, and enhances firm performance (Ferris et al., 2017b; Engelberg et al., 2013).

In addition, this chapter provides a deep investigation related to the main research question of the chapter by using the interaction effect between corporate governance and MSC, which has a significant effect on the firm's dividend policy. Moreover, this chapter uses three samples, which adds to previous works by considering the financial and non-financial firms in comparison with all the firms in the sample. Taken together, social capital is a determinant of dividend policy that should not be ignored, as it benefits important functions in the firm and results in lower agency costs (Rozeff, 1982).

Chapter three contributes to the corporate finance literature by investigating the association between social capital and the capital structure of the firm. According to Modigliani and Miller (1958) irrelevance proposition, financing sources are irrelevant to firm value in perfect capital

[5] This thesis uses structural social capital as scaled by MSC.

markets. Others focus on how financing choices affect such value in imperfect markets or under prevailing asymmetric information or agency problems.

Capital structure is a very important financial decision that has been explored from different perspectives. For instance, Mehran (1992) considers executive incentive plans, Aggarwal and Goodell (2014a) consider it from cultural and institutional perspectives, Kieschnick and Moussawi (2018) relate it to corporate governance, and Ferris et al. (2018) examine it in relation to market value. These studies are led by several theories, such as pecking order theory (Myers, 1984; Myers and Majluf, 1984), trade-off theory (Myers, 1984; Kraus and Litzenberger, 1973), agency theory (Jensen and Meckling, 1976), and market timing theory (Baker and Wurgler, 2002). In general, pecking order theory and trade-off theory provide the main line of thought for capital structure studies (Alves et al., 2015). Accordingly, some studies investigate how a firm's capital structure can be affected by several factors.

Social capital has several attributes that make it important for a firm's financial decisions; however, the effect of this has not been considered adequately in relation to the firm's capital structure. Few works examine relationships of this type and are limited to specific aspects of social capital, ignoring its different dimensions. For instance, Fogel et al. (2018) consider the Chief Financial officer(CFO) connections in relation to the firm's private debt, while Huang and Shang (2019) consider social capital in association with leverage and short-term debt ratios at the county level.

Consequently, this paper argues that social capital can affect the capital structure of the firm. Accordingly, it adds to the literature on capital structure by addressing social capital as a determinant of a firm's capital structure. It then shows that social capital influences capital structure choice. In other words, firms with a higher level of social capital can gain better access to sources of finance to fund their operations. Moreover, this is consistent with pecking order theory (Myers, 2003), in which the existence of social capital can alleviate the degree of information asymmetry, allowing firms to choose to use debt financing instead of equity, which also results in lower financing costs. In addition, the results of this paper are consistent with the outcome hypothesis (La Porta et al., 2000). Furthermore, this chapter acknowledge the importance of financial firms in building social capital highlighted in the previous studies. Therefore, the main sample has been divided into additional samples that categorise the financial and non-financial firms separately. However, the financial firms show no effects of MSC on the firm's capital structure, which might be considered in future research. However,

this chapter adds to the literature on capital structure by addressing social capital as a determinant of the firm's capital structure.

Therefore, this paper adds to the current knowledge on social capital and capital structure by providing empirical evidence of the effect of social capital on capital structure by using different measures of social capital. Furthermore, this paper demonstrates that MSC alleviates information asymmetry, which is consistent with Tuugi et al. (2014) paper. Indeed, the findings of this chapter are in line with the results from Chapter two, showing that social capital is a key determinant of capital structure, as it alleviates information asymmetry and enhances monitoring mechanisms and the channel of information transfer, so it is a means of enhancing firm performance (Huang and Shang, 2019; Fogel et al., 2018; Hasan et al., 2017b). Moreover, these findings are in line with previous findings in relation to social capital characteristics, which postulate that friends with money are crucial in financing decisions (Fan et al., 2019; Engelberg et al., 2012).

After considering the effect of social capital on dividend policy and capital structure, it is intuitive to ask how social capital can affect corporate risk-taking decisions. Therefore, Chapter four contributes to the corporate finance literature by investigating the association between social capital and corporate risk-taking. This chapter argues that social capital can eliminate the ambiguity which affects the uncertainty that surrounds business activities. The paper uses idiosyncratic risk and total risks to examine the effect of social capital on corporate risk-taking. Social capital eliminates ambiguity because of its ability to provide an informal mechanism for safe dealing between socially connected participants, which, in turn, alleviates risk (Bloch et al., 2008). However, previous evidence is limited to the Chief Executive officer (CEO) social capital and/or that of countries, which can result in different financial outcomes (Hasan et al., 2020). Keeping this in mind, social capital has the ability to alleviate information asymmetry and reduce agency costs; under the imperfect market hypothesis, it is a source of information that enhances the efficient completion of financial contracts (Javakhadze et al., 2016b). This chapter finds that structural social capital can alleviate corporate risk-taking and that a greater number of social ties results in less risk-taking. Accordingly, this chapter advances the extant knowledge by addressing the association between social capital and corporate risk-taking.

Consequently, the negative relationship between structural social capital and corporate risk-taking is in line with agency theory, in which social capital attributes enhance the monitoring function, thus reducing agency costs. In addition, the negative effect can be interpreted under

the reputation model, in which managers may decide to ignore some projects to concentrate on reputation building, and because of fears of loss of reputation, they do not take projects with an excess level of risk (Gupta et al., 2018; Ferris et al., 2017b; Hirshleifer, 1993; Kandori, 1992). Moreover, this paper extends the model of estimation by including the risk committee as a control variable, where the relationship between social capital and corporate risk-taking has not been changed, which provides additional verification of the association between social capital and corporate risk-taking. Importantly, this chapter provides evidence based on the financial and non-financial firms in comparison to the sample of all the firms. Accordingly, the results indicate a significant negative effect between social capital and corporate risk-taking in all the used samples; therefore, these results suggest that financial firms are not different from non-financial firms in relation to social capital and risk-taking. However, this is different from the second and third chapters, where the tested relationships are not significant using the financial firms sample. Consequently, this chapter calls for more investigations into the relationship between corporate risk-taking and social capital under different dimensions of social capital and other theories (Zona et al., 2018; Hillman and Dalziel, 2003). Moreover, financial firms might be considered with more careful considerations of the risk-taking and social capital, particularly the ability of these firms to create more connections and at the same time the consequences of stopping dealing with financial firms on other firms (Dbouk et al., 2020).

1.6 Thesis structure and summary of findings

The thesis is mainly based on three empirical papers, which are distinguished from each other by the consideration of three major corporate finance topics in relation to social capital. In addition to this chapter, the thesis comprises four chapters.

The first paper of the thesis is presented in Chapter two, which considers the relationship between social capital and dividend payout policy. Generally, previous studies illustrate that social capital is a source of discipline and a monitoring mechanism which supports the institutional role of social capital as a governance mechanism for firms. The related literature suggests that links between corporate governance regimes and dividend policy are explained by the substitution hypothesis or complementary hypothesis.

The substitution hypothesis suggests that a good corporate governance mechanism is a substitute for a dividend payout in alleviating agency costs. The empirical evidence in this paper indicates that the MSC formed from networks among directors and executives is a

substitute for paying dividends to avoid costly external financing. In this light, MSC is a source of monitoring that reduces the need for signalling to the market through the distribution of dividends, and directors/executives with good connections have good social capital, which creates a sufficient reputation in the market and reduces the need to distribute dividends to shareholders. Consequently, having a good reputation in the market through MSC reduces agency costs. Overall, this chapter indicates a significant impact of social capital on the dividend policy of the firm.

The second empirical paper is presented in Chapter three. This chapter considers social capital from the structural dimension. Motivated by the results in Chapter two, it explores the association between the social capital and the capital structure of the firm. Generally, the empirical literature which considers the structural dimension of social capital asserts that social capital is embedded in the social networks that exist among employees (Javakhadze et al., 2016b; Fracassi and Tate, 2012; Horton et al., 2012). Indeed, despite the evidence that social capital influences firm performance, productivity and economic growth, the empirical evidence continues to show some ambiguity and divergence of measures concerning how social capital is related to financial decisions (Hasan et al., 2020; Horton et al., 2012). Therefore, the door is open for further investigations into the relationship between social capital and financial decisions (such as capital structure). Accordingly, Chapter three investigates the effect of social capital on the capital structure of the firm under the structural dimension (social networks between the key directors and executives). Accordingly, this chapter employs book and market leverage measures to provide a significant estimation, then, as noted by the analyses from Chapter three, social capital increases firms' debt ratio. This result is explained by the pecking order theory, according to which firms with information asymmetry problems are expected to use internally generated funds to fund new projects as the first option, and then may choose to use external debt and avoid issuing new equity, while equity issuance is the least preferred option (Myers and Majluf, 1984). In addition, the results of this chapter are consistent with the outcome hypothesis, in which poor governance quality is associated with the use of a suboptimal level of debt, and a strong governance mechanism is positively associated with the use of debt financing. Moreover, the paper shows that the tested relationship is not significant with the use of the financial firms sample, which may relate to special characteristics connected to financial firms.

The third paper, which is presented in Chapter four, investigates the effect of social capital on corporate risk-taking. An extensive body of research implies that risk-taking differs depending

on different board structures and different environmental conditions (e.g., Illiashenko and Laidroo, 2020; Akbar et al., 2017; Lins et al., 2017). However, the empirical evidence of the relationship between social capital and risk-taking has not been significantly explored, and the previous studies have certain limitations. For instance, Ferris et al. (2019) consider CEO social capital and the risk-taking, while Panta (2020) uses a county level of social capital to examine the relationship between social capital and risk-taking decisions. Moreover, previous studies have provided contradictory evidence of the relationship between social capital and risk-taking decisions, which might be a result of insufficient distinguishing between the financial and non-financial firms (Akbar et al., 2017).

This research uses some important risk measures that are related to firm-specific characteristics as well as the total risk measure. In particular, this chapter employs idiosyncratic risk using the market model and capital asset pricing model (CAPM). Generally, it is well documented in the literature that these two sources of risk are the most commonly used variables to estimate corporate risk-taking.

The results show that structural social capital, as defined by MSC, is negatively related to corporate risk-taking. Accordingly, this is consistent with agency theory explanations, in which social capital improves information transfer, reduces information asymmetry, and consequently mitigates agency problems by reducing agency costs. In addition, this negative relationship is consistent with the reputation model, in which managers try to avoid unnecessary risk.

Chapter five summaries the results of the major empirical analysis of the thesis. In addition, the chapter presents the overall conclusions and implications and provides recommendations for future research.

CHAPTER TWO

MANAGERIAL SOCIAL CAPITAL AND FIRMS' DIVIDEND POLICY: UK EVIDENCE

A B S T R A C T

This study aims to investigate the relationship between managerial social capital (MSC) and corporate dividend policy. It argues that MSC mitigates information asymmetry and agency problems as a source of value and trust and a channel of information. Using biographical information on executives and directors of UK firms, the study constructs a proxy of MSC based on current and past employment, education, and other social activities. Along with financial data on FTSE 350 Index firms from 2006 to 2017, it develops a final panel data sample that consists of 3,638 firm-year observations in the main study model; however, the sample firms are divided into financial and non-financial firms to provide a better insight into the differences between the two types of firms. Accordingly, after controlling for governance and financial variables, logit and tobit estimations are used to investigate the relationship between MSC and dividend policy. The findings suggest that MSC is a significant determinant of firms' dividend policy. In addition, the results differ for the non-financial and financial firms. However, the results are consistent with the substitution hypothesis, implying that firms distribute cash dividends to reflect a good governance system and to enhance their reputation in the market. The results also show that MSC facilitates access to information and the external environment and that external directors can work as wealth creators. The overall results are based on a robust methodological approach, which deals with the endogeneity problem, and acknowledge the expected effect that may result from the association between social capital and governance.

Keywords: dividend policy, managerial social capital, corporate governance, social connections, social networks

2.1 Introduction

This chapter investigates the relationship between MSC and the firm's dividend policy. Several research studies in corporate finance consider the association between behavioural factors such as social capital and financial policies (e.g.,García-Feijóo et al., 2021; Huang and Shang, 2019; Chen et al., 2017a; Larcker et al., 2013). Social capital has two main dimensions: structural and cognitive.[6] Putnam et al. (1994, p.167) define social capital as 'features of social organization, such as trust, norms, and networks that can improve the efficiency of society by facilitating coordinated actions'. This definition represents the cognitive dimension, which is very similar to the World Bank's definition of social capital: 'social capital refers to the norms and networks that enable people to act collectively' (Woolcock, 2000, p.226). More interestingly, from the structural-social capital point of view, Bourdieu (1986b) argues that the size of an agent's network can determine the volume of social capital possessed. Social capital has been investigated in various disciplines, such as political science, anthropology, sociology, and economics (Schneider, 2006; Dasgupta, 2005; Portes, 1998; Knack and Keefer, 1995; Putnam, 1995).

Extant literature shows that social capital can significantly affect a firm's corporate governance and policies (Hasan et al., 2020). Nevertheless, social capital created through social networks between directors and executives, such as dividend policy, capital structure, corporate governance and firm performance, has not been investigated adequately in the literature (García-Feijóo et al., 2021; Oyotode-Adebile and Ujah, 2021; Lins et al., 2017). However, dividend policy is a key financial decision taken by firms; therefore, a huge number of theoretical and empirical studies, which examine the variations in dividend policy and its determinants, attempt to provide reasonable explanations for this decision. However, studying the association between dividend policy and social capital can contribute to easing the significant ambiguity that is surrounding dividend policy (García-Feijóo et al., 2021; Farinha, 2003; Black, 1976). To illustrate this, a large body of works investigate dividend policy under different theories; for example, Easterbrook (1984) and (La Porta et al., 2000) use agency theory, Asquith and Mullins Jr (1986) and Baker and Wurgler (2004) use signalling theory, and Dhaliwal et al. (1999) use tax clienteles to explain the association between dividend policy and numerous financial decisions.

[6] This study focuses on the structural dimension of social capital. In this vein, García-Feijóo et al. (2021) illustrate that in comparison with the cognitive dimension of social capital, the structural dimension requires further investigations in corporate finance.

Accordingly, this research builds on previous works that seek to consider social networks in relation to dividend policy (García-Feijóo et al., 2021; Al-Najjar and Belghitar, 2014). Keeping that in mind, social capital is a source of value and a control mechanism, and it enhances information flow and alleviates information asymmetry (García-Feijóo et al., 2021; Hasan et al., 2020). Therefore, this research uses the substitute hypothesis as suggested by agency theory (La Porta et al., 2000).

It is well established that the irrelevance theory of Miller and Modigliani (1961), which works on the basis of perfect capital markets, assumes no information asymmetry, no agency costs and no tax, implying that dividend policy does not affect the value of a firm. Consequently, several theoretical and empirical studies have been conducted to explain dividend policy, and what is known later through the Modigliani-Miller theorem (M&M). In a related context, the agency model of dividends illustrates that the distribution of dividends at the discretion of managers helps to alleviate the agency problem between them and shareholders by forcing firms to interact repeatedly within the capital market to seek external financing (Gomes, 2000; Easterbrook, 1984; Rozeff, 1982). For instance, Rozeff (1982) argues that an inadequate monitoring mechanism could be covered (substituted) by the distribution of cash dividends. Additionally, under the free cash flow hypothesis of Jensen (1986), managers tend to reduce cash distributions to use them in the future to finance positive net present value (NPV) projects. Overall, managers implicitly agree that cash dividends are costly.

According to agency theory, the BOD is a leading participant in alleviating conflicts of interest between shareholders and managers and is in charge of monitoring and approving decisions taken by managers (Fama and Jensen, 1983). Various studies have explored the relationship between corporate governance and firms' dividend policy, such as that between dividend policy and the gender composition of the board (Chen et al., 2017b), board independence (Sharma, 2011; Al-Najjar and Hussainey, 2009), ownership concentration (Setia-Atmaja et al., 2009), and co-opted directors (Jiraporn and Lee, 2017). These studies have added to the literature on dividends that investigates the determinants of dividend policy (Fatemi and Bildik, 2012; Denis and Osobov, 2008; Farinha, 2003; Fama and French, 2001; La Porta et al., 2000). In addition, at the macro level, socio-economic factors have been examined. More specifically, these studies include the perspectives of culture, religion, region, and norms. For instance, Shao et al. (2010) investigated how national culture influences dividend policy. Ucar (2016) added the cultural aspect to dividend policy and Davaadorj (2019) investigated the relationship between regional social capital and dividend policy. Overall, these studies show that non-monetary

factors influence personal managerial attributes, making them less opportunistic, with the tendency to save available cash to reduce agency and capital costs. Consequently, according to Hasan et al. (2020), social capital characteristics that enhance monitoring, reduce information asymmetry and build a good reputation in the market, in addition to its ability to empower trust between participants in the market, can significantly affect the decision-making process in firms. In this regard, Ucar (2016) and García-Feijóo et al. (2021) argue that dividend policy can be affected by the attributes of social capital. Therefore, it is important to determine how social capital attributes among BODs and management teams can affect dividend policy through implicit social networks (Wasserman and Faust, 1994).

To illustrate this, studies in finance reveal that MSC alleviates information asymmetry and agency cost problems (Ferris et al., 2017b; El-Khatib et al., 2015; Faleye et al., 2014; Cai and Sevilir, 2012; Cohen et al., 2008). The asymmetric information model in the signalling hypothesis (Bhattacharya (1979) implies that managers hold better information than the outside investors about a firm's financial position and future cash flows, and that dividend policy works as an efficient tool to signal to market participants about a firm's financial position. Therefore, dividend policy is a reliable means to transfer information about a firm's value and performance (Al-Yahyaee et al., 2011; Bhattacharya, 1979). This implies that dividend signalling should be low (or high) among firms that have a low (or high) degree of information asymmetry. On the other hand, Pfeffer (1987) suggests that socially connected directors are good monitors, controlling agency costs by acting in the best interest of shareholders, while social capital is a means of trust (Dasgupta, 1988) and associated with the managerial concern of losing their reputation in the market (McMillan and Woodruff, 2000; Kandori, 1992). Similarly, Ferris et al. (2017b) highlight that MSC alleviates information asymmetry and agency problems by reducing the cost of equity. Accordingly, by considering the substantial attributes of social capital, this chapter conjectures that social capital can affect the dividend policy of the firm. Equally important, as these attributes of social capital are crossing with corporate governance characteristics, this study follows the recommendations of Hasan et al. (2017a) and Hasan et al. (2020) to explore the interaction between social capital and a firm's corporate governance in the firm's dividend policy decision. Furthermore, previous studies assert that dividend policy and corporate governance are significantly affected by each other (Jiraporn and Lee, 2017; Sharma, 2011; Chae et al., 2009). Therefore, this study contributes to the growing body of research on the importance of MSC in corporate finance by studying how

it influences firms' dividend policy (e.g.,García-Feijóo et al., 2021; Chen et al., 2017b; Farinha, 2003; La Porta et al., 2000).

To test this relation, this study uses a panel dataset of FTSE 350 Index firms during the period 2006–2017. The study encompasses both non-financial and financial sectors. However, the estimated models are used for each sector independently for comparison purposes and jointly in a separate model, namely three models are based on the sectors: all firms, non-financial firms, and financial firms. In addition, the MSC measured using data from the BoardEx database (Javakhadze et al., 2016b; Engelberg et al., 2012; Fracassi and Tate, 2012) is used to build a social network index to measure MSC based on employment, education, and other social activities. Using a sample from the UK, a panel dataset has been used, and by considering the endogeneity problem, this chapter shows that the relationship between dividend policy and MSC is negative, that is, firms with a higher degree of MSC are reluctant to pay higher dividends. This evidence is in line with the substitution hypothesis (La Porta et al., 2000).

This chapter makes a number of important and original contributions to the literature. First, it adds new empirical evidence to the dividend policy literature by using a new unexamined factor, namely MSC. Previous research has studied the effect of numerous non-financial variables (e.g. culture, religion, region and norms) on dividend policy. Second, it encompasses a large dataset from UK FTSE 350 firms covering a long period. Additionally, it adds to the growing body of research in the social capital literature. Furthermore, it uses a strong research methodology with robust results of two alternative measures and models and, importantly, it deals with the interaction effect between MSC and governance variables based on the common functions between social capital and governance (Hasan et al., 2020). Finally, this chapter provides additional explanations of the association between dividend policy and social capital under the financial and non-financial firms. To the best of my knowledge, this is the first work to provide evidence of the relationship between MSC and corporate dividend payouts in the UK.

The chapter proceeds as follows. Section 2.2 presents the literature review and testable hypotheses. Section 2.3 discusses the sample, model, and variable construction, while Section 2.4 presents the empirical findings and the related discussion. Finally, Section 2.5 provides the conclusion to the chapter.

2.2 Literature review and hypotheses development

2.2.1 Managerial social capital (MSC) and dividend policy

The financial market is affected significantly by heterogeneous problems. These problems can be in different forms, such as agency problems, information asymmetry, and market monitoring and control problems (Hoi et al., 2019; Ferris et al., 2017b; Tuugi et al., 2014; Fidrmuc and Jacob, 2010; Fama, 1980). However, numerous research studies have attempted to provide rational explanations for the psychological, behavioural and societal influences in financial markets and corporate decisions (Johnson et al., 2013). As the socio-economic effects in financial markets are dynamic and changing rapidly, updated research is required to provide a reasonable understanding of social influences on a firm's financial decisions (Rupasingha et al., 2006). For instance, García-Feijóo et al. (2021) argue that dividend policy can be affected by social capital; therefore, it should be considered in relation to dividend policy. As a matter of interest, in their seminal work, Miller and Modigliani (1961) investigated the association between dividend policy and a firm's value, which is a debated topic in finance, that is based on a set of assumptions about the capital market and firm value, and it has been followed by a considerable stream of works in corporate finance.

Accordingly, since the seminal work of Miller and Modigliani (1961) was published, a large body of literature has investigated dividend policy determinants. These studies consider firm-specific factors (such as firm size, profitability, debt structure, growth, risk, liquidity, and growth opportunity), corporate governance factors (such as ownership structure, board composition, and board characteristics), and non-financial factors (such as culture, religion, geography, and norms). Nevertheless, dividend policy remains a topic of research interest in finance. Black (1976, p.5) describes the attempt to understand dividend policy as a 'dividend puzzle' and notes: 'The harder we look at the dividend picture, the more it seems like a puzzle, with pieces that just don't fit together'.

However, under the umbrella of agency theory, self-serving managerial behaviour (Eisenhardt, 1989) proposes that people who are in charge and control and monitor firm management (agents) can use their authority to benefit themselves from the firm's available resources, which can result in misuse of the firm's resources and harms the wealth maximisation objective of shareholders (principals). This misuse of resources ranges from overconsumption, transfer pricing, excessive compensation, issuing additional securities to relatives, and the use of dividends (La Porta et al., 2000; Shleifer and Vishny, 1997). Cash dividends limit the available

cash for managers and expose the firm to more legal constraints through market security. Therefore, the agency model of dividends ensures that dividend policy aligns agents' interests with those of the principals. However, Ferris et al. (2003) show that under the busyness hypothesis, firms may have a poor monitoring system, which results in additional agency costs, and this can lower dividend distributions. Ferris et al. (2003) illustrate that busy directors result from multiple directorships, which may result in negative socio-cognitive effects from their colleagues in different BODs, and that lessens the expected effective monitoring rule. However, Fama and Jensen (1983) suggest that multiple directorships can reflect a good quality of the director. Participating in multiple BODs is an outcome of their success in the firm for which they work. In line with this view, Ferris et al. (2003) illustrate that this is called reputation effect, and they provide supporting results for this view. Accordingly, Sharma (2011) argues that enhancing monitoring and control can result in more conservative dividend payouts to mitigate agency costs. Moreover, Ferris et al. (2017b) indicate that social capital is strongly associated with reputation effect, which shows that socially connected directors try to protect their good reputation through effective implementations of their rules. Their work results are consistent with reputation effect (Ferris et al., 2003; Fama and Jensen, 1983).

As noted earlier, non-financial aspects have monetary influences on firms' dividend payments. For instance, Shao et al. (2010) provide evidence of the influence of management's and investors' perceptions as a determinant of dividend policy. They used Schwartz's national culture measurements, conservatism and mastery, and found that conservatism had a positive influence on dividend payouts. This relationship is interpreted as a signal of managers' discipline and a signal of security needs, whereas mastery has a negative influence on dividends, which gives insiders a better chance to take control of a firm's resources. These findings suggest that the cultural aspect affects the perceptions of managers and investors, which, in turn, influences the information asymmetry and agency problem.

In addition, cultural differences have been studied as a determinant of payout policy. For instance, based on data from 33 countries, Bae et al. (2012) found that the cultural aspects of uncertainty avoidance, masculinity and long-term orientation, derived from Hofstede's cultural dimensions, were key determinants of a firm's dividend policy. Moreover, they show that it is difficult to ignore the influence of culture in any aspect of human life, reporting that the propensity to pay dividends and the level of dividends paid are affected by the cultural dimension.

Fidrmuc and Jacob (2010) linked dividend payout to cultural differences across 41 countries, also using Hofstede's cultural dimensions, and reveal that cultural factors, including individualism, power distance and uncertainty avoidance, have a significant association with dividend payout. Moreover, they show that dividend policy is influenced by social institutions, as measured by regulatory bodies and culture. Ucar (2016) investigated the effects of cultural and religious differences on dividend policy. He found that firms located in Protestant areas had a higher tendency to pay and initiate dividends and a higher ratio of dividend to price. On the other hand, firms located in areas with a Catholic population had a lower tendency to distribute cash dividends and a lower ratio of dividends to price. Accordingly, he asserts that when local investors are the dominant investors in a certain firm, their corporate policies will work in line with the local culture. In China, Cao et al. (2016) explored how religiosity can shape dividend policy by examining the relation between Buddhism/Taoism and dividend payout decisions. They found that regions with a strong Buddhist or Taoist influence tended to pay higher dividends, as the faiths involve more sympathy, sharing behaviour and compassion, thus having a significant influence on dividend policy through the distribution of profits rather than their accumulation. In light of the bird-in-hand argument, Chintrakarn et al. (2019) argue that religiosity is associated with a higher degree of risk aversion. They also report that piety is associated with a stronger tendency to pay dividends.

In a related study, Davaadorj (2019) introduced the influence of regional social capital on firms' dividend policy, considering the direct influence through behaviour, and indirectly by reducing opportunity cost. He found that the BOD better caters for investors' preferences for bird-in-the-hand in social capital areas. Moreover, he found that social capital helps to reduce the cost of capital, which motivates the BOD not to hold cash, and, as a result, dividend payments increase. He also reports that the positive influence of social capital on dividends is stronger for firms with poor governance.

Previous studies have also used Hofstede's cultural dimensions and Schwartz's national culture dimensions; for example, Schwartz (1994) and Rupasingha et al. (2006) used the social capital index to explain dividend policy. However, these studies were limited to cross-country research, the US, and some in China. The results may not effectively explain the dividend policy of UK firms due to regulation and cultural differences, as the structure of social capital is different in the UK to that in other countries (Renneboog and Zhao, 2013). For instance, the 2006 UK Companies Act asserts that profitable companies are not required to distribute

dividends, leaving dividend policy as a voluntary decision. This is clear in Section 830 of the act, which states the two primary conditions under which a firm may pay dividends:

> A company may only make a distribution out of profits available for the purpose of paying dividends; and
> A company's profits available for distribution are its accumulated, realised profits, so far as not previously utilised by distribution or capitalisation, less its accumulated, realised losses, so far as not previously written off in a reduction or reorganisation of capital duly made.[7]

Nevertheless, these regulations add to the complexity of the dividend policy dilemma in the UK business environment when firms are attempting to develop their dividend policy. Accordingly, dividend decisions needs more more explanations in the UK market, since in 2010, the UK CGC focused on the relationships between BOD members in general, and specifically those in the FTSE 350 Index. [8]

As noted earlier, previous studies illustrate that the socio-economic perspective is worthy of consideration in corporate finance. Chu and Davis (2016) state that highly connected networks of directors become an inner circle, serving as an efficient mechanism for diffusing information and corporate practices and encouraging elite cohesion. For this reason, understanding the social capital concept by means of director interlocking is relevant to corporate finance decisions; for example, Chu and Davis (2016, p.717) note: 'What is at stake is how we understand the social structure of corporate control'.

Social capital has received growing attention in corporate finance because of its ability to facilitate information sharing, build trust, and enhance monitoring and control. In the information sharing approach, social capital provides an efficient way of sharing information, which would not be possible (or hard to achieve) otherwise (Shropshire, 2010). For instance, Cohen et al. (2008) highlight that educational networks facilitate information exchange between mutual fund managers and firm BODs. In the same vein, Cai and Sevilir (2012) illustrate that social connections between acquired and target firms mitigate information

[7] Companies Act 2006, accessed via https://www.legislation.gov.uk/ukpga/2006/46/section/830/2015-05-25?view=plain. Accessed on 2 June 2021.
[8] For example, sections B.1.1 and B.1.2 of the UK CGC (2010) state that in all FTSE 350 companies, 50% of the board should be independent non-executive directors. The independence of directors is defined differently across countries depending on the origin of the legal system (Zattoni and Cuomo, 2010).

asymmetry. Consequently, it is expected that MSC will facilitate information flow, which should smooth information asymmetry and reduce the need to signal to the market. Equally important, Ferris et al. (2017b) and Gupta et al. (2018) argue that social capital is a strong mechanism which alleviates opportunistic managerial behaviour through its reputation effect. Furthermore, this study conjectures that the need to build a good reputation in the market through dividends is not necessary, as it is already achieved through social connections. Accordingly, this study adds to the theoretical framework of previous studies by adding the combination of dividends policy and reputation effect (Hirshleifer, 1993), and it expects that social capital will reduce managerial incentives to distribute dividends.

Keeping this in mind, social capital is defined in many different ways; for example, as a means for networks to accelerate the efficiency of collective actions (Putnam et al., 1994) through the embedded features in social networks, such as information transfer, trust, and norms (Woolcock, 1998). Moreover, social capital has received considerable attention from resource dependence theory (RDT) (Hillman and Dalziel, 2003; Pfeffer, 1987; Pfeffer and Salancik, 1978). This model suggests that a firm can meet environmental uncertainty and a scarcity of resources such as trust by maintaining good connections with other firms. Previous research (e.g.,Shropshire, 2010; Davis, 1991; Grossman and Hart, 1986) shows that BOD linkages eliminate extra costs related to incomplete contracts, allow the learning of new tactics, and facilitate access to information.

Moreover, social capital is a means of supporting trust among networked participants, which facilitates efficient and effective transactions, implying that it is an efficient medium for inducing cooperative links. Therefore, trust is vitally important in financial market transactions and social connections, as it helps to support efficient transactions among participants (Arrow, 1972). Moreover, social capital stimulates managerial concern regarding their reputation and future career plans. Therefore, honest dealing becomes dominant among socially connected agents (McMillan and Woodruff, 2000), leading to a reduction in agency costs.

To emphasise this, coupled with reputation effects, previous studies assert that dividend payments can be affected by monitoring and control; this is evident in the literature that studies the relationship between corporate governance and dividend policy (Chen et al., 2017b; Sharma, 2011; Chae et al., 2009). However, as discussed by Chae et al. (2009), the agency problem and dividend payments decision has not been explained explicitly in corporate finance literature, particularly under the effect of financing constraints, which can be released through

social connections (García-Feijóo et al., 2021). In this regard, La Porta et al. (2000) and Jiraporn et al. (2011) explain dividend policy under the agency model through two hypotheses, the substitution hypothesis and the outcome hypothesis. However, these studies do not clearly provide an empirical examination of the role of social capital and dividend payout.

2.2.2 Substitute hypothesis[9]

This paper investigates how MSC is associated with dividend payouts. Accordingly, the study illustrates that MSC has certain attributes which lead to better monitoring policy, and this, in turn, results in lower agency costs. However, the exact explanation for this reduction in agency costs is not theoretically clear. Therefore, building on the argument of La Porta et al. (2000), this study builds on the substitute hypothesis to explain this relationship.

Indeed, dividend policy is one of the tools that can be considered to mitigate the conflict between managers and shareholders. However, the usefulness of this policy in alleviating agency costs depends on the degree of control of management decisions. Therefore, managers with poor monitoring can deviate from the efficient use of free cash flow to invest in inefficient projects. In this vein, Jiraporn et al. (2011) argue that the market responds negatively to dividend cuts and unstable dividend policy, so dividend policy works as a pre-commitment mechanism that forces managers to work in the best interest of shareholders; the mechanism works effectively in the presence of a severe agency conflict.

However, as argued by La Porta et al. (2000), the substitution hypothesis is based on the premise that sometimes firms need to raise money from external capital markets. Therefore, they try to establish a good reputation in the market due to their commitment to shareholders and not to exploit them, to be able to obtain capital from the market on suitable terms. Therefore, one of the tools to achieve this target is the use of dividend payments to prove the commitment of management to shareholders. This is due to the fact that dividend payments reduce the available cash in the hands of the management, thus alleviating any expected opportunistic behaviour by them. Consequently, firms with a weak governance regime need to

[9] This study builds on the substitute hypothesis. However, the outcome hypothesis is not used in this study. To illustrate this, the outcome hypothesis is rooted in the free cash flow hypothesis (Jensen, 1986). In this regard, firms with weak governance will allow managers to keep cash within the firm, as this enables them to use it for their own interests to help in building their empire, and to invest in projects that maximise their own benefits and prestige but which could deviate from the shareholders' best interests. On the other hand, firms that have strong governance can prohibit managers from using free cash flow for their own agendas. Therefore, they will tend to pay out cash dividends to shareholders. Accordingly, it is expected that firms' dividend policy is the outcome of governance quality. Consequently, the outcome hypothesis posits that firms with a strong governance regime pay higher dividends to shareholders, a hypothesis that is supported by La Porta et al. (2000).

build a good reputation in the market, which is possible by paying dividends. This study argues that in addition to its ability to release financial constraints, MSC equips company directors with a good reputation, monitoring, and prestige. Therefore, firms with such directors can use their connections in the market to access cash, implying that well-connected directors can offset (substitute) the need for distributing extra dividends. In simple terms, larger dividends are a substitute for a stronger monitoring system; the need for dividends has to be greater for companies with a poor governance regime than for those with a solid one, indicating that the relationship between dividend policy and MSC can be negative.

Social capital fosters monitoring and control by obtaining information at lower costs and completing contracts at low cost, and it provides the capability to punish and reward, which is very sensitive to cash flow (Hasan et al., 2020; Javakhadze et al., 2016b). In relevant research studies, Ferris et al. (2017b) and Gupta et al. (2018) report that social capital impacts cost of equity by alleviating asymmetric information and agency costs. In addition, social connections increase executives' prestige and reputation (Useem, 1984). Certo (2003) found that based on signalling theory, prestigious directors are used by firms to inform the market about their prestige and legitimacy, which influences investors' decisions on the purchase of shares. Therefore, monitoring and control functions, which are a vital job of BODs, should improve since well-connected BODs have better MSC.

Therefore, this study builds on the fact that a strong monitoring mechanism, a reduced form of asymmetric information problem, better information transfer, less need for signalling the market, and the reputation effect will result in less need to pay dividends. This is consistent with corporate governance literature, which asserts that a strong governance system results in less need to pay dividends. Moreover, these expectations are reasonable, as this research argues that social capital attributes have common influences on dividends policy like the corporate governance regimes. Under those circumstances, this study postulates that social capital can negatively impact dividend policy, which is in line with the corporate governance literature (Jiraporn and Lee, 2017; La Porta et al., 2000). In a relevant research study, Al-Najjar and Belghitar (2014) emphasise that studying the effect of MSC on dividend decisions can improve the knowledge and understanding of the role of monitoring in cash dividend decisions. Therefore, this study adds to the extant literature by using the substitution model and signalling theory to investigate the relationship between social capital and dividend policy.

Accordingly, consistent with the substitution model and signalling theory of dividends, it is postulated that:

H_1: There is a negative relationship between board social networks and dividend payout policy.

Interestingly, Mizruchi (1996) illustrates that financial firms are crucial in studying the effect of social networks. Indeed, his argument is in line with the fact that financial firms have several representatives in different firms and from different firms, which is supported by (Javakhadze et al., 2016b). Additionally, Akbar et al. (2017) show that corporate governance characteristics vary in their effect on the performance of financial firms. However, Pathan (2009) explains that non-financial firms work in a less risky environment than financial firms, which may result in a conservative policy to distribute dividends. Indeed, financial firms were explicitly excluded in several works, such as in corporate governance, dividend distributions and, more recently, social capital studies (García-Feijóo et al., 2021; Jiraporn and Lee, 2017; Ucar, 2016). Moreover, the regulations in the financial sector are very rigid (Laeven and Levine, 2009). Under these conditions, this study goes beyond previous studies and does not ignore the differences in the financial sector. It classifies firms as financial and non-financial to provide a deep understanding of the association between dividend policy and social capital. Accordingly, this study adds to the extant literature by estimating all firms in a pooled sample in one model, thereafter, separating the sampled firms into financial and non-financial firms.

H_2: The expected association between MSC and dividend policy is not subject to change under the financial and non-financial firms.

2.3 Sample, model, and variables construction

2.3.1 Sample and data

This study uses data from the UK to investigate the relationship between dividend policy and MSC. Accordingly, it obtained data from the FTSE 350 Index of firms for the period 2006–2017. The data encompass all firms that were included in the index at some point during the study period; in this way, the study data avoid any probability of survivorship bias. The study period covers some of the main developments that have taken place regarding governance rules in the UK. For example, the CGC of 2010 asserts that in the case of all FTSE 350 companies, 50% of the board should be independent non-executive directors, which has a major effect on BOD social capital (Devos et al., 2009).

To test the study hypotheses, data were sourced from the BoardEx[10] database to construct the social capital variable through the social networking approach, that is, using degree centrality, in addition to extracting governance variables. The BoardEx data were then matched with DataStream/Worldscope for financial and accounting variables by using the corporate International Securities Identification Number code.[11] Consequently, to reduce the effect of outliers, all continuous variables were winsorised at the 1st and 99th percentiles (e.g., Javakhadze et al., 2016b). Previous studies on MSC, such as that of Oyotode-Adebile and Ujah (2021), excluded financial and utility firms, whereas Mizruchi (1996) and Javakhadze et al. (2016b) assert that the connections with/through financial firms are an essential determinant of MSC.

In addition, the FTSE 350 Index firms, which are used in this study, include financial and non-financial firms. Consequently, to test the first hypothesis (H_1: *There is a negative relationship between board social networks and dividend payout policy*), and thereafter to test the second hypothesis (H_2: *The expected association between the MSC and dividend policy is not subject to change under the financial and non-financial firms)*, this study uses all firms, non-financial firms, and financial firms in a separate estimation to compare the three situations and provide empirical evidence on hypotheses H_1 and H_2. Therefore, the sample of the study not only includes all firms on the FTSE 350 Index, but also the sample is divided into financial and non-financial firms in separate estimations. However, the final study sample consists of an unbalanced panel of 3,638 firm-year observations.[12]

2.3.2 Study model

Following extant literature, this study uses two models,[13] the logit model (Chen et al., 2017b; Sharma, 2011) and the tobit model (Chen et al., 2017b; Sonika et al., 2014), to test the study hypotheses as follows:

Model-I: Logit estimation

$$DIVDUM_{i,t} = \beta_0 + \beta_1(MSC) + \beta_2(NED_{i,t-1}) + \beta_3(BSIZE_{i,t-1}) + \beta_4(ASIZE_{i,t-1}) + \beta_5(GEN_{i,t-1}) + \beta_6(ROA_{i,t-1}) + \beta_7(VOL_{i,t-1}) + \beta_8(DEBTR_{i,t-1}) + \beta_9(FSIZE_{i,t-1}) + \beta_{10}(TOBIN'Q_{i,t-1}) + \beta_{11}(TURN_{i,t-1}) + \beta_{12}(FAGE_{i,t-1}) + INDD + YEARD + \varepsilon_{i,t} \quad \textbf{(1)}$$

[10] The BoardEx database started data collection in 1999, then updated its collection methodology in 2006 (Larcker et al., 2013).
[11] Some missing data were collected from FAME, Bloomberg, annual reports, and https://www.gov.uk/.
[12] More details on the sample are provided in section 2.5.1, Table 2.7.
[13] These models are used to estimate the sampled firms as financial firms, non-financial firms, and all firms.

Model-II: Tobit estimation

$$DIVPOUT_{i,t} = \beta_0 + \beta_1(MSC) + \beta_2(NED_{i,t-1}) + \beta_3(BSIZE_{i,t-1}) + \beta_4(ASIZE_{i,t-1}) + \beta_5(GEN_{i,t-1}) + \beta_6(ROA_{i,t-1}) + \beta_7(VOL_{i,t-1}) + \beta_8(DEBTR_{i,t-1}) + \beta_9(FSIZE_{i,t-1}) + \beta_{10}(TOBIN'Q_{i,t-1}) + \beta_{11}(TURN_{i,t-1}) + \beta_{12}(FAGE_{i,t-1}) + INDD + YEARD + \varepsilon_{i,t} \quad (2)$$

2.3.3 Dependent variables

To predict the firm's dividend policy, this study considers two estimation methods: the logit estimation model, and the tobit model. These two econometric techniques are designed to capture the nature of dividend decisions. In fact, firms need to make two decisions regarding dividend distributions: they can decide not to pay any dividend, or they can distribute up to 100% of their earnings. This means that in either scenario, dividends are never negative. Accordingly, there are two scenarios for dividends policy. The first scenario is paying dividends or not; in this scenario, the dependent variable, DIVDUM, is a binary variable (0/1), which is estimated using logit regression (Wooldridge, 2015). The second scenario is the ratio of dividend distributions; in this scenario, the dependent variable, DIVPOUT, is left-censored at zero, and then tobit regression is the appropriate model, as it has continuous and discrete values (Wooldridge, 2015; Greene, 2003).

2.3.4 Main independent variable

Generally, social capital is classified into three dimensions: the structural dimension (Bourdieu, 1989), the relational dimension (Nahapiet and Ghoshal, 1998), and the cognitive dimension (Coleman, 1988). The latter two may look similar, and sometimes they are categorised as a macro concept of social capital. The cognitive dimension pays more attention to the common values and goals of actors, whereas the relational dimension focuses more on the trust between connected actors (Nahapiet and Ghoshal, 1998). More importantly, the structural dimension relates social capital to the connections among actors in social networks and is related to structural theory (Lin, 1999; Burt, 1992). Consequently, social capital in this theory is an embedded asset residing in the social network between agents, which can be used to facilitate and transfer these assets. This means that one can use the size of social networks to determine the value of social capital for the network participants (Javakhadze et al., 2016b; Burt, 1983; Freeman, 1979).

The literature on corporate finance uses the structural dimension of social capital, which is commonly referred to as social network capital. It has a significant influence on different

corporate finance applications. For instance, Fogel et al. (2018) report that the terms of private debt are influenced by social capital through implementation of structural social capital methods. Similarly, Engelberg et al. (2012) state that interest rates will be reduced if banks are connected through management ties, a process which also implements structural social capital methods. Such an influence stems from the exchange of information, trust and norms that implicitly reside in social networks (García-Feijóo et al., 2021; Hasan et al., 2020). Therefore, in this study, the structural social capital view is considered. Accordingly, MSC is calculated as the size of the social network held by an agent on the board team from the social networking index, as developed by Fracassi (2017) and explained below.

The first dimension is 'network through current employment', in which case two agents are connected by working together in the same firm. The second dimension is 'network through past employment', that is, two individuals are connected through a previous employment network if they worked together in the same firm at the same time as board members or in the management team. Third, two individuals can be connected through the educational network if they attended the same university and graduated within one year of each other. Finally, there can be a 'network through other activities'. In this case, this study considers the connections between two individuals if they have membership of the same clubs, charities, or other organisations at the same time. The overall connections are aggregated to represent the firm-level connections as the managerial social capital index (MSCI) in the models for each year from 2006 to 2017. This approach is consistent with that adopted in recent studies in corporate finance (e.g.,Javakhadze and Rajkovic, 2018; Ferris et al., 2017b; Javakhadze et al., 2016b). All the information/data to develop the firm-year MSCI were extracted from the BoardEx database.

2.3.5 Control variables

Previous studies provide numerous variables that influence firms' dividend policy. Generally, these variables are categorised into two broad groups; the first is related to governance characteristics, and the second to firm-specific characteristics. Previous studies investigating corporate governance variables and dividend policy reveal that, consistent with the substitution hypothesis, cash dividend is a substitute for independent directors on the board (Al-Najjar and Hussainey, 2009). Board independence ($NED_{i,t-1}$) has been measured as the lagged percentage of independent directors to board size (Akbar et al., 2017). This study also includes board size, which has a negative influence on payout decisions (Ghosh and Sirmans, 2006). Board size ($BZISE_{i,t-1}$) is measured as the natural logarithm of the lagged number of directors on the board

(Akbar et al., 2017). In addition, female presence ($GEN_{i,t-1}$) on the board is quantified as the percentage of female directors on the board (Chen et al., 2017b). Another governance mechanism that has an influence on dividend policy is audit committee size ($ASIZE_{i,t-1}$) (Elmagrhi et al., 2017).

Similarly, firm-specific characteristics are included to account for the financial variables. One of the relevant variables that determines a firm's ability to generate profit is its profitability (Aivazian et al., 2003). Therefore, firm profitability ($ROA_{i,t-1}$) has been included as lagged net income to total assets (Homroy and Slechten, 2019). Moreover, firms' dividend policy is significantly affected by the uncertainty of stock returns. Consequently, the risk measure is a key determinant of dividends (Baskin, 1989). Therefore, the volatility of returns ($VOL_{i,t-1}$) has been considered using the standard deviation of daily returns each year (Chung and Chuwonganant, 2018). Another consideration related to a firm's dividend policy is its ability to pay its obligations (Jensen et al., 1992), and therefore the debt ratio ($DEBTR_{i,t-1}$) is used, measured as total debt to market capitalisation.

In addition, since larger firms have better access to external cash, this implies that they tend to pay more dividends (Farinha, 2003). Firm size ($FSIZE_{i,t-1}$) has been used, measured as the natural logarithm of the total assets of the sample firms (Jiraporn et al., 2009). Moreover, better performance by firms leads to greater dividends (Florackis et al., 2015). Therefore, Tobin's Q ($Q_{i,t-1}$) is employed, measured as the number of shares outstanding times the stock price, plus total liabilities to total assets (Singh et al., 2018), to proxy for a firm's superior performance. Bearing this in mind, the quality of asset utilisation produces higher profits and, in turn, more probability of distributing dividends, so the sales to assets ratio ($TURN_{i,t-1}$) has also been used in the estimation of the study models (Singh and Davidson III, 2003). Another factor is related to the maturity of the firm; older, more stable, firms tend to distribute more dividends (Grullon et al., 2002). Accordingly, this study uses firm age ($FAGE_{i,t-1}$) as a determinant of dividend policy. Industry and year dummies are also included in both models to account for variations in industries and over time. Full details of the study variables are given in Table 2.1.

2.4 Empirical findings

Table 2.2 presents the descriptive statistics of all the variables discussed in Section 2.3 and Table 2.1. These variables are employed in multivariate analyses in the study. The panel dataset merged 376 firms that appear at least once on the FTSE 350 Index during the period 2006–2017 to minimise survivorship bias.

As shown in Table 2.2, the average PAYOUT is 36.4%, with a 26.9% standard deviation, which means that less than 50% of the generated income is distributed as dividends. DIVDUM has a mean value of 84%, showing that 84% of the sample firms paid a dividend at some point during the sample period. MSC is the main independent variable in the study, with a minimum value of zero, a maximum value of 11.79, and a mean value of around 5. This result is similar to that of the study conducted by Homroy and Slechten (2019), who found that the average connection between board teams on the FTSE 350 was around 4.

Regarding the governance variables, NED has a mean of 62%, which means that independent directors are dominant on the firms' BODs. In addition, BSIZE has an approximate average of 2 (measured as a natural logarithm, $e^2 = 8$), although ASIZE is 1.4 (also measured as a natural logarithm, $e^{1.4} = 4.05$), a value that is consistent with the finding of (Al-Najjar, 2011). In addition, the GEN variable has a mean of 12.8%, with a minimum value of zero, which means that for some firm-years, there are no women on the BOD.

In addition, the use of debt is common in the UK, with DEBTR having a mean value of 144%. Moreover, ROA shows that only around 6% of returns are derived from assets. The risk measured by VOL has a mean value of 32.9% and a standard deviation of 17.2%. Furthermore, asset utilisation has a mean value of 81.8%. Table 2.3 shows the descriptive statistics of the remaining variables.

Table 2.3 displays the results of the correlation matrix across the study variables and the variance inflation factors (VIFs) for the independent variables. Gujarati (2003) illustrates that collinearity between two of the independent variables may result in an econometric problem known as multicollinearity. Accordingly, having a VIF value equal to or above 10 implies that the tolerance (1/VIF) value is lower than 0.10, which indicates that there is a multicollinearity problem. The highest value of the VIF is 1.91, with a tolerance of 0.53. Therefore, the multicollinearity problem has no influence on the results of this study.

A set of statistical treatments are considered to deal with the panel data. First, all the continuous variables were winsorised at (below) 1% and (above) 99% to mitigate the effect of the outliers (e.g.,Javakhadze et al., 2016b). Moreover, the endogeneity issue could lead to inconsistent results. Therefore, following Wintoki et al. (2012), this study assumes that all the governance and financial variables are endogenous apart from the age and year dummies, so the one-year lag of these endogenous variables is included. In addition, the study adds industry and time

Table 2.1. Variables: definitions and sources				
Variable	Notation	Source	Variable description	Previous studies/Code(s)
Dependent variable				
Dividend payout ratio	PAYOUT	DataStream	Dividends per share divided by earnings per share*100	Sonika et al. (2014)/WC09504
Dividend pay	DIVDUM	DataStream	Binary variable equal to one if the firm pays dividends, and 0 otherwise	Sharma (2011)
Independent variables				
Managerial social capital	MSC	BoardEx	Firm aggregate connections for each board member (plus one)	Fracassi and Tate (2012); own calculation; Ferris et al. (2017b)
Board independence	NED	BoardEx	Ratio of the number of independent directors to the number of all directors *(one-year lagged and winsorised)*	(Akbar et al., 2017)
Board size	BSIZE	BoardEx	Total number of directors sitting on the board (*one-year lagged)*	Fracassi (2017)
Audit committee size	ASIZE	BoardEx	Total number of directors sitting on the audit committee *(one-year lagged)*	Elmagrhi et al. (2017)
Female directors	GEN	BoardEx	Ratio of the number of female directors to the total number of directors *(one-year lagged and winsorised)*	Chen et al. (2017b)
Return on assets	ROA	DataStream	Ratio of net income to total assets *(one-year lagged and winsorised)*	Homroy and Slechten (2019)/WC01751; WC02999
Volatility	VOL	Bloomberg	Return volatility of each stock using the standard deviation of daily returns each year *(one-year lagged and winsorised)*	Chung and Chuwonganant (2018); own calculation
Debt ratio	DEBTR	DataStream	Short-term and long-term debt divided by market capitalisation *(one-year lagged and winsorised)*	Ferris et al. (2018)/WC03251; WC03051; P; NOSH
Firm size	FSIZE	DataStream	Ln (total assets) *(one-year lagged)*	Huang and Shang (2019)/WC02999
Tobin's Q ratio	Q	DataStream	Number of shares outstanding times stock price, plus total liabilities divided by total assets *(one-year lagged and winsorised)*	Singh et al. (2018)/NOSH; P; WC03251; WC03051; WC02999
Turnover ratio	TURN	DataStream	Asset turnover, measured as the ratio of annual sales to total assets *(one-year lagged and winsorised)*	Singh and Davidson III (2003)/WC01001; WC02999
Firm age	FAGE	DataStream/ gov.uk	Natural logarithm of the number of years since the incorporation of the firm *(one-year lagged and winsorised)*	Akbar et al. (2017); WC18273
Industry dummy	SIC	Bloomberg	Dummy for each micro-sector	Phillips and Ormsby (2016)
Year dummy	YEAR		Dummy variable for each year	

Table 2.2. Summary statistics and descriptive statistics of the study variables used in the multivariate analyses in the study. The dataset includes 3,638 firm-year observations of FTSE 350 firms during the period 2006–2018.

		N	*Max*	*Min*	*Mean*	*25%*	*Median*	*75%*	*SD*	*Skewness*	*Kurtosis*
1	PAYOUT	3293	0.98	0.000	0.364	0.122	0.363	0.548	0.269	0.310	2.229
2	DIVDUM	3636	1.000	0.000	0.844	1.000	1.000	1.000	0.363	-1.897	4.597
3	MSC	3638	11.79	0.000	5.041	3.951	5.286	6.526	2.202	-0.632	3.434
4	NED	3618	0.857	0.250	0.623	0.556	0.625	0.714	0.128	-0.495	3.032
5	BSIZE	3618	3.332	1.099	2.092	1.946	2.079	2.303	0.289	0.264	3.196
6	ASIZE	3432	2.565	0.000	1.401	1.099	1.386	1.609	0.341	-0.747	5.626
7	GEN	3383	0.50	0.000	0.128	0.000	0.13	0.20	0.12	0.697	2.992
8	ROA	3638	0.303	-0.320	0.066	0.025	0.056	0.103	0.083	-0.625	8.003
9	VOL	3638	1.05	0.000	0.329	0.22	0.295	0.40	0.172	1.386	6.254
10	DEBTR	3637	28.329	0.003	1.436	0.19	0.491	1.077	3.781	5.548	35.993
11	FSIZE	3638	22.266	9.329	14.095	12.846	13.799	15.045	1.829	1.049	4.712
12	Q	3638	5.319	0.616	1.53	0.966	1.232	1.791	0.864	2.133	8.234
13	TURN	3638	3.413	0.000	0.817	0.119	0.638	1.194	0.785	1.178	4.019
14	FAGE	3623	4.97	0.000	3.565	2.944	3.466	4.344	0.803	-0.157	2.447

dummies to deal with any unobservable fixed-effects characteristics that may derive from the effect of MSC on dividend policy.

Table 2.3. Pearson's correlations and VIF values

Variable	MSC	BSIZE	NED	ASIZE	GEN	ROA	VOLA	DEBT	FSIZE	Q	TURN	VIF	1/VIF
MSC	1											1.277	0.783
BSIZE	0.108*	1										1.199	0.834
NED	−0.09*	-0.080*	1									1.906	0.525
ASIZE	-0.042*	0.015	0.097*	1								1.606	0.623
GEN	**-0.18***	0.032	0.123*	**0.258***	1							1.657	0.603
ROA	-0.076*	0.006	0.02	0.058*	0.039*	1						1.433	0.698
VOL	0.074*	0.016	-0.042*	-0.111*	**-0.18***	-0.100*	1					1.288	0.776
DEBT	0.075*	0.205*	0.028	-0.052*	-0.029	-0.243*	**0.087***	1				1.109	0.902
FSIZE	0.107*	**0.514***	**0.218***	-0.057*	0.061*	-0.06*	0.037*	**0.494***	1			1.146	0.873
Q	-0.018	-0.02	-0.031	0.044*	0.046*	**0.269***	-0.061*	-0.163*	-0.108*	1		1.209	0.827
TURN	0.054*	-0.156*	-0.025	-0.023	-0.057*	0.038*	0.054*	-0.114*	**-0.183***	**0.372***	1	1.165	0.858
FAGE	-0.018	-0.026	0.026	0.048*	0.076*	0.037*	-0.045*	-0.053*	0.051*	-0.098*	0.013	1.341	0.746

**Indicates significance level at 5%*

2.4.1 Multivariate analysis

This section presents an empirical test for the study hypotheses. However, as this study has discussed, the financial firms play a significant role in building social connections, the MSC variable, the primary outcomes of this study will be based on all the sample firms.[14] Nevertheless, this study does not ignore the expected differences that might result from separating the sample into financial and non-financial firms. Therefore, in addition to examining the hypothesis H_1, this chapter provides a further test for the hypothesis H_2 to provide better insights into the relationship between dividend policy and social capital. Additionally, this section presents the outcomes under the logit model and the tobit model based on the econometric nature of each dependant variable.

Logit estimations

In Table 2.4, Model-I, Model-II and Model-III report the estimations for the logit regressions using all the sample firms, non-financial firms, and financial firms, respectively. As illustrated, logit regression is used to consider the decision of paying dividends or not (e.g., Sharma, 2011; Al-Najjar and Hussainey, 2009). The logit regressions in each model (Model-I, Model-II, Model-III) show that MSC has a negative influence on the probability of paying dividends. To illustrate this, as reported in the coefficient in Model-I, $t = -3.364$, $p < 0.01$ for the whole sample of firms, for Model-II, $t = -1.994$, $p < 0.05$ for non-financial firms, and for Model-III, $t = -1.782$, $p < 0.10$ for financial firms. This result indicates that the higher the MSC, the lower the probability of paying dividends. Equally important, as shown by the estimations' outcome in the three logit models, the relationship between MSC and dividend distributions is the most significant at 1% in Model-I followed by Model-II, which is significant at 5%, and finally, Model-III, at the 10% significance level. Accordingly, the whole sample of firms results in the strongest relationship, followed by the non-financial firms and finally, the financial firms. Keeping this in mind, for Model-I, the marginal effects of MSC, all else being equal, show that a 100% point increase in MSC will decrease the probability of distributing dividends (DIVDUM) by approximately 1% for average firms, which is close to the marginal effects in Model-II and Model-III.

[14] For logit estimation, the firms in the whole sample are provided in Table 2.4 through Model-I, whereas the outcomes for firms in the whole sample under the tobit model are provided in Table 2 through Model-IV.

Table 2.4. The effect of the MSC on dividend policy.
This table reports the logit estimations and z-statistics in the parentheses. *** p < 0.01, ** p < 0.05, * p < 0.10 indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Independent variables are one-year lagged, industry and year fixed effects already used. Variables' description is available in Table 2.1. Model-I, Model-II, and Model-III represent the whole sample of firms, non-financial sample firms, and financial sample firms, respectively.

	Model-I		Model-II		Model-III	
	Whole sample		Non-financial		Financial	
Model	Pooled Logit	Marginal effect	Pooled logit	Marginal effect	Pooled logit	Marginal effect
MSC	-0.115***	-0.011***	-0.083**	-0.008**	-0.104*	-0.010*
	(-3.364)	(-3.367)	(-1.994)	(-1.998)	(-1.782)	(-1.784)
BSIZE	-0.635**	-0.061**	-0.02	0.002	-1.283***	-0.121***
	(-2.363)	(-2.365)	(-0.0517)	(-0.0517)	(-2.863)	(-2.846)
NED	-2.348***	-0.224***	-2.264***	-0.215***	-2.574***	-0.242***
	(-3.986)	(-4.01)	(-3.176)	(-3.193)	(-2.617)	(-2.603)
ASIZE	-0.22	-0.02	0.06	0.01	-0.631*	-0.0593*
	(-1.15)	(-1.152)	(0.24)	(0.24)	(-1.891)	(-1.91)
GEN	-1.692***	-0.162***	-1.09	-0.1	-1.810	-0.17
	(-2.656)	(-2.651)	(-1.311)	(-1.306)	(-1.578)	(-1.591)
ROA	13.45***	1.284***	17.980***	1.705***	10.71***	1.006***
	(8.56)	(9.82)	(6.63)	(7.81)	(5.820)	(6.86)
VOL	-1.558***	-0.149***	-2.155***	-0.204***	-0.660	-0.06
	(-3.583)	(-3.588)	(-4.434)	(-4.414)	(-0.878)	(-0.878)
DEBTR	-0.105***	-0.01***	-0.087***	-0.008***	-0.05	-0.01
	(-5.261)	(-5.19)	(-4.425)	(-4.312)	(-1.109)	(-1.103)
FSIZE	0.539***	0.052***	0.408***	0.039***	0.586***	0.055***
	(9.44)	(9.29)	(6.49)	(6.30)	(6.04)	(6.04)
TOBIN'Q	-0.03	0.003	-0.381***	-0.036***	0.823***	0.077***
	(-0.333)	(-0.334)	(-3.037)	(-3.161)	(3.70)	(3.79)
TURN	0.485***	0.046***	0.555***	0.0526***	0.030	0.003
	(5.55)	(5.46)	(4.91)	(4.74)	(0.19)	(0.19)
FAGE	0.457***	0.0437***	0.39***	0.0369***	0.45***	0.0423***
	(5.94)	(5.82)	(4.19)	(4.05)	(3.47)	(3.44)
Constant	-1.26		-2.528**		-3.000**	
	(-1.128)		(-2.472)		(-2.007)	
Observations	2797	2797	1813	1813	995	995
Pseudo R2	0.27		0.27		0.26	
Wald chi2	427.18***		237.10***		144.44***	

Tobit estimations

In Table 2.5, Model-IV, Model-V, and Model-VI present the estimations for the tobit regressions using the whole sample of firms, non-financial firms, and financial firms, respectively. As illustrated, tobit regression is used to consider the fact that the dividend payout ratio is left-censored at zero and comprises discrete and continuous observations (Jiraporn et al., 2011; Al-Najjar and Hussainey, 2009).

The tobit regressions in Model-IV, Model-V and Model-VI show that MSC has a negative influence on the dividend payouts. To explain this, as reported in the coefficient in Model-IV,

t = −2.796, p < 0.01 for the whole sample of firms, in Model-V, t = 2.259 =, p < 0.05 for non-financial firms, and in Model-VI, t = −1.207, p > 0.10 for financial firms. This result indicates that the higher the MSC, the lower the payouts. Equally important, as shown by the estimations' outcome in the three tobit models, the relationship between MSC and dividend distributions is the most significant at 1% in Model-IV, followed by Model-V, which is significant at 5%, but Model-VI is not significant at 10%.

Accordingly, the whole sample of firms results in the strongest relationship, followed by the non-financial firms, yet it is not significant for the financial firms. Keeping this in mind, for Model-IV, the marginal effects of MSC, all else being equal, show that a 100% point increase in MSC will reduce the dividend distributions (PAYOUT) by approximately 0.70% for average firms, which is similar to the marginal effects in Model-II and Model-III.

Accordingly, it is obvious through logit and tobit estimations that MSC has a negative impact on the dividend policy, that is, for dividend decisions and dividend payouts. Overall, the result is consistent with the substitute hypothesis (La Porta et al., 2000). Consequently, this leads us to accept hypothesis H_1. To illustrate this, a good regime works as a substitute for paying dividends to shareholders. However, as explained earlier, the MSC held by the board members (management/directors) provides the firm with several advantages. This can improve monitoring and reduce agency costs and stimulate wealth-maximising policies, including the dividend policy. However, previous studies report a positive influence of social capital on the dividend policy and dividend smoothing (e.g.,García-Feijóo et al., 2021; Davaadorj, 2019; Fidrmuc and Jacob, 2010). That may result from the difference of CGC between the US and the UK, as the previous studies focus on the US data. Social capital is dynamic and is influenced by the nature of society (Hasan et al., 2020).

On the other hand, as presented in Table 2.4 (Model-II and Model-III) and Table 2.5 (Model-V and Model-VI), the estimation outcomes are still consistent with hypothesis H_1, in which the effect of MSC on dividend policy still has the same negative direction after separating the sample into financial and non-financial firms. Nevertheless, the negative relationship can be ranked according to the significance level as follows: the whole sample of firms provides the strongest relationship at 1%, followed by the non-financial sample at 5%, and finally, the financial sample at the 10% significance level in Model-VI, but not Model-VI.

Table 2.5. The effect of MSC on dividend policy. This table reports the tobit estimates and z-statistics in the parentheses. *** p < 0.01, ** p < 0.05, * p < 0.10 indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Independent variables are one-year lagged, industry and year fixed effects already used. Variables' description available in Table 2.2. Model-IV, Model-V, and Model-VI represent the whole sample of firms, non-financial sample firms, and financial sample firms, respectively.

	Model-IV		Model-V		Model-VI	
	Whole sample		Non-financial		Financial	
Model	Pooled Tobit	Marginal effect	Pooled tobit	Marginal effect	Pooled tobit	Marginal effect
MSC	-0.00701***	-0.00701***	-0.00638**	-0.00638**	-0.00576	-0.00576
	(-2.796)	(-2.796)	(-2.259)	(-2.259)	(-1.207)	(-1.207)
BSIZE	-0.0399*	-0.0399*	0.00664	0.00664	-0.102***	-0.102***
	(-1.832)	(-1.832)	(0.232)	(0.232)	(-2.918)	(-2.918)
NED	-0.133***	-0.133***	-0.0981*	-0.0981*	-0.204**	-0.204**
	(-2.793)	(-2.793)	(-1.677)	(-1.677)	(-2.521)	(-2.521)
ASIZE	-0.0104	-0.0104	-0.00628	-0.00628	-0.0259	-0.0259
	(-0.650)	(-0.650)	(-0.331)	(-0.331)	(-0.916)	(-0.916)
GEN	0.00853	0.00853	0.0945	0.0945	-0.142*	-0.142*
	(0.174)	(0.174)	(1.532)	(1.532)	(-1.687)	(-1.687)
ROA	0.255***	0.255***	0.507***	0.507***	0.0612	0.0612
	(4.154)	(4.154)	(6.400)	(6.400)	(0.599)	(0.599)
VOL	-0.0562	-0.0562	-0.0802	-0.0802	0.0254	0.0254
	(-1.268)	(-1.268)	(-1.559)	(-1.559)	(0.341)	(0.341)
DEBTR	-0.00943***	-0.00943***	-0.0104***	-0.0104***	-0.00427*	-0.00427*
	(-5.916)	(-5.916)	(-5.599)	(-5.599)	(-1.741)	(-1.741)
FSIZE	0.0436***	0.0436***	0.0363***	0.0363***	0.0467***	0.0467***
	(11.58)	(11.58)	(7.939)	(7.939)	(6.669)	(6.669)
TOBIN'Q	0.0277***	0.0277***	-0.00116	-0.00116	0.0626***	0.0626***
	(4.517)	(4.517)	(-0.167)	(-0.167)	(5.560)	(5.560)
TURN	0.0552***	0.0552***	0.0469***	0.0469***	0.0524***	0.0524***
	(8.002)	(8.002)	(5.571)	(5.571)	(4.169)	(4.169)
FAGE	0.00418	0.00418	0.00831	0.00831	-0.00247	-0.00247
	(0.676)	(0.676)	(1.110)	(1.110)	(-0.223)	(-0.223)
Constant	-0.0920		-0.111		-0.0408	
	(-1.258)		(-1.363)		(-0.372)	
Observations	2,541	2,541	1,631	1,631	910	910
Pseudo R^2	0.82		0.78		0.95	
F-Statistic	14.11***		13.54***		8.97***	

Accordingly, this leads to accepting the second hypothesis (H_2), which implies that the negative association between MSC and dividend policy is not subject to change if we separate the sample into financial and non-financial firms.

Importantly, this difference in the significance level lends additional support to the argument that calls for more attention to incorporating the financial firms in studying social networks as a measure of social capital. However, these differences can be justified under the viewpoint of Laeven and Levine (2009), as they illustrate that the differences in the governance structure for financial firms lead to less risk-taking. In addition, Akbar et al. (2017) argue that governments impose more interventions and regulations on financial firms than on non-financial firms.

Accordingly, having different governance structures and more government interventions might reduce the significance level of the MSC's effects on dividend policy for financial firms; that is, the role of MSC can be compensated by other monitoring mechanisms such as governance structure and government regulations. For this reason, this chapter goes further to provide an additional test on the interaction effect between MSC and governance variables.

Accordingly, the relationship between dividend distributions and social capital under these outcomes advanced our understanding by providing new evidence of how socio-economic variables can influence a firm's financial decisions. For instance, distributing cash dividends or not indicates that social capital is a determinant of the dividend distributions decision, and this effect is also applicable for financial and non-financial firms.

Regarding the control variables, logit regression in Model-I and tobit regression in Model-IV, which present the whole sample of firms, report that a firm's profitability (ROA) has a positive and significant effect on the firms' dividend policy at the 1% level. This positive relation is consistent with signalling theory (Bhattacharya, 1979), suggesting that profitable firms distribute dividends to show their good performance in the market. Furthermore, the result in both models (Model-I and Model-IV) reports that debt (DEBTR) has a negative impact on the firm's dividend policy at the 1% significance level. This result is consistent with the view of using debt and dividends alternatively in monitoring managers' performance and controlling the problems related to the agency conflict (Crutchley et al., 1999; Jensen and Meckling, 1976). Accordingly, this means firms that have a high debt structure will tend to restrict the internally generated earnings to meet their obligations derived from the costly external financing.

In addition, firm size (FSIZE) has a positive and significant effect on the dividend policy of the UK firms, supporting the agency problem and the related argument of the transaction costs (Crutchley and Hansen, 1989; Lloyd et al., 1985). Under these arguments, large firms have better access to the external funds from the capital market at relatively low costs, which reduces the need for internal funds. Therefore, firms tend to pay more dividends to moderate such problems. Moreover, similar to ROA, the result of the assets turnover ratio (TURN) illustrates that the managements' ability to utilise the assets improves the firms' profitability, which is consistent with the signalling hypothesis.

The logit model (Model-I) shows that stock return volatility (VOL) has a negative and significant effect on the firm's decision to pay dividends. This result is consistent with those of Allen and Rachim (1996) and Hussainey et al. (2011) that firm's dividend policy is a key

driver of stock price volatility. In addition, firm age (FAGE) has a significant and positive influence on the dividend distributions decision at the 1% level. This result is consistent with the firm life cycle, or what is called the maturity hypothesis. Grullon et al. (2002) and DeAngelo et al. (2006) confirm the positive association between firm age and dividend payments. However, Model-IV shows that no significant relationship exists between firm age and dividend policy. In addition, the relationship between Tobin's Q and dividend payouts is positive and significant at the 1% level, a finding that is in line with the signalling hypothesis. On the other hand, as indicated by Model-I, the Tobin's Q variable has no significant influence on the dividend decision, which can be explained as Tobin's Q does not affect the dividend policy decision, but it is relevant when firms try to specify the number of dividends.

Furthermore, control variables such as board independence (NED) have a significant and negative relationship with dividend policy in the logit and tobit models, emphasising the ability of outside directors to improve the monitoring mechanisms. This is consistent with the finding of La Porta et al. (2000) and the substitute hypothesis and similar to the finding of a recent study in the UK (Al-Najjar and Hussainey, 2009). On the other hand, board size (BSIZE) has a negative influence on the firm dividend policy, and this may relate to the view of a large board as a medium of greater expertise and the existence of a skilful team as well as the outside members who bring better contacts that could not be attainable internally (Fiegener et al., 2000). Therefore, this supports the substitute hypothesis of La Porta et al. (2000) and considers the large board size as an efficient monitor. However, this relationship is significant in Model-I and Model-IV at the 5% and 10% levels. Furthermore, the results of the study indicate that a negative influence of audit committee size on a firm's dividend policy is not significant; this is consistent with the finding of (Al-Najjar and Belghitar, 2014).

Finally, the logit Model-II shows that board gender composition (GEN) has a significant and inverse relationship with the dividend distributions decision. This relationship implies that women are more conservative than men in deciding to distribute dividends, as they engage in better monitoring (Adams and Ferreira, 2009). Moreover, Chen et al. (2017b) found that female directors use dividend payout as a governance tool in firms with weak governance structures. However, Model-VI indicates that gender composition has a positive but insignificant impact on the payout ratios.

2.4.2 Additional analyses

This chapter uses additional estimations to assess the robustness of the study outcomes. Particularly, as argued by Fracassi and Tate (2012) and Hasan et al. (2020), this chapter acknowledges the association between the roles of corporate governance and social capital. Accordingly, this can be expressed in two prospective scenarios that are conditional based on the use of corporate governance variables. To illustrate this, the first scenario can view the effect of MSC on dividend policy by considering each corporate governance variable separately to ensure that the outcomes of the main analyses (Model-I and Mode-IV) are not derived from the governance variables or an endogenous effect which might result from considering all governance variables jointly (Elmagrhi et al., 2017). The second scenario employs the interaction between corporate governance variables and MSC in relation to dividend policy as a dependent variable (Elmagrhi et al., 2018; Zona et al., 2018).

Consequently, this chapter considers the MSC and governance variables one by one (NED, BSIZE, ASIZE, and GEN) to ascertain whether the main estimation results are sensitive to the governance roles followed by the firms. In addition, this chapter provides further tests for the interaction effect of MSC and corporate governance variables on the MSC and dividend policy nexus; therefore, the interaction effect between the governance variables and MSC has been incorporated into the regression models (logit and tobit) in relation to the divined policy. To clarify this, the used regressions consist of the same control variables used in Model-I and Model-IV coupled with the interaction variables (MSC*BSIZE, MSC*GEN, MSC*NED, MSC*ASIZE).

Table 2.6[15] presents the estimation outcomes from the first scenario, that is, using the regression by incorporating the MSC and governance variables one by one. To explain this, after keeping the control variables (as used in Model-I) and MSC, the logit regressions incorporate BSIZE, NED, ASIZE, and GEN in Model-VII, Model-VIII, Model-IX, and Model-X, respectively. Importantly, as reported in Table 2.6, MSC is significant in all models, which means that the relationship between MSC and dividend policy is not derived from the joint use of governance variables. Comparably, under the tobit regressions, the control variables (as used in Model-IV) are incorporated in addition to MSC, and then in Model-XI, Model-XII, Model-XIII, and Model-XIV, the tobit regressions incorporate BSIZE, NED, ASIZE, and GEN, respectively in

[15] The marginal effects of the independent variables in logit and tobit regressions are also estimated but not included for abbreviation.

each regression. Similarly, MSC is significant, which confirms the outcomes from the logit regressions.

However, referring to the logit regression outcomes from Model-I that represent the regression outcomes by incorporating all the governance variables together, it is clear that the BSIZE and NED variables are not significant, whereas when each variable is used without other governance variables, the BSIZE and NED variables become significant, but the ASIZE and GEN variables have the opposite outcomes, that is, both are significant when all governance variables are used jointly but are not significant separately.

On the other hand, referring to the tobit regression outcomes from Model-IV, which represent the regression outcomes by incorporating all the governance variables together, it is notable that none of the governance variables is significant, whereas when each variable is used without other governance variables, the BSIZE and NED variables become significant. Consequently, it is notable that MSC is significant in all the models in Table 2.6. The second scenario is based on the interaction between corporate governance variables and MSC. Table 2.7[16] presents the estimations of the interactions between governance variables and MSC. Interestingly, compared to the logit regressions in Table 2.6, which consider each governance variable separately, the logit regressions in Table 2.7 which represent the interaction between MSC and governance variables show that the interaction between MSC and BSIZE results in a significant outcome; this is also true under the interaction between MSC and NED. While the BSIZE and NED variables were not significant in the logit regression in Table 2.6 (Model-VII and Model-VIII), they become significant after the interaction with MSC.

[16] The marginal effects of the independent variables in logit and tobit regressions are also estimated but not included for abbreviation.

Table 2.6. Additional analyses for the effect of MSC on dividend policy. This table presents the logit and tobit estimates and z-statistics in the parentheses. *** p < 0.01, ** p < 0.05, * p < 0.10 indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Independent variables are one-year lagged, industry and year fixed effects already used. Variables' description available in Table 2.2. Note: Model-VII, Model-VIII, Model-IX, and Model-X use BSIZE, GEN, NED, and ASIZE, respectively, in each model for logit regressions, whereas Model-XI, Model-XI, Model-XIII, and Model-XIV use BSIZE, GEN, NED, and ASIZE, respectively, in each model for tobit regressions.

	Logit regressions				Tobit regressions			
	Model-VII	Model-VIII	Model-IX	Model-X	Model-XI	Model-XII	Model-XIII	Model-XIV
	BSIZE	NED	ASIZE	GEN	BSIZE	NED	ASIZE	GEN
BSIZE	0.0768				0.00836			
	-0.413				(0.543)			
NED		-0.251				-0.00606		
		(-1.598)				(-0.454)		
ASIZE			-0.367**				-0.00639	
			(-2.208)				(-0.433)	
GEN				-1.885***				-0.0189
				(-3.221)				(-0.397)
MSC	-0.108***	-0.0780**	-0.0990***	-0.114***	-0.00648**	-0.00681***	-0.00592**	-0.00646**
	(-3.236)	(-2.457)	(-2.984)	(-3.391)	(-2.533)	(-2.758)	(-2.360)	(-2.525)
ROA	11.75***	12.00***	11.86***	11.76***	0.250***	0.245***	0.257***	0.250***
	-8.551	-8.757	-8.655	-8.6	(4.446)	(4.460)	(4.642)	(4.439)
VOL	-1.363***	-1.056***	-1.319***	-1.450***	-0.0688	-0.0345	-0.0590	-0.0689
	(-3.283)	(-2.603)	(-3.142)	(-3.451)	(-1.573)	(-0.816)	(-1.356)	(-1.576)
DEBTR	-0.0989***	-0.0965***	-0.100***	-0.100***	-0.00878***	-0.00846***	-0.00873***	-0.00878***
	(-5.186)	(-5.177)	(-5.216)	(-5.233)	(-5.418)	(-5.259)	(-5.387)	(-5.390)
FSIZE	0.476***	0.469***	0.480***	0.484***	0.0400***	0.0402***	0.0404***	0.0400***
	-10.01	-10.29	-10.13	-9.968	(13.52)	(13.83)	(13.68)	(13.49)
TOBIN'S Q	0.042	0.0777	0.084	0.046	0.0307***	0.0302***	0.0319***	0.0308***
	-0.426	-0.775	-0.831	-0.465	(5.113)	(5.272)	(5.376)	(5.124)
TURN	0.557***	0.535***	0.522***	0.539***	0.0591***	0.0601***	0.0588***	0.0591***
	-6.12	-6.344	-6.04	-5.94	(8.715)	(9.156)	(8.801)	(8.693)
FAGE	0.506***	0.486***	0.518***	0.502***	0.00773	0.00466	0.00879	0.00779
	-6.636	-6.535	-6.834	-6.603	(1.261)	(0.780)	(1.448)	(1.270)
Constant	-4.193***	-3.955***	-3.710***	-3.794***	-0.253***	-0.239***	-0.248***	-0.234***
	(-3.869)	(-3.871)	(-3.515)	(-3.738)	(-3.681)	(-4.021)	(-3.877)	(-3.930)
Observations	2,868	3,053	2,908	2,868	2,609	2,768	2,642	2,609
Pseudo R2	26%	25.84%	26.10%	26.43%	78.26%	79.64%	84.15%	78.24%
Wald chi2 / F	436.21***	457.96***	446.37***	445.48***	17.61***	19.26***	18.27***	17.62***

Similarly, tobit regressions in Table 2.6 (all tobit models) show that none of the governance variables is significant; notably, however, BSIZE, NED and GEN are significant under the interaction with MSC. Indeed, these outcomes indicate that MSC is a vital variable which can affect the dividend policy and, importantly, it has a significant role in the effect of governance variables as a determinant of dividend policy.

However, the overall result from Table 2.6 and Table 2.7 adds to the result from the main analyses, which shows that the level of social capital impacts the dividend policy decision, yet this also means that social connections affect the governance variables, which is clear through the interaction effect between the MSC and governance variables. To emphasise this, by referring to the coefficient for Model-IV reported in Table 2.5, BSIZE has $t = -1.832$, $p < 0.10$ and the interaction variable MSC*BSIZE has $t = -4.039$, $p < 0.01$; NED has $t = -2.793$, $p < 0.10$ and the interaction variable MSC*NED has $t = -3.530$, $p < 0.01$, ASZIE has $t = -0.650$, $p > 0.10$, and the interaction variable MSC*NED has $t = -1.786$, $p < 0.01$. Accordingly, this adds to the previous studies that emphasise the importance of considering the MSC and governance factors (e.g., Hasan et al., 2020; Fracassi and Tate, 2012; Horton et al., 2012).

2.5 Conclusion

Despite the importance of social capital and the extensive efforts to improve our understanding of social capital, few studies have examined social capital in corporate finance. Extant literature clarifies the importance of social capital as a vital factor that influences a firm's financial policies. Consequently, several research works report that social capital can influence information asymmetry, agency costs, financing decisions, and other non-financial aspects such as corporate social responsibility and culture (Amin et al., 2020; Ferris et al., 2017b; Javakhadze et al., 2016b; Tuugi et al., 2014). Therefore, this chapter presents an important investigation into the effect of social capital measured by MSC on the dividend policy using a sample of FTSE 350 firms to add to the corporate finance literature. Accordingly, this chapter uses two basic econometric models that are commonly used in the literature, namely the logit model and the tobit model (Sharma, 2011; Al-Najjar and Hussainey, 2009). The logit model deals with dividend policy as a decision of whether or not to pay any dividend, which takes a value of zero if the company does not pay any dividend or one if it does pay dividends, whereas the tobit model considers the fact that dividend payments can be zero or positive.

Table 2.7. The estimation of the interactions between the governance variables and the MSC on dividend policy.
Model-VII, Model-VIII, Model-IX, and Model-X represent the logit estimations for the interaction between MSC and the BSIZE, GEN, NED, and ASIZE variables, respectively, whereas Model-XI, Model-XII, Model-XIII, and Model-XIV show the tobit estimations for the interaction between MSC and the BSIZE, GEN, NED, and ASIZE variables, respectively. *** p < 0.01, ** p < 0.05, * p < 0.10 indicate statistical significance at the 10%, 5%, and 1% levels, respectively, and z-statistics are in the parentheses. Independent variables are one-year lagged, industry and year fixed effects already used. Variables' description is available in Table 2.2.

	VII	VIII	IX	X	XI	XII	XIII	XIV
	Logit	Logit	Logit	Logit	Tobit	Tobit	Tobit	Tobit
MSC*BSIZE	-0.001***				-0.001***			
	(-4.039)				(-4.039)			
MSC*NED		-0.0124***				-0.0124***		
		(-3.530)				(-3.530)		
MSC*ASIZE			-0.000784*				-0.000784*	
			(-1.786)				(-1.786)	
MSC*GEN				-0.00469				-0.00469
				(-0.568)				(-0.568)
ROA	0.251***	0.278***	0.252***	0.278***	0.251***	0.278***	0.252***	0.278***
	-4.137	-4.446	-4.145	-4.514	-4.137	-4.446	-4.145	-4.514
VOL	-0.0328	-0.0533	-0.0328	-0.0539	-0.0328	-0.0533	-0.0328	-0.0539
	(-0.767)	(-1.190)	(-0.767)	(-1.223)	(-0.767)	(-1.190)	(-0.767)	(-1.223)
DEBTR	-0.00872***	-0.00875***	-0.00898***	-0.00875***	-0.00872***	-0.00875***	-0.00898***	-0.00875***
	(-5.466)	(-5.275)	(-5.678)	(-5.317)	(-5.466)	(-5.275)	(-5.678)	(-5.317)
FSIZE	0.0412***	0.0364***	0.0393***	0.0370***	0.0412***	0.0364***	0.0393***	0.0370***
	-13.48	-12.04	-13.21	-12.36	-13.48	-12.04	-13.21	-12.36
TOBIN'S Q	0.0280***	0.0284***	0.0268***	0.0293***	0.0280***	0.0284***	0.0268***	0.0293***
	-4.831	-4.593	-4.615	-4.8	-4.831	-4.593	-4.615	-4.8
TURN	0.0528***	0.0533***	0.0551***	0.0530***	0.0528***	0.0533***	0.0551***	0.0530***
	-8.028	-7.587	-8.321	-7.687	-8.028	-7.587	-8.321	-7.687
FAGE	-0.00011	0.00403	4.55E-05	0.00529	-0.00011	0.00403	4.55E-05	0.00529
	(-0.0177)	-0.645	-0.00753	-0.853	(-0.0177)	-0.645	-0.00753	-0.853
Constant	-0.226***	-0.211***	-0.207***	-0.208***	-0.226***	-0.211***	-0.207***	-0.208***
	(-3.928)	(-3.535)	(-3.580)	(-3.452)	(-3.928)	(-3.535)	(-3.580)	(-3.452)
Observations	2,966	2,754	2,966	2,797	2,687	2,501	2,687	2,539
Pseudo R2	0.25	0.25	0.26	0.25	0.76	0.76	0.7537	0.77
F-statistics					16.36***	14.08***	15.93***	14.93***
Wald chi2	406.18***	390.62***	415.73***	391.86***				

Furthermore, the study sample contains three different samples: all firms, non-financial firms, and financial firms. However, the outcomes of the multivariate regression indicate that MSC has a negative impact on the firm's dividend policy. Consequently, firms pay lower dividends when a higher number of well-connected directors join the board team. This shows that a high degree of social capital leads to better monitoring and control; therefore, social capital works under the substitution effect between governance quality and dividend payouts (La Porta et al., 2000). This result adds to the extant literature in different ways, such as highlighting the importance of considering the socio-economic factors in explaining the dividend decision, particularly MSC. In addition, concerning dividend distributions, this study uses UK data, where management has the right to make dividend distributions or restrict them by providing an explanation if they do not distribute dividends. Accordingly, the study evidence indicates that shareholders should consider the social capital status of the firm when they make their investment decision. In this regard, this study asserts that this decision should not contradict other financial decisions, such as the level of debt and risk-taking decisions.

Moreover, this study is one of a few that links social capital to financial decisions and enhances our theoretical understanding of social capital. In addition, this study adds to the debate on the differences between financial and non-financial firms. However, the results show that the association between MSC and dividend policy is weaker in the financial firms than in the non-financial firms. Equally important, this study acknowledges the role of corporate governance in affecting dividend policy, and it provides interesting evidence on the interaction effect between MSC and corporate governance in relation to dividend policy. However, the overall results show that MSC is a robust determinant of dividend policy, and it has an important effect in increasing the significance level of corporate governance variables as a determinant of dividend policy.

Finally, the results of this chapter are based on a robust research method with several alternative dividend variables and models. Accordingly, this chapter recommends that future research on corporate governance and dividend policy should not ignore the role of social capital. Moreover, coupled with the agency perspective, regulatory bodies should consider the Higgs Report (2003) to improve the efficiency of the board. In his review, Higgs asserts that in the UK, non-executive directors can work as wealth creation and as a monitoring mechanism at the same time. This view is different to the US regulators' point of view, where the busyness hypothesis is more dominant (Jiraporn et al., 2009; Ferris et al., 2003).

2.5.1 Appendix

Table 2.8. Study sample and industry classifications – micro sector

Note:

Mean refers to the average of the MSC for each industry during the study period.
Freq. refers to the frequency of the firms from each industry.
Percentage refers to the ratio of each industry to the whole sample.

Financial Firms Industry Classification	Mean	Freq.	Percentage
Asset Management	5.934	146	4.01%
Banking	5.713	64	1.76%
Institutional Financial Services	4.991	12	0.33%
Insurance	6.807	37	1.02%
Real Estate	5.100	266	7.31%
Specialty Finance	3.147	114	3.13%
Non-financial Firms Industry Classification	Mean	Freq.	Percentage
Media	4.732	172	4.73%
Home & Office Products	4.761	700	19.24%
Consumer Products	5.461	210	5.77%
Oil, Gas & Coal	5.303	68	1.87%
Biotech & Pharma	5.461	115	3.16%
Industrial Distribution	5.375	561	15.42%
Iron & Steel	5.741	211	5.80%
Technology Services	4.668	222	6.10%
Utilities	5.657	53	1.46%
Unknown	4.710	687	18.88%
Total		3638	

CHAPTER THREE

SOCIAL CAPITAL AND CAPITAL STRUCTURE: UK EVIDENCE

A B S T R A C T

This chapter examines the relationship between social capital and capital structure. The study uses an unbalanced panel of publicly listed UK FTSE 350 firms from 2006 to 2017. Employing a multivariate regression framework and controlling for the endogeneity problem, it provides evidence of how social capital affects the capital structure of firms. After addressing previous research findings, this study focuses on the structural dimension of social capital. The structural dimension is measured using managerial social capital (MSC). The research outcomes are based on the GMM system model, as this is an appropriate model for capital structure studies. The sample consists of three types: all firms, non-financial firms, and financial firms. However, different from the financial firms sample, the whole sample and non-financial firms sample have similar outcomes. The main result is based on the whole sample, which shows that social capital is positively associated with firms' capital structure, as captured by total debt to the book value of total assets, and total debt to the market value of total assets. This positive result is consistent with the pecking order theory, showing that structural social capital alleviates information asymmetry between management and shareholders, resulting in moderation of the costs of issuing new debts to finance new projects. In addition, MSC encourages managers to consider debt in the firm's capital structure. Moreover, it is shown that the positive relationship is consistent with the outcome hypothesis, in which social capital works as a governance mechanism. Having a stronger level of social capital is associated with higher leverage in a firm's capital structure. Nevertheless, the results show that financial and non-financial firms are different under the association between social capital and firm's capital structure. However, financial firms are important in considering social capital, which needs to be considered in future works. Importantly, social capital is a governance mechanism that alleviates agency problems and reduces information asymmetry. Accordingly, the results lead to an important recommendation for firms, managers, investors, academicians and policymakers to consider social capital as a key factor that must be considered in relation to firms' debt policy.

Keywords: Social capital, capital structure, managerial social capital (MSC), UK, financial, non-financial

3.1 Introduction

While the determinants of a firm's capital structure have been studied extensively in the corporate finance literature, the direct link between social capital and a firm's capital structure remains largely unexplored. In this regard, numerous works report that socio-economic attributes can significantly impact financing options (Huang and Shang, 2019; Aggarwal and Goodell, 2011). For example, the capital structure decision is affected by ownership structure (Sun et al., 2016), board interlocking (Li et al., 2019), firm age (Kieschnick and Moussawi, 2018), social and asymmetric information (Tuugi et al., 2014), and cognitive social capital (Huang and Shang, 2019). However, this chapter investigates the relationship between capital structure and structural social capital.

The capital structure of the firm can affect its value in several ways. One of the vital channels is how investment decisions change under different managerial incentives (Jensen and Meckling, 1976). In this regard, it is the responsibility of a firm's management to balance costs such as agency costs and benefits such as tax shields when using debt financing. Increasing the debt proportion in a firm's capital structure and limiting the time of debt maturity can mitigate management entrenchment problems (Harris and Raviv, 1990; Jensen, 1986).

Since Modigliani and Miller (1958) developed the irrelevance proposition, numerous studies have investigated how firms use different sources of capital to finance their investments and maximise their value. Indeed, social capital resources have remained ambiguous in relation to corporate finance and how it might play a role in a firm's financing options. In general, social capital can create protection such as a buffer zone that can alleviate destruction from negative events, particularly at a firm-specific level, and thus it affects a firm's financing and cash decisions (Cheung, 2016). In relevant works, Ferris et al. (2017b) and Gupta et al. (2018) report that social capital impacts the cost of equity financing and, more interestingly, social capital lowers the cost of debt (Hasan et al., 2017a). Moreover, social capital has different dimensions, and this adds to the complexity of understanding the association between social capital and corporate financing decisions. Accordingly, Huang and Shang (2019) argue that social capital needs to be investigated under a firm's capital structure and, importantly, by considering different countries' characteristics.

In corporate finance literature, two contradictory theories explain firms' external financing choices: trade-off theory and pecking order theory. The former postulates that a firm's capital structure is determined by performing a cost–benefit analysis to achieve the best harmonisation

between the expected benefits (such as tax savings and lowering the cost of capital) and the expected costs (such as the cost of financial distress) of using debt (Bradley et al., 1984), and that an optimal level of capital structure exists. According to the pecking order theory of Myers (1984) and Myers and Majluf (1984), firms have a hierarchical order of financing based on adverse selection costs. It predicts that firms prefer internal funds (i.e. retained earnings) to external financing (such as debt or equity). In addition, short-term debt is preferable to long-term debt, and debt financing is preferable to issuing new equity. These preferences arise from information asymmetry between managers and shareholders. Accordingly, it is expected that factors such as social capital will affect capital structure options by alleviating the information asymmetry between different stakeholders (Fogel et al., 2018; Javakhadze et al., 2016b; Hillman and Dalziel, 2003; Schoorman et al., 1981).

In addition, a recent stream of studies elaborate that social capital created through connections between the boards of directors (BODs) and management in different firms (interlocking directorates) increases the likelihood of securing more loans, lowering spreads, and reducing covenant restrictions (Tuugi et al., 2014; Engelberg et al., 2012). Therefore, managerial connections through networks play an important role in improving the flow of information and reputation and reducing monitoring costs. Consequently, financing preferences fluctuate under different managerial preferences and different levels of social capital (Zona et al., 2018; Johnson et al., 2013; Blazenko, 1987). A recent stream of research in finance considers managerial connections in reflecting upon firm-level managerial social capital (MSC) (Javakhadze and Rajkovic, 2018; Ferris et al., 2017b; Ferris et al., 2017a; Fracassi, 2017; Javakhadze et al., 2016b; Tuugi et al., 2014; Fracassi and Tate, 2012; Renneboog and Zhao, 2011), which impacts firms' financial policies.

Previous studies provide evidence of the importance of managerial connections to explain corporate behaviour. For instance, Fracassi (2017) illustrates how directors' and executives' ties impact financial decisions among connected firms. Two main theories – the agency theory and resource dependence theory (RDT) – attempt to explain the relationship between MSC and a firm's capital structure. These theories provide two opposite perspectives. From the managerial opportunistic point of view, agency theory (Jensen and Meckling, 1976) views MSC as a performance reduction mechanism (Fich, 2005; Rosenstein and Wyatt, 1994). On the other hand, the RDT of Pfeffer and Salancik (1978) illustrates that MSC is a resource for value creation and a performance improvement tool. In this view, managerial connections relax resource constraints and align the interests of agents and principals (Zona et al., 2018;

Mizruchi, 1996). Therefore, it is expected that when the BODs assess capital structure decisions, they will monitor management (Adams et al., 2010) and provide the necessary strategic advice (Adams and Ferreira, 2007). In addition, directors and management will use their MSC to access scarce external funds and other resources (Javakhadze and Rajkovic, 2018; Hochberg et al., 2015; Pfeffer and Salancik, 1978).

Indeed, it is important to have a solid governance system to control managerial violations through the decision-making process. In this regard, Hasan et al. (2020) argue that social capital is affected by corporate governance implications, and these have common functions. Generally, Corporate Governance Codes (CGCs) have different implications when dealing with agency problems across different countries. For instance, in the US, non-executive directors are dominant in the composition of BODs, whereas in the UK, executive directors are dominant (Short et al., 1999). However, in the UK, the CGC, which is issued by the Financial Services Authority, recommends that firms raise the proportion of the non-executive directors on BODs to increase board efficiency (Solomon, 2007). For instance, as recommended by the CGC for FTSE 350 firms, 'at least half of the board, excluding the chairman, should comprise non-executive directors determined by the board to be independent' (UK Corporate Governance Code, 2010, p.13).[17] Therefore, the CGC in the UK is not mandatory, and firms can ignore or not comply with the Code. This implies that in the UK, firms need to use available tools to enhance the efficiency of the board; in this regard, social connections can be used to achieve board effectiveness. For example, social connections enhance oversights and reduce the cost of legal interventions (Hasan et al., 2020; Javakhadze et al., 2016b).

Moreover, in the UK legal environment, it is expected that social capital coupled with corporate governance will work as a strong monitoring mechanism (Hasan et al., 2020). Importantly, social capital boosts information flow (Cohen et al., 2008) and the quality of financial reporting (Bhandari et al., 2018); therefore, studying social capital in the UK provides an interesting environment where firms have a number of non-executive directors who build many connections, and following the CGC is relatively flexible. For example, Hoi et al. (2019) show that social capital mitigates agency problems and lessens the opportunistic behaviour of the Chief Executive officer (CEO). Referring to the fact that executive directors are dominant in the UK, the role of social capital can be effective in improving firm performance (Zona et al., 2018). However, social capital is a multidimensional concept, which implies that what can be

[17] See also the CGCs for 2003, 2006, 2008, 2012, 2014 and 2016.

an effective social capital norm in one place (such as the US) may not serve similarly in another place (such as the UK) (Christoforou, 2011). In the same way, Javakhadze et al. (2016a) show that social capital plays a vital role in the financial market development.

To emphasise this, social capital is a significant way of executing contracts. Regulatory bodies such as courts and law agencies help to secure the rights of different parties. The existence of social connections can be seen as a mechanism for contract enforcement (Fafchamps, 1996). This embedded power of social capital can work as a supplementary mechanism to achieve compliance with corporate governance and foster effective monitoring. Importantly, socially connected directors try not to amplify problems because of the costs of reputation loss (McMillan and Woodruff, 2000; Kandori, 1992). Accordingly, the use of social capital can represent a rigid monitoring system, which can be explained under the outcome hypothesis, and it predicts that well-governed firms use more debt in their structure.

However, the majority of studies that explore managerial social connections focus on US firms, with a relatively limited number of studies investigating social connections in UK firms. In this regard, it is clear that in the UK, social connections can play a crucial role in firm performance, particularly in relation to financial decisions. Therefore, this study forms part of the ongoing research focusing on the impacts of MSC on firms' capital structure choices. To fill the gap in the extant literature, this study investigates the relationship between MSC and the capital structure of the firm. Accordingly, this study identifies the MSC variable that is embedded in board/management social networks through connections from current and past employment, connections through education, and connections from other social activities (Fracassi, 2017).

Notably, it is predicted that firms with a high degree of MSC can boost the quality and quantity of information delivered between insiders and outsiders (shareholders and the public), and consequently reduce the costs of adverse selection, as is expected under pecking order theory.

The effect of MSC on firms' capital structure is analysed to test the study hypotheses, given that a reduced amount of information asymmetry results in less use of retained earnings. The influence of socially connected directors on equity use might be difficult to evaluate considering that retained earnings are a constituent part of a firm's equity. Accordingly, this study uses different capital structure measures to determine how social capital influences the firm's capital structure.

In this chapter, all the firms are included in one sample, and then another two sub-samples are employed based on separating the whole sample into non-financial and financial firms.

Thereafter, regression is used to control for governance and firm-specific variables. Consequently, the results of this chapter show that there is a positive relationship between social capital and the capital structure of the firms in the UK. The empirical results of this chapter are consistent with the proposed hypotheses. The results provide new evidence and add to the ongoing research that explores the nature of the influence of social capital on firms' financial policies.

This study contributes to the literature on social capital and capital structure in several ways. First, to the best of my knowledge, this is the first study that examines the relationship between capital structure decisions and social capital in the UK market to identify the behavioural determinants of firms' capital structure (Aggarwal and Goodell, 2014a). Social networking is a vital topic addressed by several regulators, such as the Organisation for Economic Co-operation and Development (OECD). In the US, for example, after the Sarbanes–Oxley Act was introduced, BoDs tended to incorporate more independent directors (resulting in more connections) to ensure the monitoring role was more influential in the firm (Linck et al., 2008). In the UK, the CGCs from 2003 to 2016 pay more attention to the directors' relationships and argue that social networks affect the governance of firms. For instance, the CGC of 2003 recommends that a full-time executive director should not hold more than one non-executive directorship in FTSE 100 firms. In addition, the CGC of 2010 states that an independent director is not independent if he holds interlocking directorships or has significant connections through involvement in other firms or bodies.

Second, previous studies have extensively investigated the association between firms' financing options and corporate performance (e.g., Sun et al., 2016; DeAngelo and Roll, 2015; Aggarwal and Goodell, 2014b; Lemmon and Zender, 2010; De Jong et al., 2008). However, with regard to social capital, the evidence available is limited and focuses on US data (e.g., Hasan and Habib, 2019b; Huang and Shang, 2019; Fogel et al., 2018; Gupta et al., 2018; Hasan et al., 2017a). This study predicts that it is more useful for social capital to be considered in the UK than in the US, as UK firms might differ from US firms, especially in their view of the social networking of BODs (Filatotchev et al., 2016). For example, the two countries have similar corporate governance structures, but the US has been characterised as being more robust than the UK in monitoring the role of firms' directors (Filatotchev et al., 2016; Higgs, 2003). Therefore, this research argues that social capital attributes can advanced the monitoring function.

Third, this study takes a forward step by defining social capital at the structural level using two MSC measures, namely MSC and the adjusted MSC, which yields robust evidence of the effect of social capital and financial policies (e.g., Huang and Shang, 2019; Li et al., 2019; Ferris et al., 2017a; Habib and Hasan, 2017; Fracassi and Tate, 2012). Moreover, the results of this chapter provide new insight into the debate on the role of inclusion/exclusion of financial firms in studying social capital in relation to financial decisions (Javakhadze et al., 2016b; Mizruchi, 1996). Therefore, three types of samples, the whole sample of firms, non-financial firms and financial firms, are employed in the regression analysis based on the FTSE 350 Index.

Finally, this chapter uses the dynamic panel generalised method of moments (system GMM) estimation model to control for endogeneity problems following (Wintoki et al., 2012). In addition, to test the robustness of the study results, and consistent with the expectations of social capital as a means of alleviating information asymmetry, this chapter uses asymmetric information measures to differentiate between social capital rules from different asymmetric information perspectives (e.g.,Huang and Shang, 2019).

3.2 Literature review and hypotheses development

This section presents a review of the common theories and empirical evidence of the relationship between capital structure and corporate governance variables. Accordingly, these common theories and previous empirical studies are used to develop the study hypotheses. In the literature, two fundamental theories explain the capital structure of firms in imperfect markets. The first is known as trade-off theory, and the second is pecking order theory. They provide different explanations of how firms' capital structure is related to managerial behaviour. Specifically, the study explores how social capital is related to capital structure financing options. Both theories of capital structure have been examined and discussed widely in the previous studies; the following two sections will provide a brief review of the theories.[18] However, there are two more hypotheses based on the agency model that explain capital structure decisions: the substitute hypothesis and the outcome hypothesis (Jiraporn et al., 2012; La Porta et al., 2000).[19]

[18] See Myers (2003) and Frank and Goyal (2008) for more details about the trade-off theory and the pecking order theory.
[19] The substitute hypothesis and outcome hypothesis are also used in explaining dividend policy.

3.2.1 Trade-off theory

Trade-off theory suggests that firms follow a target to choose the best financing mix which combines equity and debt financing to maximise firm value. In this regard, firms consider tax shield advantages against interest rates, bankruptcy (Kraus and Litzenberger, 1973), and agency costs, which are related to insolvency problems (Jensen and Meckling, 1976).

Debt financing is associated with the probability of incurring bankruptcy costs, which can result directly from the bankruptcy process, such as the administrative costs, or they might indirectly and negatively affect the value of the firm. However, another related cost can result from conflicts of interest between shareholders and bondholders, which can be addressed by trade-off theory. As illustrated by Jensen and Meckling (1976), the riskiness of investments can be changed if managers use more debt financing. However, equity financing is similar to using the call option, with the value of the option increasing if the risk from underlying assets (e.g. stocks and derivatives) increases (Merton, 1973). Consequently, if managers are working in the best interest of shareholders, they may try to shift operational risks from the shareholders at the expense of the creditors, which is commonly called the asset substitution problem (Merton, 1973).

Nevertheless, lenders or the holders of the debt instruments are not naïve, so they make a debt contract (with monitoring conditions) that prevents managers from making decisions that may negatively impact their interests. In addition, they ask for a higher interest rate premium for investing in corporate debt. Accordingly, as illustrated by Jensen and Meckling (1976), the costs resulting from using more debt, which leads to an insolvency problem, will be transferred to the stockholders. Therefore, trade-off theory implies that firms attempt to maximise their value by using a target leverage ratio, in which the expected benefits of using debt compensate for the costs of doing so. This theory has been empirically investigated to explain capital structure in several works (Dierker et al., 2019; Allini et al., 2017).

3.2.2 Pecking order theory

Different from trade-off theory, pecking order theory postulates that firms attempt to follow a hierarchical order to finance their operations, which is based on adverse selection costs due to the asymmetric information between managers and firms' shareholders (Myers, 1984; Myers and Majluf, 1984). In their work, Myers (1984) and Myers and Majluf (1984) explain that in the managerial behaviour phenomenon, managers follow a decreasing financing order, in which the use of retained earnings is in first place, followed by the debt financing option, and

finally, managers consider issuing new equity. They follow such an order when they are acting in the best interests of the firm's shareholders. On the other hand, opportunistic managers, who prioritise their self-interest over shareholders' interest, will follow a different financing order, which starts with retained earnings and ends with the use of debt financing, with the issuing of equity between these. In this vein, managers alter the use of debt financing to escape from the disciplinary role of debtholders. For instance, given the information asymmetry problem, when managers know more than the shareholders about the situation of the firm, when a positive net present value (NPV) investment opportunity appears, managers may ignore it if they need to use external financing.

This case may arise if shareholders (who have less information than managers) interpret the firm's value based on managers' decisions to issue new equity. Consequently, rational shareholders will read this as a bad sign and accept to buy under-priced equity. Since issuing under-priced equity might allow a value transfer from the current owners to new owners, managers may decide not to use the equity financing option and not to invest in a valuable project, which will improve the value of the firm.

Accordingly, managers can always choose to use internal financing sources for new investment opportunities, as they have lower risk unless they choose a risk-free financing option by using debt instruments, and then they can consider debt financing with low risk as a source of financing. In relation to financing options, Myers (1984) suggests that debt financing can be considered after the internal sources or/and risk-free financing options but with additional risks, as this option has lower sensitivity to the costs of adverse selection. In other words, investors demand a lower adverse selection premium for lower-risk securities. Therefore, under information asymmetry conditions (when managers have more informative than shareholders), to finance a new investment opportunity, pecking order theory posits that financing options follow a specific order preference, starting with retained earnings, followed by preference for short-term debt over long-term debt, and with the final option being equity financing.

Accordingly, in comparison to trade-off theory, pecking order theory postulates that firms have a predetermined ratio of leverage, whereas trade-off theory assumes that firms try to reach a target debt/equity ratio which determines their use of debt (Myers, 1984). Despite its logic, pecking order theory has been criticised, as firms will never need to issue equity since the use of debt is always possible. However, advocates claim that the use of debt is subject to the debt capacity that firms have, which can restrict its excessive use under the pecking order hierarchy,

and this could lead to using the equity financing option (Lemmon and Zender, 2010). Nevertheless, neither theory can clarify all the real-life conditions encountered by firms (Antoniou et al., 2008; Frank and Goyal, 2008; Fama and French, 2005). Overall, recent empirical research provides evidence that supports the hierarchy of financing choices used by firms, which is consistent with pecking order theory, even if they have a predetermined leverage ratio (Allini et al., 2017; Lemmon and Zender, 2010; Beattie et al., 2006; Chen, 2004; Fama and French, 2002). This theory has been empirically investigated in several recent works (e.g., Zeidan et al., 2018; Allini et al., 2017).

3.2.3 The outcome hypothesis

Under this hypothesis, capital structure is a means of 'outcome' of a solid corporate governance system. A low level of corporate governance leads to more severe agency problems. To illustrate this, a poor corporate governance system enables managers to exploit shareholders' interest, and they act in an opportunistic way by working in their own interest as a priority over shareholders' interest. According to agency theory, empirical evidence shows that debt financing plays a vital role in dealing with agency costs (Jiraporn and Gleason, 2007). In addition, as argued by Jensen (1986), as the use of debt financing forces firms to spend money, this results in less available cash for managers, and that limits their ability to spend cash on useless projects. Therefore, managers become more motivated to use debt financing on a suboptimal level, as they do not want to place additional limitations on themselves since they have to pay a constant interest payment or they will not be able to use free cash flow. Consequently, according to Jiraporn et al. (2012), the outcome hypothesis postulates that an inadequate level of corporate governance is associated with a low level of debt. In simple terms, corporate governance quality is positively associated with leverage.[20]

3.2.4 Capital structure decisions and institutional aspects

The role of institutional factors, such as legal, environmental and cultural factors, has several implications in the corporate finance arena. As far as capital structure is concerned, one of the main streams of literature focuses on the role of institutional factors as a governance mechanism in monitoring capital structure (e.g. Huang and Shang, 2019; Aggarwal and Goodell, 2014b; Aggarwal and Goodell, 2014a; Arosa et al., 2014; Aggarwal and Goodell, 2011; Aggarwal and Goodell, 2010; Porta et al., 1998; La Porta et al., 1997). For example, Javakhadze et al. (2016b) illustrate that capital structure reduces the cost of legal intervention.

[20] A similar argument is used by La Porta et al. (2000) on dividend policy and corporate governance quality.

In addition, Coleman (1988) argues that social capital enforces cooperative behaviour between members of a group, while Kandori (1992) demonstrates that it is a disciplinary mechanism that works by building a reputation for honest dealings, so people try not to lose their good reputation.

Environmental factors are important in financing decisions. For instance, La Porta et al. (1997) and (Porta et al., 1998) assert that the role of the legal environment is essential in market development to guarantee the rights of creditors and shareholders and thus the financing options of the firm. In addition, Aggarwal and Goodell (2010) show that countries with a strong legal environment and better control of corruption experience a higher demand for equity. In a related study, Durnev and Kim (2005) show that the legal environment is positively associated with external financing. Similarly, Aggarwal and Goodell (2014b) clarify that there is a strong positive association between the ability to obtain external financing and the level of investor legal protection.

In the same institutional framework vein, cultural characteristics are vital in financing decisions. For instance, Aggarwal and Goodell (2010) provide empirical evidence of the influence of a region's cultural characteristics on market development and consequently on firms' financing options and preferences. On the other hand, firms in countries characterised by different cultural characteristics, secretive cultures, high power distance and uncertainty avoidance, for example, significantly impact capital structure (Anabila and Whang, 2017; Aggarwal and Goodell, 2014a; Arosa et al., 2014). Accordingly, Gungoraydinoglu and Öztekin (2011) illustrate that in addition to the firm-specific variables, environmental and cultural aspects have a significant impact on the capital structure of firms. In addition, De Jong et al. (2008) found that leverage determinants differ across countries, although they concur with the direct influence of country-specific variables on leverage. Moreover, they show that such variables have an impact on firm-specific determinants. Recently, using Hofstede's dimensions of culture, Anabila and Whang (2017) showed that culture impacts capital structure. They argue that societies characterised by secretiveness have more information asymmetry. In addition, Bourdieu (1986b) shows that social capital and culture are closely related. Therefore, this adds to the argument that examining social capital in different countries can result in unique outcomes which provide a better insight into social capital (Huang and Shang, 2019).

Generally, studies have conducted more investigations on environmental and legal influences. Antoniou et al. (2008) classify firms into two broad categories: those in bank-oriented countries

(for example, France, Germany and Japan), and those in market-oriented economies (for example, the UK and the US). They analysed how firms determine their capital structure and found that the structure is influenced by borrower–lender linkages, corporate governance practices, the economic environment, institutions, exposure to the capital market, and the quality of the investor protection system in the country in which the firm is located. Alves and Francisco (2015) also illustrate that specific country characteristics, such as the legal environment, financial environment and financial development, are crucial in determining the capital structure of firms. Therefore, considering such country-specific and firm-specific factors is crucial in the study of capital structure. Accordingly, this study argues that social capital provides a good mean of such factors, that is, country-specific and firm-specific factors, as social capital captures several elements of institutional aspects, in particular, the fact that social capital has an influence on the asymmetric information between different parties such as the shareholders and management results in a reduction in transaction costs (Hasan et al., 2020; Huang and Shang, 2019; Hasan et al., 2017b).

In a related study, DeAngelo and Roll (2015) suggest that the use of managerial attitudes and social norms about debt explains the capital structure dynamic. In addition, using Chinese data, Li et al. (2019) show that social networks created through interlocking directorates improve the efficiency of corporate financing policies through the ability of information and resource exchanges embedded in these social networks. However, these results are limited to traditional interlocking directorates and to the Chinese environment and are therefore difficult to generalise. Consequently, these streams of studies assert that firms' capital structure decisions are closely related to environmental aspects, social norms, culture, and social capital (Huang and Shang, 2019).

In addition, firms' debt structure is affected by corporate governance mechanisms and the quality of the BOD members. Fields et al. (2012) show that the quality of the board and other governance attributes (such as board size, board independence, board diversity, and advisory presence) are effective mechanisms to alleviate the agency cost of debt financing. They show that the monitoring role of the BOD reduces the level of asymmetric information problems and contributes to reducing opportunistic managerial behaviour, which is consistent with the outcome hypothesis. Consequently, this mitigates creditors' perception of the default expectation in meeting loan obligations, which helps to reduce the cost of debt financing. Similar results were reported by (Lorca et al., 2011). However, Klock et al. (2005) show that the quality of the BOD is positively related to the cost of capital.

These contradictory results might relate to the difference in information asymmetry between management and bondholders and between management and investors, or to country-specific characteristics. For instance, Ghouma et al. (2018) highlight a negative association between the cost of debt and board quality among Canadian firms. They assert that information asymmetry has a significant impact on this relationship, but their results differ for firms under the Quebec government, where they have better shareholder rights protection. Additionally, Johnson et al. (2013) assert that financial relationships should be studied in different countries, as the majority of studies focus on the US, and they emphasise the importance of the role of social capital embedded in directors' and executives' social networks. However, in addition to the ambiguity of the role of social capital in finance, the argument of Johnson et al. (2013) about financial relationships raises an additional question about the difference between financial and non-financial firms in relation to social capital and financing decisions.

3.2.5 Social capital and financing decisions

Social capital works as an effective system that stimulates honest transactions and alleviates opportunistic behaviour. Therefore, it is a governance mechanism that plays an effective monitoring role, which enhances the functions of BODs (Hasan et al., 2020). For instance, Coleman (1988) argues that secure social networks provide the opportunity to implement dynamic cooperative behaviour. Social capital works as a disciplinary mechanism since well-connected members fear the consequences of a loss of reputation (Javakhadze et al., 2016b; Kandori, 1992). Therefore, it improves economies and supports reputation building through honest transactions (Javakhadze et al., 2016a; Kandori, 1992). Moreover, social capital provides an alternative mechanism to solve conflicts between network participants; for example, freely available resources increase cooperation and reduce the costs of the legal intervention (Javakhadze et al., 2016b).

In addition, social capital works as a monitoring device, enhancing trustworthiness among agents, removing external financing barriers, and facilitating financial transactions by reducing economic contracting costs. For instance, Hasan et al. (2017b) provide evidence that firms located in high social capital areas have a lower degree of bank loan spreads and low at-issue bond spreads when they issue new debt in public. In addition, Gupta et al. (2018) indicate that firms in such areas can benefit from social capital, as it provides a societal monitoring mechanism.

Social capital characteristics affect corporate behaviour, as they play an important role in reducing self-serving behaviour, which benefits shareholders but ignores the interests of other stakeholders. In this vein, social capital is considered as a corporate governance mechanism (Hasan et al., 2017a). In addition, Hasan et al. (2017a) conclude that social capital within a firm's headquarters has an environmental effect that impedes tax avoidance by companies. Similarly, Huang and Shang (2019) show that social capital mitigates agency problems between managers and shareholders. They hypothesise that it works as a substitute mechanism in using debt as a market discipline. Their results are more pronounced for firms with more severe information asymmetry. Similarly, Hoi et al. (2019) found that social capital alleviates agency conflicts by constraining the managerial opportunism which comes from rent extraction compensations for the CEO.

Social capital is a channel of information sharing and improves the flow of relevant and meaningful information, which has a positive impact on the economy. The information resides in and is transferred through social networks, which allow a better level of efficient information availability, and this reduces information asymmetry and improves the economy (Javakhadze et al., 2016b).

The idea of value-relevant information that is deep-seated in networks has several implications for social capital studies. For instance, Fafchamps and Minten (1999) argue that in the agricultural sector, the importance of social networks is equal to that of labour or human capital, facilitating successful trade. In this regard, social networks have several advantages, such as the exchange of relevant and useful information about market conditions, elimination of contractual obstacles, the provision of trade credit, and moderation of risk. Similarly, Hong et al. (2005) illustrate that investors use the power of word of mouth to communicate and exchange information about stock prices with each other. In addition, using the social connections from education networks between portfolio managers, Cohen et al. (2008) found that connections held by portfolio managers help them to outperform those who are not connected by eliciting larger bets on firms they are connected to through their network. In addition, Cohen et al. (2008) assert that portfolio managers with good education connections have informational advantages over those who are not connected, and they predict that social networks can work as an effective device for information flow into asset prices. Granovetter (2000) demonstrates that social connections play a crucial role in collecting helpful information about finding job opportunities, while Hochberg et al. (2007) show that having good connections in a venture capital network can enhance investment performance.

Social capital has many dimensions and is measured using different approaches depending on the nature of the study. Considering it at firm level, Javakhadze et al. (2016b) illustrate that firms with a higher level of MSC can obtain better external financing and better financing constraint conditions, and improve their investment-to-Tobin's Q sensitivity. Using an international sample, Ferris et al. (2017b) show that MSC has an inverse relationship with firms' cost of equity. Moreover, Fogel et al. (2018) illustrate that social capital is vital for borrowing decisions; in particular, they show that social capital held by firms' Chief Financial officer (CFO) helps them to issue new loans with fewer covenant restrictions and fewer loan spreads.

Social capital reduces information asymmetry through its structural nature and the reputation of network members. As defined by Woolcock (1998), higher network density is related to a higher degree of social capital through trust, information, and the capability to depend on norms of reciprocity implicitly rooted in a social network. Chuluun et al. (2014) argue that firms with a high level of social capital are associated with better investor recognition, better information flow, and high exposure to media coverage, which reduces asymmetric information between insiders and investors. Accordingly, personal ties between borrowers and lenders minimise loan costs and insulate borrowers from macroeconomic shocks to credit supply, which demonstrates that social networks lead to better monitoring or better information, with the connections at higher levels allowing access to more insider information (Karolyi, 2018; Engelberg et al., 2012).

Accordingly, firms with a high level of connections can use these when considering their financing options. A recent study conducted by Huang and Shang (2019) found that firm leverage was negatively associated with social capital. However, the study covers US sample firms; although they have some shared characteristics with UK firms, they also have significant differences in governance and managerial ability to extract resources (Siepel and Nightingale, 2014). These differences can be related to environmental and legal aspects (La Porta et al., 1997). More importantly, they can be explained by the differences between CGCs and practice.

In addition, it is important to emphasise that since social networking is a unique approach for creating social capital among board/management members, these networks can be created through interlocking directorates. Indeed, compared to US regulations, the UK has a different view on interlocking directorates. For example, in the US, it is forbidden for competing firms to be represented on each other's boards; this has been in place since 1914 in Section 8 of the

Clayton Act. There is no comparable law in the UK, although the CGC of the UK suggests that the CEO of FTSE 100 firms should not hold more than one non-executive directorship. However, the CGC in the UK recommends that FTSE 350 firms do not include more than 50% of independent directors on their board, which is consistent with Higgs (2003), who views such a directorship as a source of value creation for firms.[21] The US regulator has a more conservative view than the view in the UK, and this can lead the UK regulatory bodies to rethink about an interlocking directorates, or what is known as multiple directorships, particularly between competitive firms in the same sector.[22]

Consequently, the variation in the expected effects of social capital in the UK and those in the US must be considered. Accordingly, it is difficult to generalise the results obtained by Huang and Shang (2019), who investigated the leverage and social capital in the US environment. The authors argue that their results are explained under the substitution effect between social capital and governance. Bearing this in mind, their study controls for several financial variables but not for governance variables, which also contribute to firms' capital structure (Kieschnick and Moussawi, 2018; Jiraporn and Gleason, 2007). In addition, they use two measures of social capital that are positively related and measure the macro level of social capital, together with the state level and county level. However, Javakhadze et al. (2016b) assert that social capital at the micro level (i.e. MSC) is a significant factor that influences firms' financial decisions. They use the Ordinary Least Squares (OLS) regressions, which have some limitations compared to other models such as system GMM that can better handle endogeneity problems (Flannery and Hankins, 2013; Wintoki et al., 2012). On the other hand, Huang and Shang (2019) use the Two-Stage least squares approach with a historical degree of racial segmentation variable to predict social capital, which is based on relatively old data from 1960.

Finally, previous studies on capital structure agree that capital structure models, which cannot control for the governance or behavioural features of firms, are inadequate (Jiraporn et al., 2012). Therefore, this study provides new evidence of the relationship between firms' MSC and capital structure choices by considering governance and behavioural aspects. In addition, the study seeks to address the weaknesses in the extant literature in several ways to fill the

[21] Studying the differences between the UK and US laws is outside the scope of this study. However, those who are interested in corporate governance practices between the US and UK can consider this in future.

[22] This study uses four ways of creating social networks from current employment, past employment, education, and social activities. Therefore, interlocking directorates can be restricted to the current employment connection, which is a part of the MSC index used in this study, and this clarifies that the use of the social capital concept is wider than the concept of interlocking, but both concepts are interrelated to each other. See, for example, Horton et al. (2012).

research gap by investigating the relationship between social capital and the capital structure of the firm.

3.2.6 Hypotheses development

Recently, the concept of social capital has emerged as an important factor in economic development and other social sciences such as politics and sociology. However, in corporate finance, its implications have received inadequate consideration. Social capital is defined in previous studies in various ways, encompassing social norms, trust, and reciprocity (Putnam et al., 1994). Given the divergence in the definitions, it has been classified into different dimensions and/or levels. Generally, these vary between structural social capital and cognitive and relational social capital (Nahapiet and Ghoshal, 1998). Empirically, the dimensions are applied at different levels (individuals, firms, regions, and countries).[23]

At the firm level, social capital is measured through executives' and/or directors' relationships, which represent MSC at the firm level (Ferris et al., 2017b; Fracassi, 2017; Javakhadze et al., 2016b; Fracassi and Tate, 2012). Indeed, it is crucial to understand how socio-economic variables affect firms' decisions. In particular, this study analyses the relationship between firms' capital structure decisions and social capital. It argues that social capital works as a governance mechanism which alleviates agency problems and reduces information asymmetry (Javakhadze et al., 2016b). To illustrate this, due to concerns about loss of reputation, social capital acts as a disciplinary tool (Javakhadze et al., 2016b; Kandori, 1992; Diamond, 1989) and as a monitoring device (Gupta et al., 2018; Hasan et al., 2017b), and it has an institutional influence (Hoi et al., 2019; Huang and Shang, 2019; Hasan et al., 2017a). Moreover, it works as a channel of information sharing (Javakhadze et al., 2016b; Cohen et al., 2008; Fafchamps and Minten, 1999) and reduces information asymmetry (Huang and Shang, 2019; Qiu et al., 2019; Ferris et al., 2017b; Javakhadze et al., 2016b; Tuugi et al., 2014).

Under pecking order theory, to determine capital structure financing options, it is vital to consider the extent of information asymmetry between the company and the providers of external capital (either debt or equity). In addition, capital providers can access relevant and reliable information about the financial conditions of the borrower and can undertake additional monitoring of borrowers' behaviour; it is crucial for fund providers to be considered by decision makers to determine capital structure (MacKie-Mason, 1990). However, the existence

[23] Following Javakhadze et al. (2016), this study focuses on the structural dimension of social capital, particularly MSC. However, Javakhadze et al. (2016) provide a detailed explanation of the difference between the two dimensions of social capital.

of information asymmetry between decision makers inside the firm and shareholders, which leads to more obstacles to issuing new securities, incentivises decision makers to prefer the use of internal funds rather than external funds. Therefore, a greater level of social capital in a firm can lead to alleviation of asymmetric problems and facilitate the use of debt in its capital structure. In other words, decision makers will find that the use of external debt is more attractive for them, as they have a low level of information asymmetry.

In addition, pecking order theory expects that firms with low information asymmetry problems between decision makers (insiders) and public investors (outsiders) will issue new securities at lower costs. Therefore, it is expected that firms which have a higher degree of information asymmetry problems will use more internally generated funds, issue short-term debt securities, and avoid the use of long-term debt or equity funds to escape from the higher discount rates related to external funds. Accordingly, decision makers who work under a high level of social capital will tend to use more debt in their capital structure if it is accessible (Myers and Majluf, 1984).

Based on the explanations of pecking order theory and considering social capital as a governance mechanism, it is expected that social capital will alleviate conflicts of interest between shareholders and managers, as it assures shareholders that managers are working in their best interests. In this regard, social capital reduces agency costs by prohibiting managers from choosing a sub-optimal level of debt. Bearing that in mind, debt makes firms committed to pay out cash, which results in reducing the available amount of free cash flow available to managers, which they might misuse for their self-interest (Jensen, 1986).

In addition, capital structure can be viewed as an outcome of corporate governance quality. In this case, the quality of corporate governance can be determined by social capital attributes, in which it is a disciplinary tool. This is consistent with the agency theory viewpoint, whereby debt reduces agency costs by adding more barriers to the use of free cash by opportunistic managers. Therefore, it is expected that managers who have a high level of social capital will use debt financing. Consequently, it is expected that a low level of social capital, which is associated with poor quality governance, will be related to a low level of leverage. In other words, there is a positive relationship between social capital and leverage.

Under the view of social capital as a governance mechanism, the relationship between social capital and capital structure can be explained using the substitution hypothesis, with social capital and the use of debt being substitutes in alleviating agency costs. Therefore, both

variables are substitutes, as they play the same role. Accordingly, the existence of social capital can replace the use of debt as a tool to control agency costs. Another rationale behind the substitution hypothesis is the need for reputation building, which enables firms with weak governance to repeatedly go to the capital markets to obtain external funds. For firms with a good level of governance and social capital, there is little need to use debt to build a good reputation. In addition, board members with MSC have a reputation in the market that they need to protect, and therefore they will always try to maintain their good reputation (Kandori, 1992).

Accordingly, previous studies illustrate that social capital is a means of quality monitoring, where board members try to protect their reputation and they are motivated to work in an effective way. In addition, social capital alleviates asymmetric problems, which are expected through connections inside and outside the firm. Consequently, it is expected that firms with a high level of social capital will be able to use a higher level of debt than those with a low level of social capital. In other words, it is expected that social capital will have a positive effect on the use of debt financing. However, this use of debt financing is subject to the priorities of the available financing options. Overall, under the pecking order hierarchy and the outcome hypothesis, the main research hypothesis is:

H_1: The greater the MSC in a firm, the greater the use of debt in its capital structure.

However, similar to corporate governance, it has been as argued that social capital may vary under the financial and non-financial firms (e.g, Akbar et al., 2017; Johnson et al., 2013; Mizruchi, 1996). Nevertheless, the evidence in this chapter considers the financial and non-financial firms separately. Indeed, differences between the two sectors vary based on different viewpoints. To illustrate this, the financial sector encounters unique challenges and uncertainties, and therefore it works under a higher level of risk than non-financial firms, which can be related to the nature of these firms, such as liquidity and bid–ask spread (Abdelbadie and Salama, 2019; Akbar et al., 2017). In this regard,p.88Abdelbadie and Salama (2019) argue that ‘banks with many indirect connections to other banks or that act as bridges between unconnected banks would have access to more accurate and reliable information, usually with almost no additional cost’. This can be added to the perspective that highlights the importance of financial firms such as banks in creating social networks as a means of social capital. However, it is well known in corporate finance literature that the financial firms have a particular consideration, which is related to the regulations and government’s intervention to

protect the interest of shareholders and all other related stakeholders (Akbar et al., 2017). These differences between financial and non-financial sectors are questionable in relation to social capital, particularly when it is related to the firm's capital structure. Accordingly, this study adds to hypothesis H_1 by testing the relationship between social capital and capital structure using the financial and non-financial sectors. Accordingly, the second hypothesis proposes:

H_2: The relationship between social capital and capital structure does not change when using the financial and non-financial firms separately.

Moreover, as argued in the literature, the role of social capital is significantly affected by its ability to influence the information transfer, consequently alleviating asymmetric information. Accordingly, to ensure that the main study hypothesis is consistent with the basic research argument and to explore the influence of information asymmetry resulting from high social capital, the following hypothesis is proposed:

H_3: The greater the MSC at firm level, the lower the information asymmetry.

3.3 Social capital measures

Measuring social capital varies depending on the variation in its definitions. Indeed, there is no one generally agreed definition (Sacconi and Antoni, 2010; Rupasingha et al., 2006). In finance, two streams are used to proxy social capital scales, one from the micro-level perspective, and the other from the macro-level perspective. At the micro level, social capital focuses on the relationship between individuals, which reflects the embedded assets that benefit those connected through their networks. At the macro level, social capital is considered as a means of public good; it refers to community-level resources that tend to focus on civic norms, trust, membership associations, and voluntary work. Accordingly, Lins et al. (2017) assert that corporate social responsibility is a good measure to proxy cognitive social capital.

3.3.1 Micro level of social capital

Several studies agree that social capital derives its value from social networks. In this regard, Bourdieu (1986b) links social capital to structural theories, in which it is defined as an asset that implicitly exists in social networks. In the same vein, Bourdieu and Wacquant (1992, p.119) provide another definition of social capital by describing it as 'the sum of the resources, actual or virtual, that accrue to an individual or group by virtue of possessing a durable network of more or less institutionalized relationships of mutual acquaintance and recognition'. Furthermore, Bourdieu (1986a, p.249) states that 'the volume of social capital possessed by a

given agent … depends on the size of the network of connections that he can effectively mobilize'. Therefore, the volume or size of the social network is a key social capital determinant.

Following Bourdieu's social capital definition, Lin (1999) proposes a social capital theory in which social capital is a set of resources embedded in a social network. He considers social capital to be the source of a capital asset embedded in the network and argues that any violation of this concept and measure will lead to inaccurate analysis. In this social capital view, it becomes relevant for researchers to measure social capital based on the network theory using centrality measures (Wasserman and Faust, 1994; Freeman, 1979). Therefore, considering that it is possible to observe social networks and their theoretical base to reveal a social capital scale, social networks can be used to measure social capital (Van Der Gaag and Snijders, 2005). For instance, Wellman and Frank (2001) confirm that the network size of an individual is a key determinant of the supportive behaviour they receive.

In business, Burt (2000) shows that social capital is the sum of a business person's connections. Regarding the centrality measures of social networks, Borgatti et al. (1998) argue that the value of social capital is closely associated with the degree measure of centrality that provides the size of social networks. They also assert that the higher the number of connections held by an agent, the greater the level of social capital because of the agent's ability to obtain more resources through the connections.

3.3.2 Macro level of social capital

Social capital is related to social interaction, such as the frequency of socialising and trust in others, which are related to a wide range of consequences from governance performance and healthcare status to individual satisfaction and happiness. In this regard, Putnam et al. (1994) and Putnam (2000) show that social capital is linked to governance quality and economic performance. In addition, Putnam et al. (1994) provide strong evidence of the close association between social capital proxies and economic performance in Italy.

Putnam (2000) developed a comprehensive index, which is considered to be one of the most highly cited social capital indices. The index metric is based on a national survey to reflect social capital at the state level in the US. The index contains items that include membership in voluntary organisations, project works with the community, visiting friends, time spent entertaining at home, ensuring that people are honest, ensuring that they can trust in people, serving on local organisation committees, serving as an officer for local organisations or clubs,

attending meetings in the local area about school affairs, organisations per capita, and voting levels. The data are accessible from Putnam's (2000) official website.

Several empirical studies have collected information about social capital by using survey methods. For instance, using the World Values Survey (WVS) of 29 market economies, Knack and Keefer (1997) show that social trust and civic cooperation have a significant effect on economic performance. Sudarsky (1999), also drawing on the WVS, measured social capital from a set of dimensions including civic republicanism, civic participation, social control, institutional trust, horizontal relationships, information, and transparency. In addition, several country-based surveys built useful social capital proxies. Based on previous works on social capital, Onyx and Bullen (2000) used a questionnaire and distributed it to five communities in Australia to develop a proxy for social capital. They developed their social capital measures in terms of trust, reciprocity, social norms, participation in networks, and social agency.

Narayan and Pritchett (1999) used a social capital and poverty survey to develop a social capital measure. They included three main dimensions: group membership, the characteristics of the groups, and individuals' level of trust in various groups and their perception of social cohesion. In addition, Karlan (2005) shows that experimental economics can be used to assess and predict social capital. He found that trust was related to social capital measures but indicated that it was not adequate as a valid proxy of social capital. Furthermore, Guiso et al. (2004) considered community social characteristics involving the incidence of blood donation and electoral participation to investigate the effect of social capital on financial development across different Italian regions. They argue that these two measures are fundamental components of social capital since they are outcomes of social pressure and internal norms. Moreover, they criticise the use of social capital measures, as they contain contaminated factors such as the quality of law enforcement. Consequently, the use of social capital in business and finance is not derived from one social capital dimension (Amin et al., 2020; Cheung, 2016; Degli Antoni and Sacconi, 2011).

3.3.3 Social capital measures in corporate finance

The variation in social capital measures influences their use in corporate finance studies. Accordingly, it is possible to categorise two streams of studies that explore social capital in finance. First, social capital has been measured through social networks. This measure is

derived from the structural dimension of social capital at the micro level. Second, social capital can be measured at the macro level, which refers to the cognitive dimension of social capital.[24]

At the micro level, El-Khatib et al. (2015) used centrality measures including degree, betweenness, closeness, and eigenvector centralities.[25] They argue that CEO centrality measures have a significant influence on firms' mergers and acquisitions. Accordingly, El-Khatib et al. (2015) report that the connections held by CEOs enable them to collect and monitor private information, which facilitates value-creating acquisition decisions. Fracassi and Tate (2012) calculated the external connections between directors and CEOs using the BoardEx database by adopting an index that includes four dimensions: linkages from education, social activities, current employment, and prior employment. They found that more external network ties with CEOs related to more value-destroying acquisitions and weakened the quality of board monitoring. Fracassi (2017) used a similar social network index and reports that two firms with connections with each other have similar capital investments, and that those with a higher degree of centrality exhibit better economic performance.

In the same vein, Engelberg et al. (2013) illustrate that a higher degree of network centrality brings several advantages, such as information advantages, to corporate financial policies, which enhances firm value and results in better business decisions. Moreover, Larcker et al. (2013) obtained similar findings. Javakhadze et al. (2016b) adopted an index similar to that of Fracassi and Tate (2012) and Fracassi (2017). In addition, Javakhadze et al. (2016b) illustrate that degree centrality is a social capital measure which can be used to proxy for MSC, also noting: 'In corporate finance, the degree centrality (size) of the social networks is often used to measure the benefits derived from a network. But researchers are reluctant to use the term "social capital" and refer to network effects or the advantages resulting to one's social networks' (Javakhadze et al., 2016b, p.44). In a related study, Javakhadze et al. (2016a) used the degree-centrality measure of the social network to measure the MSC index as a social capital proxy, finding that the collective benefits of social obligations and informal contacts through social networks impact financial development.

Ferris et al. (2017b) argue that managerial social connections with financiers are associated with firms' cost of financing. They used degree centrality to empirically estimate social capital

[24] See Hasan et al. (2020) for more classifications of social capital, which vary depending on the nature of the studies.

[25] El-Khatib et al. (2015) provide more details about these measures (pp.375–376). In addition, Wasserman and Faust (1994) provide a further explanation of centrality measures at different levels (individuals and groups).

between financiers (investment companies, private equity, specialty and other finance, or banks). However, some finance studies use structural social capital (Burt, 1983; Freeman, 1979), while others consider the macro level of social capital, which have different implications for corporate finance.

Various empirical studies have explored the macro level of social capital in relation to corporate finance decisions. These measures of social capital consider different data sources for scaling purposes, such as the Northeast Regional Centre for Rural Development (NRCRD). These data were employed by considering participation in presidential elections and the rate of response to the population survey to capture the norm aspect of social capital. The NRCRD also captured the social network aspect by considering the number of non-profit organisations and the number of associations (Rupasingha et al., 2006 ,RGF hereafter). Rupasingha et al. (2006) used principal component analysis (PCA) to produce a social capital index for US counties. The RGF index covers ten components from each county, which consider the existence of social organisations in each of them. In particular, the RGF considers the number of fitness centres, religious organisations, civic organisations, labour associations, bowling clubs, golf clubs, political organisations, professional organisations, sports organisations, and business organisations. The index has been used by many researchers, including Putnam (2007), Jha and Cox (2015), (Hasan et al., 2017b), and Hasan and Habib (2019b). Habib and Hasan (2017) used PCA for 1997, 2005 and 2009 to build a social capital index from the NRCRD, similar to the index of Rupasingha and Goetz (2008). In addition, some researchers have used Putnam (2000) index, which is a state-level index that can capture certain features that may not be captured at the county level of social capital. Huang and Shang (2019) used social capital following the Putnam and RGF indices, indicating that the correlation between the two indices was positive, and that both could be used as social capital proxies to examine the social capital relationship with firms' capital structure decisions.

Indeed, the fact that there is no consensus in the literature on social capital measures increases the ambiguity surrounding the research results. More specifically, in corporate finance, the empirical evidence indicates that in addition to its ability to facilitate access to external financing, social capital is a source of information which alleviates the degree of asymmetric information. It also restricts managerial opportunistic behaviour (Javakhadze et al., 2016b). Similarly, Huang and Shang (2019) report that social capital reduces the need for corporate borrowing and mitigates agency problems. These contradictions in previous works might be due to the definitions and measurements of social capital. Therefore, it is essential to examine

how social capital dimensions may differ if they are considered in relation to financial decisions.

The literature offers mixed outcomes, which increase the ambiguity concerning social capital measures and their influences on several factors, such as financial factors, resulting from ignoring the nature of the social capital dimension. However, several recent studies have attempted to validate a social capital measure that can mitigate the contradictions in previous studies and motivate organisations and regulatory bodies to be more aware of the importance of recognising social capital under different dimensions.

A recent OECD paper by Scrivens and Smith (2013) illustrates that social capital does not have one definition, but several approaches need to be identified. Their paper identifies four aspects that conceptualise and measure social capital: the prevalence of trust and cooperative norms, the level of civic engagement, relationships at the personal level, and the support of social networks. These social capital scopes are linked with several foci. For instance, network support builds on personal relationships, whereas trust elements have been included in civic engagement and cooperative norms. Accordingly, Lins et al. (2017) argue that the first two scopes refer to sociology and the use of social capital as a resource for individuals, built through networks. On the other hand, the other two scopes frequently link social capital with politics and economics, which present it as a resource for support cooperation at the group, community, or societal level.

3.4 Sample, model, and variable construction

The focus of this study is the UK market, where social capital is stronger than in the US (Filatotchev et al., 2016). Therefore, the study investigates how social capital can influence a firm's capital structure choices. Accordingly, this study follows previous studies by using MSC as a social capital measure (Ferris et al., 2017b; Fracassi, 2017; Javakhadze et al., 2016b; Fracassi and Tate, 2012). Furthermore, this study provides an additional measure of social capital, adjusted MSC (ADJ-MSC), to obtain more robust outcomes. However, both measures are based on the structural social capital dimension.

3.4.1 Sample and data

UK data from FTSE 350 Index constituents[26] are used from the period 2006–2017. All FTSE 350 firms are considered if they were part of the Index at some point during the study period, which helps in minimising survivorship bias.[27] In the UK, a number of governance and social developments occurred during this period. For instance, the CGC of 2010 emphasises that for all FTSE 350 companies, 50% of the board should be independent non-executive directors, who could significantly impact MSC. The sample firms needed to meet the following criteria to be included in the study. First, for the MSC variable, they should have available information that covers directors' networks through current employment, past employment, education, and other activities (Goergen et al., 2019; Fracassi and Tate, 2012). Second, the firms should have data available for corporate governance variables, extracted from BoardEx. Third, firms should be included in the DataStream database, which is used to obtain market and financial data. The BoardEx data were then matched with DataStream/Worldscope data using the corporate International Securities Identification Number code.[28] Consequently, the final study sample consisted of an unbalanced dataset covering 4,325 firm-year observations and 333 unique firms. Consistent with the most recently published research in corporate finance, the winsorisation option was used for all the control variables at the 1st and 99th percentiles to reduce the effect of outliers (e.g., Javakhadze et al., 2016b).

3.4.2 Dependent variables

The main purpose of the study is to explore the effects of social capital on the capital structure of firms. It considers two capital structure proxies: book leverage, which is estimated as the book value of total debt divided by the book value of total assets (Huang and Shang, 2019; Antoniou et al., 2008), and market leverage, which is calculated as short-term debt plus long-term debt divided by market capitalisation (Huang and Shang, 2019; Kieschnick and Moussawi, 2018).

3.4.3 Independent variables

Generally, social capital has been classified under two basic dimensions: the structural and cognitive dimensions (Nahapiet and Ghoshal, 1998). In the structural dimension, which is the

[26] The study first incorporated all UK market firms, but after the data were filtered to match the BoardEx and DataStream databases and subject to the network data availability for the UK, 50% of the selected firms were lost after matching the FTSE all firms with BoardEx data. However, in comparison to the FTSE350 firms, 80% of the firms have available data. Generally, data in Europe are not covered as adequately as in the US, although the UK market is still covered better than other European countries (e.g. Goergen et al. 2019).
[27] BoardEx has had a significant data update since 2006 (see Larcker et al. 2013).
[28] Some missing data were collected from FAME, Bloomberg, annual reports, and https://www.gov.uk/.

primary measure in this study, it is determined based on the social networks between agents (the connections of directors and executives). In this vein, social capital is considered as an asset implicitly residing in social networks that can be used to achieve the best use of the asset (Lin, 1999; Burt, 1992). Accordingly, the greater the number of connections held by a specific agent, the higher their level of social capital. Consequently, social capital can be assessed by determining the size (degree) of the social network (Burt, 1983; Freeman, 1979).

This chapter refers to the structural definition of social capital by identifying MSC from the size of the social network of a particular agent sitting on the BOD or management team of the sample firm. It then calculates the aggregate value of all agents in a specific firm to reveal the firm-level social capital (Ferris et al., 2017b; Fracassi and Tate, 2012; Horton et al., 2012). MSC is determined using four networking dimensions: current employment, namely two individuals currently connected by working for the same firm and/or sitting on the same board; past employment, namely two individuals connected if they worked for the same firm and/or were on the same board at some time in the past; educational networks, namely if they attended the same higher education institution within a one-year overlap;[29] and other social activities, namely connections between two agents if they are members of the same club, charity, or other organisation at the same time. However, this study only considers connections from educational networks and other social activities if the agent has connections from current or previous employment.[30] The firm-level MSC index is then estimated as the sum of the four types of connection for each year from 2006 to 2017.

$$MSC_{it} = \sum_{n=1}^{i}(CEC_{it} + PEC_{it} + EDC_{it} + OSAC_{it}) \quad \text{(2.1)}$$

where

MSC_{it}: managerial social capital for firm *i* at time *t*.
CEC_{it}: the current employment connections of directors/managers for firm *i* and time *t*.
PEC_{it}: the previous employment connections of directors/managers for firm *i* at time *t*.
EDC_{it}: the connections through education of directors/managers for firm *i* at time *t*.
$OSAC_{it}$: other social activity connections of directors/managers for firm *i* at time *t*.

[29] Previous studies have considered a two-year overlap, but for this study a one-year overlap is a more precise measure to guarantee that people have a greater opportunity to meet.

[30] The study attempts to ensure that the connections can take place under the current employment, which means the connections from current employment are essential to obtain the whole index value. However, people have more connections through other sources, which can also affect the use of social networks. For instance, Fracassi and Tate (2012) attempted to ensure that agents' connections were effective by contacting the agents (CEOs) and social activity organisations (such as charities, clubs, and not-for-profit organisations). Moreover, BoardEx provides the size of the agent network based on the four aspects of MSC regardless of the current employment conditions, whereas this study postulates that agents should be working on using their connections.

Furthermore, different from previous studies, this study includes an industry-adjusted measure of MSC to ensure that the results are not an outcome of a specific industry, which may have been the case in previous studies. Accordingly, the average MSC in each industry is calculated, and then the difference between MSC at time (t) for a firm (i) and the average MSC in the industry is estimated.[31]

3.4.4 Control variables

A number of control variables are considered in the study. Specifically, it controls for different financial variables in addition to the lagged dependent variable to control for capital structure in the previous period. Flannery and Hankins (2013) argue that lagged capital structure must be included in capital structure studies. This study controls for firm size defined as the natural logarithm of total assets, as larger firms have more business activities and earnings. Therefore, they can go to the capital markets more frequently to raise debt, whereas smaller firms have lower debt ratios since they are subject to higher asymmetric information problems (Lemmon and Zender, 2010). In addition, pecking order theory expects that firms which generate more internal funds will not use debt before considering internal earnings. However, these predictions contradict the free cash flow theory (Antoniou et al., 2008). The profitability ratio is therefore included, measured as earnings before interest and tax (EBIT) to total assets.

In addition, the natural logarithm of the book value of total assets is used to control for firm size, which is expected to have a positive association with leverage, as explained by asymmetric information and the related reduction in transaction costs (Smith Jr, 1977). Furthermore, the turnover ratio is used, measured as annual sales to total assets, which represents the management's ability to utilise the firm's assets and generate more earnings. Therefore, under pecking order theory, an increase in the turnover ratio implies higher borrowing capacity for firms. However, Myers (1977) predicts that the turnover ratio (asset utilisation) has a negative association with the debt ratio when firms have an under-investment problem. Other relevant evidence predicts that a firm's risk increases as earnings volatility increases, as does the possibility of bankruptcy. Consequently, lenders will be reluctant to extend credit to such risky firms, and more risk is associated with a lower leverage ratio. To control for volatility, this study uses idiosyncratic risk, measured as the standard deviation of the residuals from the market model.

[31] This study excludes the focal firm from the calculation of the average MSC in each industry to avoid biased estimations.

In addition, a high level of volatility in a firm's returns results in higher expectations of insolvency problems, which adds to the difficulties in paying interest and debt on time. Therefore, it is expected that volatility will result in a negative association with debt under the trade-off and pecking order theories (Antoniou et al., 2008).

Another variable that is associated with capital structure is dividend payments. This variable is controlled using the ratio of dividends to total assets, and it can be negatively associated with the debt ratio according to the transaction cost theory of the dividend and tax hypothesis (Rozeff, 1982). On the other hand, consistent with the clientele effects of dividend policy, Chang and Rhee (1990) report that if the dividend tax rate is greater than the effective capital gains tax rate, firms that pay dividends are likely to use more debt in their capital structure than those with lower dividend payout ratios. Antoniou et al. (2008) show that the relationship between dividend policy and the capital structure of the firm is determined based on the net impact of agency costs, asymmetric information, ownership structure, and other related circumstances. In addition, Antoniou et al. (2008) include firm age based on the firm's incorporation date. Under trade-off theory, as a firm ages, it will be able to prove its performance to the market, which reflects a good reputation perspective, and consequently it will have a high leverage ratio (Diamond, 1989). However, Kieschnick and Moussawi (2018) show that although the age of the firm has a positive association with the use of debt, it has a negative association with how much debt a firm uses. In addition, growth opportunities may impact a firm's capital structure. This study proxies growth using Tobin's Q (Singh et al., 2018).

In relation to the costs of financial distress, trade-off theory predicts a negative relationship between the debt ratio and growth, whereas pecking order theory supports a positive relationship, in which growing firms need more external funds to meet their capital investment requirements (Flannery and Rangan, 2006). Bearing this in mind, governance variables play essential roles in determining firms' capital structure choices (laPorta et al., 1998). Therefore, board size is considered as the natural logarithm of the board members. Board size has a positive influence on capital structure as a monitoring tool over management; however, some researchers argue that larger boards are in fact a waste of resources. Alves et al. (2015) report that the effect of board size on a firm's capital structure varies under different capital structure measures. In addition, the CGC (2010) in the UK asserts that independent directors are crucial in corporate financial decisions. Accordingly, this study uses the board independence percentage, which is the proportion of independent directors on the board. Independent

directors in the UK play an advisory role, which is different from that in the US, where they play a more a disciplinary role (Franks et al., 2001). The study also controls for the percentage of female directors on the board. Davies (2015)[32] calls for more female representation on the board of FTSE firms. Recent research links female representation with more risk-taking and overconfidence (Adams and Ferreira, 2009). According to the asymmetric information argument, female representation on the board also reduces leverage. Consequently, in the case of reduced information asymmetry, firms can consider using external funds (Gul et al., 2011).

Another aspect that is considered in this study is controlling for the size of the audit committee, which is related to better monitoring policy. However, the association of this variable can be either positive (the outcome hypothesis) or negative (the substitution hypothesis) depending on governance quality (Jiraporn et al., 2012). Under the substitution hypothesis, debt and governance work as substitutes for each other and work to reduce agency costs; therefore, firms may seek more debt to control the agency problem when governance is weak. Thus, governance quality and leverage are inversely related. The outcome hypothesis predicts that poor governance is associated with less leverage. Consequently, governance quality and leverage are positively related. Details of all the variables, definitions, names, sources and measurements are provided in Table 3.1.

3.5 Research methodology

The study attempts to control the endogeneity concerns in the estimation model. This is crucial, as when the dynamic model is used, correlation might exist between the lagged dependent variable and the firm fixed effects, which would bias the OLS regression estimators. When dealing with firm fixed effects under fixed-effects models, the problem of correlation between the lagged dependent variable and the transformed error term will still exist. Therefore, even when the explanatory variables are endogenous, such a problem could lead to inconsistent estimations under Ordinary Least Squares regression (OLS) and fixed effects.

However, ignoring the lagged dependent variable when the random-effects or fixed-effects models are estimated may result in a biased estimate (Flannery and Hankins, 2013; Gaud et al., 2005). Therefore, to solve these econometric problems, the system GMM model, proposed by Arellano and Bond (1991) and (Blundell and Bond, 1998), provides appropriate lags of the

[32] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/482059/BIS-15-585-women-on-boards-davies-review-5-year-summary-october-2015.pdf

dependent variable and other explanatory variables to deal with the dynamic nature of capital structure. In addition, system GMM can deal with unobserved time-invariant differences across firms by using first difference transformation.

Flannery and Hankins (2013) compare the OLS, fixed-effects and GMM models, asserting that GMM is superior for estimating capital structure. According to Flannery and Hankins (2013, p.14) '...GMM estimators thus seem well-suited to estimating capital structure models, even in the presence of second-order serial correlation'. Moreover, in the case of unbalanced data, as in this study, Roodman (2009b) shows that it is better to use system GMM and recommends not using difference GMM estimation. In addition, since the study model controls for governance variables, Wintoki et al. (2012) argue that being non-static, system GMM is an appropriate empirical model.

Therefore, following Antoniou et al. (2008) and Wintoki et al. (2012), this study uses system GMM for the dynamic panel to overcome various endogeneity issues, such as simultaneous causality, omitted variables, and dynamic endogeneity. First, such problems occur when certain regressors are endogenous and are thus correlated with the error term. For instance, capital structure decisions can be determined simultaneously with other financial variables, such as the consideration of risky investment decisions. However, since the primary independent variable in this study is MSC, the endogeneity arising from reverse causality is not an issue. It is not logical to postulate a reverse effect moving from capital structure decisions to social capital, as the components of social capital measures predate the measurement of such a variable for years or sometimes decades (Javakhadze et al., 2016b). Second, omitted variables, such as managerial skills and abilities, carry an unobservable heterogeneity that can influence a firm's capital structure. For instance, Antoniou et al. (2008) argue that managerial overconfidence motivates managers to issue additional equity following a rise in the market share price of the company. Finally, the problem of endogeneity that may occur in the study measurement has a dynamic nature (e.g.,Wintoki et al., 2012). This can result from the potential influence of the error term (up to normal shocks that influence the leverage ratio) on the regressors in future periods. For instance, changes in management or governance technology may have an influence on capital structure choices. Consequently, ignoring this issue and the correlation between the regressor and error term (ε) produces misspecifications in the OLS model.

However, the application of system GMM faces two issues. First, the ability of the system to address the endogenous association between the regressor proxies and leverage ratio employing the lagged values of the regressors as instrumental variables results in the problem of too many instruments (Roodman, 2009b). Accordingly, Roodman (2009b) suggests that in such cases, the 'collapse option' reduces the number of instruments and fixes their proliferation. Second, using two-step GMM involves making predictions of the standard error that might be biased. However, this problem can be solved by using the finite-sample correction of the two-step covariance matrix developed by Windmeijer (2005) and using a two-step robust model, which is more efficient than the one-step robust model. Roodman (2009a) illustrates that these fixing procedures result in a two-step robust GMM model with superior estimations to the one-step version. Therefore, this study applies the 'xtabond2' command in the STATA program with a 'collapse' option and robust standard error to avoid system GMM issues. Finally, since the study data are unbalanced, the 'orthogonal' option is also used (Roodman, 2009a).

Following Wintoki et al. (2012), this study implements system GMM, which postulates that all the control variables are endogenous with the exception of firm age and industry and year dummies, which are treated as exogenous variables. The following model is used to examine the relationship between social capital and corporate capital structure decisions:

$$y_{it} = \alpha_{it} + y_{it-1} + y_{it-2} + y_{it-3} + \beta_1 SC_{it} + \beta_2 control_{it} + \theta x_{it} + \mu_i + \varepsilon_{it} \ldots\ldots\ldots\ldots (2.2)$$

where, y_{it} represents the dependent variable, the debt ratio DEBTR of firm i in year t and $y_{it-1} + y_{it-2} + y_{it-3}$ represent the first, second and third lags of the dependent variable of firm i in year t. SC_{it} represents the social capital measure, which is either MSC or adjusted MSC (ADJ-MSC). $control_{it}$ represents the control variables in the model, namely return on assets (ROA), firm size (FSIZE), turnover ratio (TURN), returns volatility (VOL), dividends to assets ratio (DIVTOASS), firm age (FAGE), Tobin's Q (Q), size of the BOD (BSIZE), board independence (NED), and female representation on the BOD (GEN). x_{it} denotes the vector of exogenous variables (e.g. firm age, and year and industry dummies), μ_i represents time-invariant unobservable firm-specific effects (e.g. management reputation, performance, and capital intensity), and ε_{it} stands for the error term, or the residuals.

Table 3.1. Variables: definitions and sources

Variable	Notation	Source	Variable description	Previous studies/Code(s)
				Dependent variable
Debt ratio	DEBTR	Author's calculation	Short-term debt plus long-term debt divided by the book value of total assets *(winsorised)*	Huang and Shang (2019)/WC03251; WC03051; WC02999
Market debt ratio	MDEBTR	Author's calculation	Short-term debt plus long-term debt divided by market capitalisation *(one-year lagged and winsorised)*	Ferris et al. (2018)/WC03251; WC03051; P; NOSH
				Main independent variables
Managerial social capital	MSC	Author's calculation	Firm aggregate connections for each board member from current employment, previous employment, education, and social activity	Fracassi and Tate (2012); Ferris et al. (2017b); own calculation
Adjusted managerial social capital	ADJ-MSC	Author's calculation	MSC adjusted to the industry average without the focal firm	Created in this study
				Control variables
Return on assets	ROA	DataStream	Ratio of net income to total assets *(winsorised)*	Homroy and Slechten (2019)/ WC18191; WC02999
Firm size	FSIZE	DataStream	Ln (total assets) *(winsorised)*	Huang and Shang (2019)/WC02999
Turnover ratio	TURN	DataStream	Asset turnover measured as the ratio of annual sales to total assets *(winsorised)*	Singh and Davidson III (2003)/ WC01001; WC02999
Volatility	VOL	Author's calculation	Return volatility measured for each stock by the standard deviation of daily returns in each year *(winsorised)*	Hasan and Habib (2019a); own calculations
Dividends to assets	DIVTOASS	DataStream	Total dividends (common and preferred) to total assets *(winsorised)*	Davaadorj (2019)/WC04551; WC02999
Tobin's Q ratio	Q	DataStream	Number of shares outstanding times stock price plus total liabilities divided by total assets *(winsorised)*	Singh et al. (2018)/NOSH; P; WC03251; WC03051; WC02999
Turnover ratio	TURN	DataStream	Asset turnover measured as the ratio of annual sales to total assets *(winsorised)*	Singh and Davidson III (2003)/ WC01001; WC02999
Firm age	FAGE	DataStream/ gov.uk	Natural logarithm of the number of years since the incorporation of the firm *(one-year lagged and winsorised)*	Akbar et al. (2017)/WC18273
Board size	BSIZE	BoardEx	Total number of directors sitting on the board *(winsorised)*	Fracassi (2017)
Board independence	NED	BoardEx	Ratio of the number of independent directors to the number of all directors *(winsorised)*	Akbar et al. (2017)
Audit committee size	ASIZE	BoardEx	Total number of directors sitting on the audit committee *(winsorised)*	Elmagrhi et al. (2017)
Female directors	GEN	BoardEx	Ratio of the number of female directors to the total number of directors *(winsorised)*	Chen et al. (2017b)
Industry dummy	SIC	Bloomberg	Dummy for each micro-sector	Phillips and Ormsby (2016)
Year dummy	YEAR		Dummy variable for each year	

				Variables used to evaluate asymmetric information
Bid price	BID	DataStream	Highest price for a stock on a particular day that the market maker (i.e. dealer) is willing to pay	Tuugi et al. (2014)
Ask price	ASK	DataStream	Lowest price for a stock on a particular day that the market maker (i.e. dealer) is willing to pay	Tuugi et al. (2014)
Bid–ask spread	BDASSPD	Author's calculation	Average closing stock bid-ask spread over the 253 days expressed as [(PA − PB) / (PA + PB) / 2)] * 100,000	Tuugi et al. (2014)

3.6 Results and discussion

Table 3.2 presents the study variable statistics of the 332 firms that appear at least once on the FTSE 350 Index from 2006 to 2017. The dependent variable is book leverage (DEBT_B), and after further analysis, market leverage (BDEBT_M) is used. The average book leverage ratio is 0.18, and the market leverage ratio is 0.21. The mean and standard deviation of MSC are around 5 and 2.276, respectively, whereas the corresponding figures for ADJ-MSC are 0.424 and 2.48, respectively. For MSC, the mean value implies that firms in the UK have around five connections from all the proxies that contribute to MSC value.

In addition, the control variables have the following average/standard deviation values: return on assets (0.05/0.11); firm size (13.64/1.88); Tobin's Q (1.14/0.81); turnover ratio (0.78/0.79); volatility (0.29/0.18); dividends to assets (0.025/0.026); and firm age (3.56/0.79). Moreover, as the study includes governance variables, the mean value of board size is 2, the audit committee size is 1.40, the proportion of non-executive directors on boards is 0.71, and average female participation on the board is 0.13. These results are similar to those of recently published studies in the UK that investigate similar variables (Homroy and Slechten, 2019; Akbar et al., 2017; Antoniou et al., 2008).

Table 3.3 shows the correlation matrix across all the study variables and demonstrates that the correlations between some variables are significant. Gujarati (2003) notes that high collinearity between estimated variables may cause inconsistent results. Specifically, he refers to the collinearity problem in the case of correlation values of 0.80 or higher between two variables. Moreover, the table shows the variance inflation factor (VIF), which is used to assess multicollinearity across all the independent variables, as well as the reciprocal of VIF (1/VIF), known as the tolerance factor. As a rule of thumb, a VIF value of more than 10 is considered to have the multicollinearity problem. However, the table shows that none of the correlation values across the variables is higher than 0.80. The highest VIF value is 4.605, and the lowest tolerance (1/VIF) value is 0.217. Therefore, potential collinearity problems have no significant influence on the estimations result of this study.

Table 3.2. Summary statistics. Descriptive statistics of the study variables used in the multivariate analysis of the study. Dataset observations are based on the FTSE 350 during the period 2006−2018.

	Variable	N	Mean	SD	Percentile					Skewness	Kurtosis
					P25	P50	P75	Max	Min		
1	DEBT_B	4115	0.187	0.165	0.050	0.157	0.280	0.72	0	0.971	3.588
2	MSC	4241	5.040	2.276	3.951	5.308	6.561	11.790	0	-0.607	3.337
3	ADJ-MSC	4241	0.424	2.480	-0.944	0.552	2.014	6.877	-5.641	-0.360	3.200
4	ROA	4115	0.048	0.105	0.013	0.05	0.095	0.300	-0.428	-1.479	8.827
5	FSIZE	4115	13.639	1.879	12.339	13.295	14.577	20.512	10.599	1.157	4.781
6	Q	4109	1.144	0.811	0.731	0.907	1.328	4.976	0.075	2.274	9.644
7	TURN	4101	0.782	0.787	0.1	0.6	1.170	3.530	-0.070	1.243	4.260
8	VOLA	4102	0.289	0.176	0.179	0.248	0.341	2.486	0.045	2.920	19.397
9	DIVTA	4089	0.025	0.026	0.008	0.019	0.033	0.141	0	1.994	7.931
10	FAGE	4216	3.561	0.786	2.944	3.434	4.331	4.852	1.792	-0.003	1.943
11	BSIZE	3941	2.023	0.318	1.792	2.079	2.197	2.773	1.386	0.107	2.444
12	ASIZE	4001	1.402	0.338	1.099	1.386	1.609	2.197	0	-0.821	5.659
13	NED	3203	0.706	0.321	0.5	0.636	0.857	1.800	0.200	1.087	4.293
14	GEN	3941	0.130	0.121	0	0.130	0.200	0.500	0	0.679	2.952
15	DEBT_M	4110	0.207	0.202	0.052	0.154	0.294	0.902	0	1.346	4.587
16	Bdask	4139	0.011061	0.014167	0.001562	0.004715	0.016154	0.07316	0.000298	2.124823	8.055931

Table 3.3. Pearson's correlations and VIF values. The table shows the correlation matrix between the study variables. See Table 3.2 for variable definitions and measurements.

	Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	VIF	1/VIF
(1)	DEBT_M	1.000														4.605	0.217
(2)	DEBT_B	0.766	1.000													3.362	0.297
(3)	MSC	0.110	0.100	1.000												1.084	0.922
(4)	ROA	-0.298	-0.124	-0.056	1.000											1.402	0.713
(5)	FSIZE	0.376	0.272	0.097	-0.023	1.000										1.855	0.539
(6)	TURN	-0.136	-0.044	0.035	0.081	-0.195	1.000									1.294	0.773
(7)	VOLA	0.313	0.129	0.101	-0.384	-0.184	0.210	1.000								1.619	0.618
(8)	DIVTA	-0.262	-0.004	-0.062	0.382	-0.064	0.353	-0.118	1.000							1.700	0.588
(9)	FAGE	0.051	0.049	-0.003	0.048	0.076	0.029	-0.105	0.017	1.000						1.057	0.946
(10)	Q	-0.348	0.014	-0.052	0.308	-0.196	0.247	-0.067	0.540	-0.095	1.000					1.860	0.538
(11)	BSIZE	0.014	0.008	0.051	-0.048	-0.023	0.057	0.051	-0.025	-0.023	-0.009	1.000				2.076	0.482
(12)	ASIZE	-0.077	-0.025	-0.064	0.048	-0.078	-0.035	-0.053	0.020	0.038	0.036	0.209	1.000			1.138	0.879
(13)	NED	0.146	0.129	-0.031	0.034	0.454	-0.134	-0.161	0.030	0.004	-0.043	-0.635	-0.117	1.000		2.547	0.393
(14)	GEN	-0.004	0.045	-0.198	0.042	0.069	-0.068	-0.072	0.040	0.099	0.052	0.063	0.250	0.020	1.000	1.141	0.876

Table 3.4. The mean, difference, Δ difference and standard deviation for MSC, ADJ-MSC, DEBT_B, and DEBT_M in the UK between 2006 and 2017.

Notes:

Mean is the mean value of the variable each year.

Difference is the change between mean values from year(t) to year(t−1).

Δ difference is the percentage change of the mean value of each variable from year(t−1) to year(t), i.e. [(mean X_t – mean X_{t-1}) / mean (X_{t-1})].

Standard deviation is the dispersion of the mean values.

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
MSC	5.822	5.634	5.674	5.628	5.593	5.506	5.397	5.148	4.930	4.511	3.882	2.787
	-	-0.188	0.040	-0.046	-0.035	-0.087	-0.109	-0.249	-0.218	-0.419	-0.629	-1.095
		-0.032	0.007	-0.008	-0.006	-0.016	-0.020	-0.046	-0.042	-0.085	-0.139	-0.282
	(1.785)	(1.757)	(1.744)	(1.841)	(1.907)	(2.024)	(2.128)	(2.282)	(2.336)	(2.366)	(2.438)	(2.445)
ADJ-MSC	1.209	1.020	1.059	1.013	0.978	0.891	0.782	0.533	0.312	-0.108	-0.737	-1.831
	-	-0.189	0.039	-0.046	-0.035	-0.087	-0.109	-0.249	-0.221	-0.420	-0.629	-1.094
		-0.156	0.038	-0.043	-0.035	-0.089	-0.122	-0.318	-0.415	-1.346	5.824	1.484
	(2.045)	(2.034)	(2.028)	(2.110)	(2.171)	(2.278)	(2.318)	(2.475)	(2.529)	(2.547)	(2.609)	(2.606)
DEBT_B	0.190	0.197	0.214	0.210	0.186	0.179	0.179	0.175	0.173	0.184	0.179	0.175
	-	0.007	0.017	-0.004	-0.024	-0.007	0.000	-0.004	-0.002	0.011	-0.005	-0.004
		0.037	0.086	-0.019	-0.114	-0.038	0.000	-0.022	-0.011	0.064	-0.027	-0.022
	(0.163)	(0.168)	(0.177)	(0.180)	(0.164)	(0.161)	(0.166)	(0.162)	(0.152)	(0.157)	(0.162)	(0.160)
DEBT_M	0.173	0.188	0.286	0.270	0.220	0.220	0.207	0.179	0.175	0.191	0.189	0.182
	-	0.015	0.098	-0.016	-0.050	0.000	-0.013	-0.028	-0.004	0.016	-0.002	-0.007
		0.087	0.521	-0.056	-0.185	0.000	-0.059	-0.135	-0.022	0.091	-0.010	-0.037
	(0.162)	(0.178)	(0.248)	(0.241)	(0.206)	(0.215)	(0.205)	(0.182)	(0.173)	(0.187)	(0.186)	(0.186)

Table 3.4 presents the evolution of UK[33] social capital and capital structure during the 12-year sample period (2006–2017). Notably, MSC shows a declining trend, which tends to be more pronounced after 2013. The trend might be explained by the CGC issued in 2010, which recommends that 50% of the board of FTSE 350 firms should comprise independent directors. The ADJ-MSC measure shows a similar trend.

In addition, capital structure displays a declining trend, as measured by the book and market debt ratios. This shows a particularly sharp decline in the debt measure after 2009, which is consistent with the finding of Iqbal and Kume (2014). As shown in Table 3.4, the difference is −0.024 and the Δ difference 0.114. These descriptive results reflect more conservative behaviour in the use of debt by the UK firms.

3.6.1 MSC and capital structure

Table 3.5 presents the baseline regressions of this chapter. The regressions in Table 3.5 are based on using two dependent variables: the book leverage (Model-I, Model-II, Model-III and Model-IV) and market leverage (Model-V, Model-VI, Model-VII and Model-VIII). All regressions are based on the GMM estimation. As shown in Table 3.5, Model-I and Model-V are based on the whole sample of firms by excluding the industry effect, whereas Model-II and Model-VI use the whole sample of firms by including the industry effect. Moreover, this chapter separates the whole sample of firms into financial and non-financial firms. Accordingly, Model-III and Model-VII represent the outcomes of both regressions (book and market) based on the non-financial firms, whereas Model-IV and Model-VIII are based on using the financial firms. The results in Table 3.5 are discussed below.

For the all models in the Table 3.5 except Model-IV and Model-VIII, the relationship between social capital and capital structure is positive. Accordingly, hypothesis H_1, which concerns the positive relationship between MSC and capital structure, is accepted. However, the main result of this chapter is based on the models of the whole sample of firms (Model-II and Model-VI). Accordingly, this evidence supports DeAngelo and Roll (2015) view of the role of social norms in determining capital structure. Moreover, Model-I and Model-V report results without industry effects, whereas Model-II and Model-VI include these. Overall, the results are robust to the variations across industries. They are also economically relevant; for example, as shown in Model-II and Model-VI, the figures indicate that a 100% increase in social capital is

[33] Shahgholian et al. (2012) provide some discussions regarding the evolution of the social network in the UK using the current employment dimension for the period 2000–2011.

associated with an increase of 0.65% (t = 2.840) in book leverage, whereas a similar increase in social capital is associated with an increase of 0.93% (t = 2.998) in market leverage.

Hypothesis H_1 predicts a positive association between MSC and capital structure. Consequently, the results are consistent with pecking order theory, which predicts high information asymmetry between managers and investors, leading firms to choose internally generated funds instead of external ones (Myers and Majluf, 1984). Therefore, as argued previously, MSC alleviates the information asymmetry problem and allows managers to use external funds more frequently with lower transaction costs. Moreover, this aligns with the signalling model, in which managers attempt to act in favour of old shareholders; therefore, issuing new equity sends a negative signal, meaning that the use of debt is preferable to issuing new equities for socially connected firms (Myers and Majluf, 1984).

The results showing a positive relationship between capital structure and MSC are different from those reported by (Huang and Shang, 2019), who found that the relationship was negative in the US. This difference could be due to the methodological perspective, as discussed previously, in that the use of the system GMM model results in an unbiased estimation. Therefore, the estimations of this study are consistent with the previous capital structure methodological approach recommended by (Flannery and Hankins, 2013; Antoniou et al., 2008).

In addition, the positive relationship between capital structure and social capital is explained by the outcome model, in which weak governance quality is associated with the use of less leverage financing (Jiraporn et al., 2012; La Porta et al., 2000). Therefore, this study indicates that MSC is a governance mechanism which helps to improve firm performance through its monitoring and control, together with its ability to reduce the asymmetric information between managers and shareholders. Consequently, MSC can alleviate the agency problem by assuming this governance role. Accordingly, the outcome model indicates that a poor governance mechanism results in less reliance on debt financing. Consequently, MSC and corporate governance perform the same function through the institutional influence of social capital.

Table 3.5. Relationship between managerial social capital and capital structure. This table presents the results of the dynamic panel generalised method of moments estimators using book leverage and market leverage as proxies of capital structure and MSC as a proxy of social capital. All the models include year dummies. Year dummy, firm age and industry dummy are treated as exogenous variables. Three lags of the dependent variable were used in each model. *t*-statistics based on robust standard errors are shown in parentheses. The null hypothesis for the Hansen test of overidentification is that all instruments are exogenous. AR(1) and AR(2) are test statistics for the null hypothesis that there is no serial correlation of orders 1 and 2 in the first-difference residuals. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively. The study used GMM options that include collapse, orthogonal, small, and robust options. More details of the definitions and construction of the variables are provided in Table 3.2.

	Book leverage				Market leverage			
	Model-I	Model-II	Model-III	Model-IV	Model-V	Model-VI	Model-VII	Model-VII
	All_no-ind	All_ind	Non-fin	Fin	All_no-ind	All_ind	Non-fin	Fin
MSC	0.00588***	0.00653***	0.00516***	0.000841	0.00846***	0.00931***	0.00794***	0.00183
	(2.664)	(2.84)	(2.693)	(0.412)	(2.743)	(2.998)	(2.978)	(0.564)
ROA	-0.153***	-0.145***	-0.122*	-0.129***	-0.178***	-0.173***	-0.125*	-0.171**
	(-3.061)	(-2.856)	(-1.746)	(-3.045)	(-3.571)	(-3.402)	(-1.740)	(-2.485)
FSIZE	-0.00640*	-0.00785**	0.00712	0.00132	0.0104	0.00953	0.0253***	0.00854
	(-1.815)	(-2.304)	-1.277	-0.351	-0.974	-0.872	-3.431	-1.086
TURN	-0.0363***	-0.0379***	-0.0225***	-0.0233***	-0.0497***	-0.0544***	-0.0305***	-0.0292*
	(-3.309)	(-3.453)	(-2.639)	(-2.651)	(-3.443)	(-3.399)	(-2.672)	(-1.979)
VOL	0.123***	0.122***	0.0845***	0.00761	0.227***	0.239***	0.225***	0.160*
	(3.923)	(3.936)	(2.889)	(0.220)	(3.952)	(4.177)	(4.207)	(1.848)
DIVTOASS	1.173***	1.250***	0.863***	0.388*	1.810***	1.999***	0.439	1.332***
	(2.779)	(3.007)	(3.084)	(1.737)	(2.972)	(3.347)	(1.341)	(2.678)
FAGE	0.00628*	0.00467	-0.00271	0.00915*	0.00639	0.00786	0.00217	0.00638
	(1.657)	(1.243)	(-0.531)	(1.853)	(0.994)	(1.187)	(0.319)	(0.695)
Q	-0.0103	-0.0129	-0.0116	0.0269***	-0.0454***	-0.0481***	-0.0330***	-0.0440***
	(-1.186)	(-1.548)	(-1.585)	(2.858)	(-4.167)	(-4.201)	(-3.549)	(-3.905)
BSIZE	0.0876**	0.0923**	0.00284	0.0265	0.110	0.124*	-0.0701	0.0836
	(2.006)	(2.129)	(0.091)	(1.028)	(1.374)	(1.653)	(-1.445)	(1.64)
ASIZE	-0.0483***	-0.0455***	0.0185	-0.0017	-0.0305	-0.0284	-0.0174	-0.00119
	(-2.861)	(-2.792)	-0.628	(-0.0662)	(-1.149)	(-1.036)	(-0.663)	(-0.0480)
NED	0.0758**	0.0772**	0.00619	0.00828	0.103*	0.110*	-0.06	0.0810*
	(2.071)	(2.198)	(0.197)	(0.279)	(1.719)	(1.831)	(-1.320)	(1.776)
GEN	0.00512	0.00918	0.0920**	-0.0337	0.0413	0.0522	0.139**	-0.0283
	(0.092)	(0.177)	(2.450)	(-0.660)	(0.545)	(0.712)	(2.114)	(-0.405)
$Dep.var_{t-1}$	0.652***	0.663***	0.882***	0.844***	0.436***	0.436***	0.608***	0.493***
	(7.834)	(8.134)	(16.340)	(14.470)	(4.849)	(5.077)	(12.460)	(4.725)
$Dep.var_{t-2}$	0.115	0.128	0.0265	-0.0891	0.00327	0.0227	-0.00737	0.012
	(0.909)	(0.989)	(0.354)	(-1.273)	(0.0319)	(0.224)	(-0.173)	(0.127)
$Dep.var_{t-3}$	0.0409	0.0364	-0.0804	0.128***	0.163***	0.159***	0.0874***	0.135***
	(0.269)	(0.24)	(-0.998)	(3.533)	(3.367)	(3.334)	(2.688)	(2.629)
Constant	-0.0932	-0.135	-0.159	-0.112**	-0.385**	-0.468***	-0.153	-0.302**
	(-0.761)	(-0.983)	(-1.602)	(-1.990)	(-2.510)	(-2.739)	(-1.162)	(-2.312)
Observations	2240	2239	1407	833	2239	2239	1407	833
Number of firms	316	316	200	116	316	316	200	116
F-statistic	34.12***	28.02***	58.83***	51.62***	26.69***	21.79***	34.73***	16.50***
AR(1)	0.029	0.03	0.068	0	0.018	0.017	0	0.110
AR(2)	0.555	0.575	0.320	0.899	0.595	0.509	0.720	0.110
Hansen test	0.396	0.375	0.481	0.501	0.163	0.143	0.163	0.924
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	No	Yes	Yes	Yes	No	Yes	Yes	Yes

In addition, Table 3.5 presents the outcomes of using the financial firms and non-financial firms separately. Accordingly, hypothesis H_2 is rejected, and this result indicates that the relationship between social capital and capital structure changes under using the financial and non-financial firms separately. Consequently, the reported figures in Model-III and Model-VII show that MSC has a positive and significant effect on social capital under the use of non-financial firms. These results are significant at 1%, but it is worth paying some attention to the coefficients and the significance levels between the models of the whole sample of firms and the models of the non-financial firms. To explain this, for book leverage regressions, in Model-II, a 100% increase in social capital is associated with an increase of 0.65% (t = 2.840), whereas in Model-III, a 100% increase in social capital is associated with an increase of 0.51% (t = 2.690). On the other hand, for market leverage regressions, in Model-VI, a 100% increase in social capital is associated with an increase of 0.93% (t =3.00), whereas in Model-VII, a 100% increase in social capital is associated with an increase of 0.79% (t = 2.980). Accordingly, these results indicate that when using the whole sample of firms or non-financial firms, MSC has the same positive effect on the capital structure decision of the firm, but this effect is larger and more significant under the use of the whole sample of firms.

Another key point is that for Model-IV and Model-VIII, the regressions are based on the financial firms only. Despite the positive coefficient, there is no significant effect of MSC on the capital structure of the firm. This also indicates the rejection of hypothesis H_2, but referring to the whole sample of firms (Model-II and Model-VI) that incorporates the financial and non-financial firms, the significance levels and coefficients are higher than for the non-financial firms sample (Models-III and Model-VII). Accordingly, the relationship between MSC and capital structure is not significant under Model-IV and Model-VIII, but it can play a role in social networks. Therefore, a further investigation is needed to determine the role of MSC under the financial firms; however, that might be related to other specific factors which are outside the scope of this study.

However, as mentioned earlier, the main result of this study is based on the whole sample of firms. Accordingly, Table 3.5 shows that for Model-I, Model-II, Model-V and Model-VI, ROA (as a measure of firms' profitability) has a negative and significant influence on firms' capital structure. These results support the predictions of pecking order theory (Antoniou et al., 2008). This implies that UK firms review their investment strategy and rely more on internally generated funds.

Regarding firm size, large firms are expected to have lower transaction costs when raising new funds since they have fewer information asymmetry problems (Smith Jr, 1977). In addition, Antoniou et al. (2008) argue that large firms face lower bankruptcy costs. However, firm size has a negative and significant effect on the book leverage ratio but an insignificant effect on market leverage.

The sales turnover ratio has a negative and significant influence on the leverage ratio. This negative influence can be explained by the fact that UK firms may have an underinvestment problem (Myers, 1977). Risk, as measured by volatility ratio, has a positive and significant effect on the book and market leverage measures, which is consistent with the trade-off and pecking order theories. Similar results are reported by (Antoniou et al., 2008).

In addition, the study estimations show a positive and significant relationship between dividends and leverage. This implies that UK firms commit to pay dividends to their shareholders, even if there is an increasing leverage ratio, and especially as the payment of dividends is not obligatory under the UK's companies Act 2006. These results are consistent with the signalling and agency cost theories (Antoniou et al., 2008). With respect to the age of the firm, firms that have been in the market for longer are expected to have built a good reputation and face fewer information asymmetry-related problems; this is consistent with trade-off theory, which predicts a positive association between a firm's age and its leverage ratio. However, this study shows that there is no significant relationship between these two factors apart from a moderate positive effect in Model-I and Model-IV. Considering the firms' Tobin's Q**,** the relationship is negative and significant in relation to market leverage but has an insignificant effect in relation to the book leverage ratio, except for Model-IV, which represents financial firms, for which the relationship is positive and significant. However, the negative relationship is explained by trade-off theory, and the results are consistent with those of Goyal et al. (2002), who found that defence firms increased their use of debt in their structure when growth opportunities declined.

The other control variables considered are related to governance proxies. Generally, it has been argued that governance quality is related to better performance and minimisation of agency costs (Porta et al., 1998). For the board size variable, the study estimation reports a positive and moderate effect of board size on leverage. This effect is stronger for book leverage than market leverage. These results can be explained by information asymmetry, as a larger board can reduce asymmetric information through disclosure (Cheng and Courtenay, 2006), which

leads to more use of debt in the capital structure of the firm. Independent directors play a similar role to that of board size, as evidenced by their positive and moderately significant effect on capital structure. The advisory role played by independent directors supports the board function and alleviates information asymmetry between management and shareholders, implying that they help in reducing agency costs, which allows firms to use more debt financing (Alves and Francisco, 2015). On the other hand, the audit committee variable has a negative and moderate effect on book leverage and no effect on the market leverage measure. This negative effect supports the substitution hypothesis and reflects good governance quality (i.e. low agency costs). Therefore, all things being equal, firms that have poor governance need to issue more debt to reflect a good governance structure and to build a good reputation in the market, which enable them to raise capital from external funds on fair terms. Finally, the gender variable has no effect on leverage, which is consistent with the finding of Detthamrong et al. (2017), who report that the percentage of females on the board does not affect the leverage of a firm, and with that of Sila et al. (2016), who also found that there was no association between the two factors. However, the gender variable has a moderate positive effect on the capital structure under employing the non-financial sample, which is consistent with the findings of (García and Herrero, 2021; Faccio et al., 2016).

According to Table 3.5, the test specifications confirm that the use of system GMM is valid, as it presents the robustness of the model estimators. In this regard, Flannery and Hankins (2013) argue that serial correlation might exist in first-order serial correlation AR(1) and even in second-order AR(2). Under these specifications, the study results have no serial correlation in the second-order difference of AR(2). Furthermore, the Hansen test of overidentification is insignificant, which implies that the instruments used in the study are valid.

3.6.2 Adjusted measure of MSC and capital structure

In addition to the MSC index measure, the study uses an adjusted measure of MSC that accounts for the fact that the MSC value of each firm has been subtracted from the average MSC value for that industry, excluding the focal firm, to obtain an unbiased/adjusted measure. Accordingly, as shown in Table 3.6, the ADJ-MSC variable is considered in relation to the two capital structure measures reported in Models IX, X, XI, XII, XIII, XIV, XV and XVI. The results here are consistent with those reported in Table 3.5, implying that they are robust to alternative MSC specifications and not derived from an industry effect. They also provide further support for the prediction of hypothesis H_1. More specifically, the effect of ADJ-MSC on capital structure is 0.64% (t = 2.798) and 0.91% (t = 2.624) in Models VI and VII,

respectively. This is similar to the MSC effect reported in Table 3.5. In addition, the results lead us to reject hypothesis H_2, and that is consistent with the reported results in Table 3.5. Accordingly, there is a difference between the financial and non-financial firms under the relationship between social capital and capital structure.

Overall, the results support the notion that firms' leverage is influenced by social capital. Moreover, they add to the findings of previous studies in corporate finance by providing new evidence of the role of the socio-economic variable, as measured by social capital, in determining firms' financial policy, especially capital structure.

Table 3.6. Relationship between managerial social capital and capital structure, using adjusted managerial social capital (Adj-MSC). This table presents the results of the dynamic panel generalised method of moments estimators using book leverage and market leverage as proxies of capital structure and ADJ-MSC as a proxy of social capital. The table displays two-step dynamic panel system GMM estimations of managerial social capital on the capital structure and control variables. All the models include year dummy variables. Year dummy, firm age and industry dummy are treated as exogenous variables. The study incorporates three lags of the dependent variable in each model. t-statistics based on robust standard errors are shown in parentheses The null hypothesis for the Hansen test of overidentification is that all instruments are exogenous. AR (1) and AR (2) are test statistics for the null hypothesis that there is no serial correlation of orders 1 and 2 in the first-difference residuals. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively. The study used GMM options that includes collapse, orthogonal, small and robust options. More details of the variable definitions and construction are provided in Table 3.1.

	Book leverage				Market leverage			
	Model-IX	Model-X	Model-XI	Model-XII	Model-XIII	Model-XIV	Model-XV	Model-XVI
	All_no-ind	All_ind	Non-fin	Fin	All_no-ind	All_ind	Non-fin	Fin
ADJ-MSC	0.00584***	0.00642***	0.00519***	0.000814	0.00940***	0.00914***	0.00834***	0.00161
	(2.786)	(2.798)	(2.804)	(0.489)	(2.964)	(2.624)	(3.183)	(0.498)
ROA	-0.142***	-0.145***	-0.136*	-0.138***	-0.174***	-0.150***	-0.131*	-0.165**
	(-3.189)	(-2.854)	(-1.775)	(-3.014)	(-3.390)	(-2.817)	(-1.936)	(-2.377)
FSIZE	0.00207	-0.00790**	0.00635	0.00143	0.00963	0.00757	0.0248***	0.00773
	(0.289)	(-2.319)	(1.225)	(0.504)	(0.883)	(0.802)	(3.453)	(1.013)
TURN	-0.0331***	-0.0378***	-0.0238***	-0.0239***	-0.0552***	-0.0506***	-0.0305***	-0.0281*
	(-3.125)	(-3.423)	(-2.755)	(-2.944)	(-3.458)	(-3.332)	(-2.700)	(-1.967)
VOL	0.132***	0.122***	0.0815***	0.0133	0.235***	0.324***	0.220***	0.162**
	(3.574)	(3.922)	(2.883)	(0.423)	(4.069)	(4.998)	(4.077)	(2.010)
DIVTOASS	1.280***	1.249***	0.880***	0.362	1.992***	2.350***	0.430	1.389**
	(3.288)	(2.998)	(3.498)	(1.247)	(3.319)	(3.525)	(1.264)	(2.608)
FAGE	0.00396	0.00461	-0.00281	0.00818*	0.00764	0.00434	0.00238	0.00581
	(1.004)	(1.226)	(-0.511)	(1.702)	(1.16)	(0.675)	(0.336)	(0.672)
Q	-0.0143*	-0.013	-0.0113	0.0277***	-0.0482***	-0.0588***	-0.0321***	-0.0457***
	(-1.811)	(-1.550)	(-1.593)	(3.079)	(-4.208)	(-5.186)	(-3.337)	(-3.840)
BSIZE	0.0278	0.0920**	0.000776	0.0229	0.123*	0.125**	-0.0690	0.0864*
	(0.654)	-2.115	(0.0258)	(0.957)	(1.661)	(1.995)	(-1.444)	(1.683)
ASIZE	-0.0419**	-0.0453***	0.0152	0.00234	-0.0275	-0.0594**	-0.0238	-0.00398
	(-2.438)	(-2.777)	(0.544)	(0.0958)	(-1.003)	(-2.118)	(-0.930)	(-0.151)
NED	0.0242	0.0767**	0.00419	0.00863	0.108*	0.139**	-0.0535	0.0834*
	(0.573)	(2.179)	(0.135)	(0.373)	(1.799)	(2.197)	(-1.148)	(1.947)
GEN	0.0464	0.00854	0.0941**	-0.0275	0.0535	0.0149	0.150**	-0.0446
	(0.982)	(0.165)	(2.492)	(-0.556)	(0.728)	(0.167)	(2.399)	(-0.557)
Dep.vart-1	0.734***	0.664***	0.885***	0.832***	0.442***	0.312***	0.604***	0.500***
	(7.761)	(8.144)	(16.280)	(15.510)	(5.092)	(3.489)	(13.220)	(5.029)
Dep.vart-2	0.0527	0.129	0.0185	-0.0710	0.0203	0.0639	-0.00523	0.00867
	(0.423)	(0.997)	(0.238)	(-1.071)	(0.198)	(0.623)	(-0.125)	(0.0962)
Dep.vart-3	-0.0172	0.0353	-0.0782	0.126***	0.158***	0.193**	0.0901***	0.134**
	(-0.136)	(0.234)	(-0.930)	(3.698)	(3.294)	(2.534)	(2.916)	(2.616)
Constant	-0.0322	-0.0979	-0.108	-0.0981	-0.413**	-0.320**	-0.111	-0.298**
	(-0.265)	(-0.723)	(-1.236)	(-1.536)	(-2.409)	(-2.106)	(-0.858)	(-2.200)
Observations	2240	2239	1,407	833	2239	2240	1,407	833
Number of firms	316	316	200	116	316	316	200	116
F-statistic	21.68***	27.97***	60.36***	42.71***	21.72***	23.65***	35.72***	15.27***
AR1	0.013	0.030	0.067	0	0.017	0.027	0	0.109
AR2	0.488	0.577	0.315	0.797	0.521	0.470	0.715	0.107
Hansen test	0.450	0.368	0.506	0.412	0.152	0.300	0.207	0.921
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	No	Yes	Yes	Yes	No	Yes	Yes	Yes

3.6.3 Further analysis

Managerial social capital and asymmetric information

Despite the increasing calls for more information disclosure by UK firms, for example, from the Financial Reporting Council, the problem of information asymmetry between management and investors still exists (Siougle et al., 2014). However, as discussed in the literature review, MSC possesses an attribute that works as a mechanism to alleviate the information asymmetry which can occur from embedded trust in social capital, which enhances shareholder confidence and the ability of MSC to transfer information. Therefore, it is predicted that firms with higher MSC could reduce their asymmetric information. Consequently, agency conflict could also be reduced through MSC. These predictions are consistent with the positive relationship between leverage and social capital.

Previous studies have used alternative measures to proxy information asymmetry. As suggested by Clarke and Shastri (2000), these measures can be classified into three categories: growth opportunities, analyst forecasts, and market microstructure. However, Leuz and Verrecchia (2000) use the bid–ask spread, stock turnover and stock volatility to proxy information asymmetry and argue that the bid–ask spread is the most appropriate measure. A number of other studies also support the use of the bid–ask spread to proxy information asymmetry (Tuugi et al., 2014; Coller and Yohn, 1997). Accordingly, this study follows the previous studies in proxying information asymmetry by using the bid–ask spread. Generally, the lower the bid–ask spread, the lower the level of information asymmetry, and vice versa.

Table 3.7 shows that both MSC and ADJ-MSC, as reported in Model-XVII and Model-XVIII, respectively, are negatively related to firms' information asymmetry.[34] This is consistent with hypothesis H_3, which predicts that social capital negatively impacts the level of information asymmetry. Accordingly, further support is provided for the predictions of the main hypothesis H_1. Therefore, it is argued that higher levels of social capital reduce the level of information asymmetry, which is consistent with the predictions

[34] For the purpose of the analysis in Table (3.7), this study uses log of sales to proxy firm size (FSIZE_S) to avoid collinearity between bid-ask spread and FSIZE (Tuugi et al. 2014).

Table 3.7. Relationship between managerial social capital and asymmetric information. The table reports two-step dynamic panel system GMM estimations of managerial social capital on the bid ask–and control variables. All models include the year dummy variables. Year dummy, firm age, and industry dummy are treated as exogenous variables. The study incorporates three lags of the dependent variable in each model. t-statistics based on robust standard errors are shown in parentheses. The null hypothesis for the Hansen test of overidentification is that all instruments are exogenous. Year and industry fixed effects are employed. AR (1) and AR (2) are test statistics for the null hypothesis that there is no serial correlation of orders 1 and 2 in the first-difference residuals. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively. This study used GMM options that include the collapse, orthogonal, small and robust options. More details of the definitions and construction of the variables are provided in Table 3.2.

	Model-XVII	Model-XVIII
MSC	-0.219***	
	(-3.739)	
ADJ-MSC		-0.212***
		(-3.746)
ROA	-5.973**	-6.006**
	(-2.445)	(-2.550)
FSIZE_S[1]	0.00535	0.0171
	-0.0547	-0.169
TURN	-0.450**	-0.466**
	(-2.168)	(-2.252)
VOL	4.031**	4.076**
	-2.512	-2.447
DIVTOASS	15.09*	16.33*
	-1.821	-1.955
FAGE	0.223**	0.222*
	-2.252	-1.95
Q	-0.310	-0.331*
	(-1.621)	(-1.663)
BSIZE	-0.582	-0.599
	(-0.929)	(-0.903)
ASIZE	-0.402	-0.305
	(-0.607)	(-0.469)
NED	-1.630***	-1.667***
	(-2.969)	(-3.083)
GEN	-0.951	-1.121
	(-0.726)	(-0.837)
Dep.vart-1	0.799***	0.792***
	-12.57	-12.02
Dep.vart-2	-0.0263	-0.018
	(-0.452)	(-0.303)
Constant	3.678	2.197
	-1.526	-0.894
Observations	2,259	2,259
Number of boardid	314	314
F-statistic	157.72***	155.9***
AR(1)	0.014	0.016
AR(2)	0.891	0.911
Hansen test (p-value)	0.303	0.264
The results in this table consider sales as a firm size measure (log[sales]) to avoid a collinearity issue between bid–ask spread and firm size.		

of the pecking order hypothesis, so decision makers could use more debt when needed (Myers and Majluf, 1984).

3.7 Conclusions and implications

Social capital is considered to be a significant aspect of modern socio-economic firm dynamics. This study empirically examines its influence on firms' corporate debt financing decisions. After controlling for several firm-level financial and governance variables that determine capital structure, the results show that firms with higher social capital have higher debt ratios in their structure. These results are consistent with hypothesis H_1, which predicts that a higher degree of social capital will allow firms to alleviate information asymmetry between management and shareholders and thus reduce the costs of issuing new debts to finance new projects, as anticipated by the pecking order theory of (Myers, 1977) and (Myers and Majluf, 1984). This is also consistent with the ability of the structure of social capital to mitigate information asymmetry and consistent with hypothesis H_3, which postulates that MSC can alleviate asymmetric information. In addition, the results are consistent with the outcome hypothesis. Therefore, the study provides a theoretical rationale of how social capital influences corporate capital structure in the UK market. It contributes to the existing literature in several ways, which are outlined below.

First, the study results, which support those of Aggarwal and Goodell (2014a), offer new empirical evidence of the effect of the cultural and institutional environment on firms' capital structure in the UK market. In addition, these results can be used by those who are interested in social capital, such as the OECD, particularly if we know that social capital needs to be investigated in the UK and other European countries, where the information about social capital needs to be enhanced (Goergen et al., 2019). Second, compared to the recent study conducted by Huang and Shang (2019), who report a negative association between firms' capital structure and social capital, this study finds a positive and significant relation between the two. The results, consistent with those of Filatotchev et al. (2016), support the view that the UK and the US have different institutional rules and CGCs. For example, the US CGC has a propensity to add more independent directors to corporate boards, especially since the introduction of the Sarbanes–Oxley Act; however, the UK CGC recommends limiting the number of independent directors so that it does not exceed

50% of the board size. However, these differences might be related to the social capital dimension, and this study focuses on the structural dimension of social capital rather than the cognitive dimension. Therefore, the evidence of this study recommends that future works should consider both dimensions and provide a comparison of them, which is expected to result in different effects (Lins et al., 2017).

Furthermore, this study not only develops and considers an additional industry-adjusted dimension of social capital to check the robustness of the results but also adds an asymmetric information proxy to examine the nature of its influence on capital structure. Moreover, regarding the separation of the financial and non-financial firms, this study shows that in the sample of non-financial firms, social capital and capital structure are positively and significantly associated, which is not the case for financial firms. Therefore, this study suggests that future research should focus on the role of financial firms in constructing social networks. Overall, these findings are consistent with the view that friends with money are vital in financing decisions (Fan et al., 2019; Engelberg et al., 2012). Finally, with regard to the research methods, encompassing the problem of endogeneity is viewed as a crucial factor affecting socio-economic studies. In this regard, the findings of this study provide support for the implementation of system GMM in future corporate governance and corporate finance arenas.

Despite its contributions, the study has some limitations. First, it uses several variables to control the relationship between capital structure and social capital. Second, social capital can be defined and scaled in many ways. However, the study offers new evidence of the impact of social capital on capital structure and highlights the need for further research and efforts to develop social capital measures that capture the country- and firm-level social connections in the context of financial policy decisions. Indeed, several studies covered the US, but other countries such as the UK and the European countries need more efforts to develop social capital and generate a data bank for future use in relation to social capital and other socio-economic aspects. Third, the study uses quantitative techniques that fit its research methodology. However, qualitative methods could also be used to gain an understanding of the nature of social capital and financial decisions. Finally, as the results of the study are based on UK data, future studies could consider other countries or regions

to explore the relation between social capital and financial policies. All these possibilities could be considered by future research investigations.

CHAPTER FOUR

MANAGERIAL SOCIAL CAPITAL AND FIRMS' RISK-TAKING: EVIDENCE FROM THE UK

A B S T R A C T

This chapter examines the relationship between social capital and firm risk. The study employs an unbalanced panel of publicly listed UK FTSE 350 firms from 2006 to 2017. Employing a multivariate regression framework and controlling for sources of endogeneity, it provides evidence of how managerial social capital (MSC) impacts corporate risk, especially in the context of a robust empirical setting that properly addresses endogeneity concerns. However, this study demonstrates that this is important, given the substantial heterogeneity that exists across firms and by social capital measure. The findings show that MSC negatively impacts corporate risk-taking. The negative relationship can be explained by agency theory, according to which, MSC can improve monitoring quality and reduce asymmetric information by enhancing access to information, and also from the reputational perspective, which posits that socially well-connected managers care greatly about their reputation in the external labour market, which can make them more risk-averse. In addition, the relationship has been examined under financial and non-financial sample firms, where the result shows no difference between the two samples. Importantly, the result of this study is based on a robust analysis that deals with additional risk measures, board corporate governance, and the omitted variable problem. Finally, the study has important implications for managers, firms and policymakers, and, in particular, for investors making investment decisions and evaluating firm risk. It also advocates the importance of MSC for future corporate governance regulations.

Keywords: Social capital; corporate risk-taking; managerial social capital (MSC); idiosyncratic risk

4.1 Introduction

The role of directors and executives has been investigated in detail in many works, as those people are the leaders of the firm and they make its strategic decisions. Importantly, some of these works focus on the interlocks between those leaders (Abdelbadie and Salama, 2019; Goergen et al., 2019; Homroy and Slechten, 2019; El-Khatib et al., 2015; Larcker et al., 2013; Horton et al., 2012; Mizruchi, 1996). Nevertheless, a key limitation of these works is the failure to consider how social and professional networks between directors and executives impact the risk-taking decision of the firm, with the previous studies considering the direct relationship between the interlocking directorate and corporate strategic and economic decisions.

Indeed, different from the interlocking directorate, social networking encompasses larger relationships, which are not limited to the interlocking between firms through directors (Goergen et al., 2019; Fracassi, 2017). However, Carpenter and Westphal (2001) show that in addition to the Chief Executive officers (CEOs), non-executive directors who are connected with other strategic firms through external networks could offer good-quality advice and guidance, thereby improving the firm's decision-making process.

In addition, the growing attention of socially connected people, particularly directors and executives, expands to the social connections created through work environments (i.e., interlocking directorship) and from educational and social activities such as sports clubs' memberships, charities, and other non-profit organisations (García-Feijóo et al., 2021; Fracassi, 2017). In relation to studying the role of social interactions between firms, which result from multiple directorships, this type of connection through social networks can be seen as a more comprehensive means than the interlocking directorate. Accordingly, adding to the limitations in interlocking directorates research, Javakhadze et al. (2016b) argue that under the structural definition of social capital, social networks between executives and directors provide a broader means than interlocking directorates and can be

described as a means of social capital, and it is better to consider this in future research rather than the myopia of the interlocking directorate (Nicholson et al., 2004).[35]

Accordingly, social capital provided by the ties between management and potential directors (hereafter referred to as MSC) works as a mechanism to improve firm performance by alleviating unnecessary risk-taking (Ferris et al., 2017b). MSC is greatly affected by the connections of network members. Therefore, as those executives/directors are in charge of making the vital decisions in the firm, they are not outside the umbrella of agency theory (Jensen and Meckling, 1976). To illustrate this, since the evolution of modern firms, agency theory has become a vital issue for all stakeholders. It refers to the separation between ownership and control (Jensen and Meckling, 1976). Many regulations have been developed by different legal bodies around the world; for instance, the Organisation for Economic Co-operation and Development (OECD), the Sarbanes–Oxley Act in the US, and the Corporate Governance Codes (CGCs) in the UK. These regulators emphasise the importance of corporate governance and, more importantly, the independence of corporate boards and, equally importantly, develop governance mechanisms for optimising the risk-taking decisions by firms in the best interests of shareholders, particularly after the financial crisis of 2007–2009.

Consequently, it is expected that social capital will influence firms' financial policies, and that deserves more attention, particularly regarding governance functions to control and direct firm performance (Ferris et al., 2017b; Javakhadze et al., 2016b; El-Khatib et al., 2015; Fracassi and Tate, 2012; Mizruchi, 1996). Furthermore, non-executive directors who receive high attention from policymakers are expected to play a vital role in firms through their outside connections (Carpenter and Westphal, 2001). Keeping that in mind, compared to the majority of the studies on social capital that consider the US, the UK is an interesting environment to investigate the effect of social capital. Therefore, it is expected that the MSC in the UK will bring more value to firms compared to the US market (Filatotchev et

[35] This study focuses on the structural (micro base) social capital rather than the cognitive (macro base) social capital (Nahapiet and Ghoshal, 1998). Accordingly, structural social capital and micro social capital are used interchangeably. Similarly, cognitive social capital is used interchangeably with macro social capital.

al., 2016). In a related study, Goergen et al. (2019) report that the social capital in the UK needs further investigation to understand its role in the UK firms.

Social capital plays different important roles in firms' strategic decisions. In addition to its role as a governance mechanism, in which secure social networks facilitate the implementation of dynamic cooperative behaviour (Coleman, 1988), it provides a disciplinary mechanism (Kandori, 1992) and reduces the costs of legal intervention (Javakhadze et al., 2016b). Consequently, it improves firm performance by reducing the cost of borrowing, and it plays a significant role in protecting firms from the risk of failure (Hasan et al., 2020). Moreover, social capital has been addressed by the OECD (Scrivens and Smith, 2013), specifically since the introduction of the Sarbanes–Oxley Act, to enhance board oversight and its control role by increasing the number of independent directors (Linck et al., 2008).

In addition, social networks provide a tool to eliminate ambiguity and risk. This occurs through the social capital informal mechanism of providing secure deals between participants that mitigate risk-taking (Bloch et al., 2008). Therefore, a greater number of social ties held by individuals in the organisational hierarchy enables network participants to secure more power (Brass and Burkhardt, 1993). In this regard, Keltner et al. (2003) argue that those with more power tend to accept more risks. However, despite all this evidence, the majority of the published work in this area is based on CEO social capital or regional social capital, and it is limited to the traditional interlocking directorates (Panta, 2020; Abdelbadie and Salama, 2019; Ferris et al., 2019; Ferris et al., 2017a; El-Khatib et al., 2015).

Accordingly, this study intends to examine the relationship between MSC and risk-taking behaviour in FTSE 350 firms listed on the London stock exchange. It illustrates how social capital can affect corporate risk-taking in the UK. The motivation to use social capital was stimulated by the paradoxes and inconclusive evidence of how social capital is linked to corporate financial decisions and outcomes. Roberts and Whited (2013) argue that endogeneity concerns are the most common issue in corporate finance studies; these can be in the form of omitted variables, simultaneity, or measurement error. Therefore, the implications of empirical works in corporate finance and their usefulness are subject to

endogeneity concerns, which should not be ignored. Wintoki et al. (2012) illustrate that a large body of empirical research in governance is plagued by endogeneity issues. Therefore, this study controls for all three forms of endogeneity concerns by implementing the dynamic panel generalised method of moments model (system GMM). Consequently, it aims to address in different ways some of the weaknesses in existing works and thus extend and contribute to existing knowledge in social capital and risk management studies in several ways, as detailed below.

First, this study is one of the rare works that consider the association between social capital and corporate risk-taking in general and, to the best of my knowledge, it is the first to consider the UK market. Previous studies pay more attention to board characteristics and firm performance. Due to the financial crisis of 2007–2009, risk management rules and regulations and their long-term horizon are given more consideration in the 2010 UK CGC. To clarify this, the adjective 'prudent', generally used in association with risk, has been added to describe good governance practices in the 2010 Code. Moreover, the word 'long-term' is used only five times in the 2008 Code compared to ten times in the 2010 Code. To ensure that the estimates are free of misspecification and bias, this study deals with endogeneity concerns by considering the general GMM system model to encompass endogeneity sources, that is, omitted variables, simultaneity and measurement error, to obtain unbiased and consistent results (Roberts and Whited, 2013; Wintoki et al., 2012). It is also argued that fixed effects are not suitable for fixing endogeneity concerns. Equally important, the study includes a risk committee variable, measured as a dummy variable that takes the value one if the firm has a risk committee on its BOD and zero otherwise. In this regard, it is proposed that a firm which has a risk committee on its board influences decision concerns about risk-taking, as well as using alternative risk measures.

Second, previous studies that have investigated social capital and risk-taking decisions are limited to CEO social capital or the county level of social capital, with more focus on US counties data, but not on the firm level (e.g., Panta, 2020; Ferris et al., 2019; Hasan and Habib, 2019a; Ferris et al., 2017a). However, this study argues that the differences in social aspects, institutional differences, and other regulatory differences between countries might result in different corporate risk management decisions from the social capital perspective.

In addition, despite the similarities in the corporate governance structure between the UK and the US, the US represents a strong governance regime with strong monitoring and disciplining mechanisms, whereas the UK is described as a weak governance regime. This notable difference in governance regime can be clarified if a comparison is made between the number of non-executives on the boards of directors (BODs) of each country. In the UK, where the CGC is voluntary on a comply or explain basis, this can result in more opportunistic behaviour by directors, who may place their benefits ahead of shareholders' interests, which will incur additional agency costs. Consequently, it is argued in this paper that such variances in the regimes are vital when examining the nature of corporate risk-taking behaviour from the social capital perspectives of the UK. The 2010 UK CGC does not consider independent directors to be independent if they are part of an interlocking directorate, or if they have a strong connection with external firms, which directly impacts the structural social capital of firms. In addition, the OECD emphasises the importance of social capital with regard to firm performance (Scrivens and Smith, 2013). Therefore, this study provides a clearer insight into the effect of social capital on risk-taking in the UK, which will enable decision makers and investors to gain a better understanding of how the connections affect risk-taking.

Furthermore, there are two ways of calculating social networks, namely using the individual level and firm level (Borgatti et al., 1998; Wasserman and Faust, 1994). Indeed, previous studies that consider the link between social capital and risk-taking pay more attention to the use of the individual level of social capital, particularly based on the CEOs' social capital, or employ the CFOs' social connections (e.g.,Dbouk et al., 2020; Ferris et al., 2019; Fogel et al., 2018; Ferris et al., 2017a). Therefore, this study has overcome this limitation and uses the social networks of the directors/executives at the firm level. However, the firm level of social capital has received great attention from (Fracassi, 2017) as a determinant of a firm's financial policies and, importantly, (Fracassi and Tate, 2012) highlight that the firm level of social capital is essential in relation to the board's corporate governance. Accordingly, the effect of MSC on risk-taking has been considered at the firm level, and in addition to the use of board structure governance variables, the interaction between MSC and governance variables has been implemented. Notable previous studies on boards are limited to the use of a governance index (Dbouk et al., 2020). Additionally,

Akbar et al. (2017) argue that the use of idiosyncratic risk is an efficient measure of risk at the firm level.

Moreover, this study acknowledges the differences between financial and non-financial firms (Akbar et al., 2017) by dividing the sample into three categories: all firms, non-financial firms, and financial firms. Ferris et al. (2017b) report that social capital can enhance the role of corporate governance; therefore, this study controls for corporate governance variables and tests the effect of the interaction between governance variables and social capital on the risk-taking decision.

Finally, the study controls for industry effects by considering the adjusted measure of MSC by accounting for the difference between a firm's MSC and the average MSC of all firms in that industry in the same year, excluding the focal firm.

Accordingly, using a panel dataset based on FTSE 350 firms from the UK from the period 2006–2017, 3,137 firm-year observations were made, with evidence found of the relationship between social capital and risk-taking decisions. In particular, the relationship shows that social capital has a negative and significant influence on firms' risk-taking decisions. These results have also been examined under financial and non-financial firms. The study findings are in line with agency theory and the reputation hypothesis (Hirshleifer, 1993; Fama, 1980).

4.2 Literature review and hypotheses development

Studying the effect of social capital in relation to various fields depends to a large extent on how social capital is created. This results in several dimensions of social capital, which vary depending on whether the social capital dimensions are structural or cognitive (Nahapiet and Ghoshal, 1998). Accordingly, it is not easy to provide one definition of social capital that can fit all social capital aspects (Javakhadze et al., 2016b; Lin, 2002). This suggests that different social capital measures should be used to provide a better insight into the nature of the social capital effect in different fields such as corporate finance.

However, Wellman and Frank (2001) assert that social ties are essential social capital determinants. In addition, Bourdieu and Wacquant (1992,p. 119) explain that social capital

is ‘the sum of the resources, actual or virtual, that accrue to an individual or group by virtue of possessing a durable network of more or less institutionalized relationships of mutual acquaintance and recognition’. Moreover, Bourdieu (1986a, p. 249) states that ‘the volume of social capital possessed by a given agent … depends on the size of the network of connections that he can effectively mobilize’. Indeed, social capital has several definitions; however, these are outside the scope of this study, which follows Javakhadze et al. (2016b) by using MSC as a measure of social capital. However, using the social capital concept was not popular in previous works in corporate finance; instead, the use of social networks as a concept was more popular. Accordingly, that was criticised by Javakhadze et al. (2016b), and they clarify that researchers were reluctant to use social capital instead of social networks which can be created through different social links, such as work, education, and other social activities (Fracassi, 2017; Fracassi and Tate, 2012). It is worth mentioning that the BoardEx database contributes to increasing and enhancing the social capital studies, particularly in relation to the firm performance, by offering data about the social networks between directors and executives in different firms (Javakhadze et al., 2016b; El-Khatib et al., 2015; Larcker et al., 2013; Engelberg et al., 2012)

Consequently, studying the nature of the socio-economic effect that takes place through social networks needs to be precisely determined to provide accurate and generalisable results. Therefore, to consider the study of social capital in corporate finance as a new emerging topic, it is necessary to identify the dimensions of social capital and how it may affect different financial decisions (García-Feijóo et al., 2021; Ferris et al., 2019; Huang and Shang, 2019; Lins et al., 2017). Importantly, the socio-economic effect is largely dependent on the society and place, and therefore what might be valid somewhere is not necessarily valid everywhere; this is largely applicable for social capital studies (Hartlieb et al., 2020; Hasan et al., 2020).

Accordingly, research that explores the associations between MSC and firm risk-taking is still at a very early embryonic stage. Moreover, among the limited studies to date, the overwhelming majority focus purely on the US market, even though wider interdisciplinary corporate finance research has established that country-specific institutional environments are relevant for a firm’s performance outcomes. The following section provides a brief

introduction to the UK setting, which considers the role of board structure as a governance mechanism and highlights the gap in the extant literature, which ignores to a large extent the role of corporate governance. A review of relevant literature on risk-taking and social capital is provided, and then the hypotheses are presented.

4.2.1 UK setting

In general, corporate governance rules around the world have been revised, with more attention paid to the risk-taking aspect, especially since the global financial crisis (GFC) in 2007–2009. In the UK, considerable attention has been paid to the roles played by BODs, as well as to senior managers and how their actions can influence firms' risk-taking, especially after the financial fraud cases that occurred in the US in the early 2000s, as well as the broad influence of the financial crisis in 2007–2009. Consequently, after the significant effects of the crisis, US governmental bodies took action to recover more than $700 billion of the assets held by financial institutions. At the same time, the UK government devised a £500 billion rescue package (Erkens et al., 2012), which helped the government to bail out many firms. For instance, the government provided an emergency loan to the Northern Rock bank from the central bank, and it was converted into state ownership in February 2008 (Hall, 2009). In the US, since the introduction of the Sarbanes–Oxley Act (2002), corporate governance has specified guidance for board attributes and internal control mechanisms to enhance accountability and moderate the risk of bankruptcy.

In the UK, which is the focus of this chapter, Section C of the 2010 CGC states: 'The board is responsible for determining the nature and extent of the significant risks it is willing to take in achieving its strategic objectives. The board should maintain sound risk management and internal control systems' (UK Corporate Governance Code 2010, p.7). Moreover, in 2011, the Financial Reporting Council (FRC) issued a report on 'Boards and Risk', which clarified the tasks of BODs with regard to risk management. The report summarised 17 points outlining the general framework of board/management risk-taking decisions.[36] For instance, it states: 'The Board's overall responsibilities included

[36] For more information, refer to the boards and risk report via the following website: https://www.frc.org.uk/getattachment/b88db2b6-af08-4a0e-9755-ab92de1268c2/Boards-and-Risk-final-Sept-2011.pdf (Accessed 20/07/2020).

determining the company's approach to risk, setting its culture, risk identification, oversight of risk management, and crisis management' (FRC, 2011, p.2). Moreover, the report stated that 'better risk decision-taking should not automatically mean less risk-taking, which is essential to entrepreneurial activity' (FRC, 2011, p.2). The inclusion of cultural settings and risk-taking together highlights the importance of considering both aspects together, an area that has rarely been investigated in the corporate finance literature (Illiashenko and Laidroo, 2020; Otchere et al., 2020; Li et al., 2013). Accordingly, the CGCs do not ignore the risk-taking in relation to the cultural settings; however, that may need further development, particularly in relation to the social capital aspect (Abdelbadie and Salama, 2019).

Under the UK governance mechanisms, firms are expected to follow the governance recommendations voluntarily; that is, listed firms follow the recommendations, or they have to justify why they do not (McKnight and Weir, 2009). This may lead to a deviation from shareholders' best interests, and it needs an alternative monitoring option, which might be achieved by working under a high level of social capital (Schneider et al., 2017; Fukuyama, 1997; Kandori, 1992). Furthermore, the UK regulatory body focuses on the monitoring role of the independent board directors, which was clarified by the Cadbury Report (1992) and the UK CGCs (2003 to 2018). This area experienced many governance rules and social developments during the study period. Moreover, social connections, which are one of the important board attributes that influence risk-taking decisions in the UK, have been ignored (Mathew et al., 2016).[37,38]

Accordingly, from the regulatory body point of view, independent directors' main function is monitoring, with insufficient attention paid to the other aspect of directors being a source of capital that can enhance firm profitability through the integrated roles of the directors'

[37] The study first incorporated all UK market firms, but after the data were filtered to match the BoardEx and DataStream databases, and subject to the network data availability for the UK, 50% of the selected firms were lost after matching the FTSE all firms with BoardEx data. However, in comparison to the FTSE350 firms, 80% of the firms have available data. Generally, data in Europe are not covered as adequately as in the US, although the UK market is still covered better than those of other European countries (see Goergen et al. 2019).

[38] Using the FTSE 350 allows the data to be analysed in relation to the firms with large market capitalisation. Lins et al. (2017) argue that small firms have financial problems such as low liquidity, and that they are subject to more price pressure effects when trading.

functions. Indeed, this is different from the Higgs Report (2003), which provides a different perspective on the role of independent directors:

> My view of the role of the non-executive director in this process contrasts with that of US regulators, who have tended to emphasize the monitoring role at the possible expense of the contribution the nonexecutive director can make to wealth creation. These two roles are, I believe, complementary and should be seen as such. (p.12)

Consequently, from a theoretical perspective, these two different views are explained by agency theory and resource dependence theory (RDT). Therefore, some studies use the integration of the two theories (Zona et al., 2018; Johnson et al., 2013; Hillman and Dalziel, 2003).

Under agency theory, conflicts of interest are rooted in the principal–agent relationship ((Fama and Jensen, 1983; Jensen and Meckling, 1976) propose that non-executive directors are more motivated to perform the monitoring role than insiders, and therefore they may mitigate such conflicts of interest (Tian et al., 2011). Consequently, independent directors are more cautious to protect shareholder interests and to protect their reputation in director labour markets (Harjoto and Wang, 2020; Fama and Jensen, 1983). This reputation effect motivates the monitoring role and can also be extended to different board members, namely those who have a high level of social capital (Harjoto and Wang, 2020; Kandori, 1992; Diamond, 1989). Conversely, RDT suggests that directors are resource providers who provide legitimacy and access to key constituents outside the firm, as well as useful advice and counsel; work as channels for information exchange between external institutions and firms; and help in the development of firms' strategies (Amin et al., 2020; Hillman et al., 2009). Moreover, the concept of board capital comes from the combined effect of the social and human capital of each member (Hillman and Dalziel, 2003). Therefore, social capital refers to the ability of the board to provide resources through its network of relationships (Brullebaut et al., 2021; Tian et al., 2011).

However, corporate risk-taking, which can be defined at either the managerial or organisational level (Palmer and Wiseman, 1999), is an important factor that affects a firm's current and future performance. Accordingly, managerial social networks, which impact managerial attributes, can significantly influence the risk-taking decision (Panta,

2020; Ferris et al., 2019). Keeping that in mind, while risk-taking is necessary to pursue firm growth opportunities and create firm value, an excessive level can have undesirable consequences for firms as well as for key stakeholders, as highlighted by the GFC of 2007–2009. However, among the few studies that consider the effect of social capital on risk-taking, the corporate governance roles are not clearly identified (Hasan et al., 2020). Moreover, corporate governance roles related to the board structure (such as board size, board independence, gender, and board committees) are ignored. In fact, board structure is a critical issue that must be considered in relation to the risk-taking studies in general and to the works related to investigating social capital and risk-taking (Oyotode-Adebile and Ujah, 2021; Akbar et al., 2017).

In addition, numerous studies have analysed corporate risk-taking (Akbar et al., 2017; Cohen et al., 2013; John et al., 2008; Wiseman and Gomez-Mejia, 1998). In this body of literature, it has been shown that several essential corporate governance aspects consistently influence corporate risk-taking. For instance, building on the explanations of the agency model, Wiseman and Gomez-Mejia (1998) provide evidence that explains managerial risk-taking behaviour. They suggest that executive risk-taking differs across and within various monitoring forms and that agents may seek risk or avoid risk-taking behaviour. Their results improve and expand on the agency-based corporate governance literature on executive risk-taking; therefore, it is predicted that risk-taking differs when it is related to monitoring mechanisms which can be enhanced by holding better connections with other firms (Harjoto and Wang, 2020). Moreover, Cohen et al. (2013) found that the interaction between corporate governance and managerial incentives impacts firms' operations and investments, and that since the introduction of the Sarbanes-Oxley Act of 2002, firms have seen significant reductions in corporate risk-taking activities due to its regulations. In relation to this, Bargeron et al. (2010) used sample firms from the US, the UK and Canada and found that Sarbanes–Oxley Act (SOA) provisions, namely the role of non-executive directors, an increase in director and officer liability, and new financial control rules, have a significant effect on decreasing risk-taking for US versus non-US firms since the introduction of the Sarbanes-Oxley Act. In addition, in a cross-country analysis, Acharya et al. (2011) report that cash-flow risk decreases as a result of stronger creditor rights. In contrast, John et al. (2008) show that firms can take more risk under

strong investor protection, but that this is due to value-enhancing investments. They assert that investor protection is positively related to firm growth and risk-taking.

Accordingly, ignoring the role of corporate governance in relation to MSC and risk-taking may lead to misleading results, particularly if it is related to the monitoring and reputation effects, which are significantly related to MSC (Harjoto and Wang, 2020; Hasan et al., 2020; Ferris et al., 2019; Fracassi and Tate, 2012). Keeping that in mind, the risk-taking decision can be moderated by the managerial reputation aspect. Accordingly, Akbar et al. (2017) show that in addition to the existence of independent directors on the BOD, powerful CEOs can mitigate firms' risk-taking practices. They used data from financial industry firms listed on the UK market, illustrating that managers become more risk-averse since they have fears about loss of their reputation and the risk of employment concerns. In relation to this, Javakhadze et al. (2016b) argue that MSC works as a disciplinary mechanism which reduces agency problems between investors and insiders due to the consequences of reputation loss. Similarly, Hirshleifer and Thakor (1992) demonstrate that managers ignore risky investments because of the pressure of reputation building.

In relation to this, Fan et al. (2019) document a negative relationship between the interaction of the CEO's social capital with the board monitoring function and firm value, which supports the theoretical interpretations of the agency theory view. At the same time, when the CEO's social capital interacts with the advisory function, the authors found a positive impact on firm value, which lends support to the RDT viewpoint. However, Horton et al. (2012) indicate that it is very important to consider other directors to reflect firm-level social capital, reporting a positive impact of social capital on firm value. Javakhadze et al. (2016b) report similar results. Accordingly, the effect of the level of social capital on corporate financial decisions is an empirical question, specifically regarding firms' agents, who bring a high level of social capital at the firm level. This is also related to the number of non-executive directors (Amin et al., 2020; Zattoni and Cuomo, 2010) and concerns the environmental resources that facilitate the role of social capital (Lins et al., 2017; Pfeffer and Salancik, 1978).

Furthermore, the OECD (2004) asserts that for BODs to be independent, they should include a sufficient number of independent directors who are not employed by the firm and

who do not have family relations or other ties. Moreover, in the paper supported by the OECD, Scrivens and Smith (2013) emphasise the importance of social capital by identifying four related scopes: personal relationships, social network support, civic engagement, and trust and cooperative norms. These scopes are mostly related to societal characteristics and cognitive social capital. Consequently, recent studies assert that social capital can enhance the economic value and support the building of reputation for honest dealing in economic activities through the disciplinary role of reputation loss (Harjoto and Wang, 2020; McMillan and Woodruff, 2000; Kandori, 1992).

4.2.2 Risk-taking and social capital

In corporate finance, the relationship between social capital and financial decisions has been investigated under the structural or cognitive social capital definition. In this regard, structural social capital is defined under the micro-social capital aspect, whereas cognitive social capital is defined under the macro-social capital aspect.[39] Generally, social capital exerts its influence on corporate finance through four mechanisms related to its nature: working as a punishment and reward system, working as an information flow channel, working as a trusted channel, and altering preferences. In the corporate finance studies, Javakhadze et al. (2016b) argue that the first three mechanisms have a significant influence on investments and external financing sensitivities to cash flow and firm value. They define social capital as managerial social connections that were established through education, employment and other social activities, thus building MSC. Accordingly, MSC is used under the structural social capital definition.

Social capital has a vital advantage in enhancing economic efficiency. Besides its ability to work as a tool to improve economic efficiency, it can build a reputation for honest deals in business transactions, in which participants may be punished by losing their reputation if they do not act appropriately; in this way, social capital is a disciplinary mechanism (McMillan and Woodruff, 2000; Kandori, 1992). Therefore, socially connected agents need low costs of protection against possible expropriation and manipulation. In this way, social capital also reduces the agency costs between firms and shareholders by increasing the fear of reputation loss among agents (e.g. board and management members) (Kandori,

[39] For more information, refer to Javakhadze et al. (2016).

1992). This aligns with the finding of Engelberg et al. (2012) that the costs of borrowing can be reduced through managerial social connections between banks and borrowers. Accordingly, it is expected that social capital will also reduce risk-taking.

In addition, social capital works as an information channel that transfers meaningful information through social networks. Under the imperfect market hypothesis, seeking information from financial markets implies search costs and fears of contract failure. In this regard, the concept of social capital has been employed in numerous economics and finance studies (Cohen et al., 2008; Hochberg et al., 2007; Fafchamps and Minten, 1999). These works provide new evidence of the ability of social capital to share and rotate information through social networks, a process that affects portfolio decisions and equity market participants. Consequently, Javakhadze et al. (2016b) argue that social capital plays a role in asset pricing by providing useful information through social networks which work against expected failures in financial markets, as it alleviates information asymmetry between participants. Accordingly, it has effects on corporate finance decisions, particularly in terms of securing better external finance conditions, which also significantly affects corporate risk-taking. Unfortunately, most of the works referred to above do not consider the UK market, which is suitable for investigation because of the diversity of international firms listed on the London stock exchange.

Furthermore, social capital has an important impact on finance through trust. In this view, trust is a social capital mechanism that allows more reliability in transactions, which, in turn, facilitates business operations by optimising transaction costs (Hasan et al., 2020; Granovetter, 1985). Economists recognise the importance of trust embedded in social capital as a key to completing successful transactions. At the macro level, social capital helps in achieving better performance and facilitates the economic growth of national governments (Knack and Keefer, 1997; La Porta et al., 1997). At the micro level, each business deal includes a level of trust, and that social capital then allows agents to operate even in markets characterised by asymmetric information conditions (Hartlieb et al., 2020; Arrow, 1972). In addition, trust that comes from social capital helps to apply and enforce the related codes of conduct that agreed based on cooperative norms (Oyotode-Adebile and Ujah, 2021; Fukuyama, 1997; Uzzi, 1997; Coleman, 1988), which potentially ensures

efficient allocation of resources (Harjoto and Wang, 2020; Lins et al., 2017), and that leads to reduced transaction costs (Amin et al., 2020; Hartlieb et al., 2020; Grossman and Hart, 1986). Therefore, as argued by Javakhadze et al. (2016b), mutual trust between agents works to overcome the incompleteness in contracts and provide better access to external funds when there is no complete official system of contract execution.

As a further illustration, social capital has been viewed as insurance against firm-specific risk. In relation to this, Hasan and Habib (2019a) illustrate that the relationship between county-level social capital and idiosyncratic[40] risk is negative, specifically reporting that a county with social capital in the 75th percentile is associated with 24% less idiosyncratic risk compared to a firm headquartered in a county with social capital in the 25th percentile. They add that this relationship is moderated by corporate social responsibility (CSR) and the quality of financial reports.

Furthermore, previous research investigated the impact of social capital on corporate finance, including dividend policy (Hasan and Habib, 2020; Davaadorj, 2019), capital structure (Huang and Shang, 2019), risk-taking (Panta, 2020; Ferris et al., 2019), and firm performance (Zona et al., 2018; Larcker et al., 2013), offering contrasting perspectives on the relationship between social capital and firm performance. The first perspective refers to managerial opportunism based on agency theory (Jensen and Meckling, 1976). Under this theory, social capital is considered to impede firm performance by facilitating managerial opportunistic behaviour (Hoi et al., 2019; Fich, 2005; Perry and Peyer, 2005). Another perspective advocates that social capital is a source of value for firms, which improves their performance; this position is based on RDT (Pfeffer and Salancik, 1978). From this perspective, social capital is beneficial for firm performance by relaxing resource constraints (Amin et al., 2020; Zona et al., 2018; Mizruchi, 1996; Rosenstein and Wyatt, 1994; Pfeffer and Salancik, 1978).

To explain this, two sources of social capital can be determined in relation to corporate finance studies: cognitive social capital, which is more related to the environment (Zona et al., 2018; Lins et al., 2017; Scrivens and Smith, 2013), and structural social capital, which

[40] This study uses idiosyncratic risk, firm-specific risk and unsystematic risk interchangeably.

is more related to agents such as board directors, so it is related to firm characteristics (Javakhadze et al., 2016b; Tuugi et al., 2014). Therefore, this study focuses on the effect of social capital at the structural level and risk-taking, more specifically on the idiosyncratic risk that is related to firm-specific characteristics (Hasan and Habib, 2019a).

Contradictions in the extant literature result in confusion for those who are interested in studying social capital in relation to factors such as risk-taking. In addition, the effects of social capital on firm performance have different expectations, such as whether it will help management and foster monitoring (Adams et al., 2010; Fama, 1980) or encourage the deviation of management interests from shareholder interests (Adams and Ferreira, 2007). Consequently, an accurate and precise investigation is needed to explain the used dimension and measure of social capital. Accordingly, this study focuses on the structural social capital through MSC, which needs further development (Javakhadze et al., 2016a).

However, some researchers empirically investigated the relation between social capital and risk-taking (Dbouk et al., 2020; Panta, 2020; Ferris et al., 2019; Hasan and Habib, 2019a; Ferris et al., 2017a). The results provided have different outcomes and explanations. Some relate to the differences in the social capital scales and periods and others relate to the theoretical point of view. Accordingly, the relationship between social capital and risk-taking in these studies has been explained under different perspectives. On one hand, using the structural social capital, (Ferris et al., 2017a), (Ferris et al., 2019) and (Dbouk et al., 2020) show that the relationship between social capital and risk-taking decisions is positive. On the other hand, (Hasan and Habib, 2019a) and (Panta, 2020) use the cognitive dimension of social capital, and they report that the relationship is negative.

To emphasise this, under the structural social capital, Ferris et al. (2017a) found that social ties stimulate corporate policy actions, which lead to greater volatility in stock returns. Moreover, they demonstrate that an increase in risk-taking resulting from high CEO social capital is value-enhancing for firms. Similarly, Ferris et al. (2019) show that CEOs with a high level of social capital tend to accept riskier investments, asserting that this relationship is affected by the culture of the country in which the firm is incorporated. Additionally, Dbouk et al. (2020) report similar outcomes. Unfortunately, the studies conducted by (Ferris et al., 2017a), (Ferris et al., 2019) and (Dbouk et al., 2020) are limited to CEOs'

social capital, ignoring other people in firms who may have many more connections that should be considered (Horton et al., 2012). In addition, Dbouk et al. (2020) results are based on bank risk-taking, which adds to the argument on how financial firms may differ from non-financial firms in studying social capital. Therefore, separating financial and non-financial firms can contribute to our understanding of the association between risk-taking and social capital.

However, under the cognitive social capital, as applied by Hasan and Habib (2019a) and Panta (2020), employing a social capital index based on the county or regional level revealed that the level of social capital has a negative influence on the risk-taking decision. Specifically, Hasan and Habib (2019a) illustrate that idiosyncratic return volatility is a very important risk measure which should be considered when the association between social capital and risk-taking is investigated. In their research, they suggest that firms located in a country with a high level social capita have significantly lower idiosyncratic return volatility. Similarly, Panta (2020) shows that the environment transmits the culture of the firm to its managers and thereby impacts their corporate decision-making. However, Panta (2020) found that the combined effects of excessive risk-taking and social capital result in the destruction of the value of firms.

Notably, studies that investigate the cognitive dimension of social capital are based on the county level and the US and do not consider the MSC level. Therefore, a more critical investigation of the ignored effect of social capital based on the social networks between firms' directors, namely MSC, and risk-taking is needed to advance our knowledge (Hasan et al., 2020; Ferris et al., 2019). Nevertheless, studies that consider the structural dimension of social capital are also based on the US setting, which may not apply to other markets (Brullebaut et al., 2021).

Importantly, all the above-mentioned researchers under both dimensions of social capital used the Ordinary Least Squares regression (OLS) estimation method despite the fact that the relationship between social capital and risk-taking decisions is subject to the endogeneity problem (Ferris et al., 2019; Sila et al., 2016; Wintoki et al., 2012). More importantly, board structure attributes have been ignored in these studies, which may lead to misleading results (Mathew et al., 2016). Moreover, the studies concentrate more on US

data in relation to cognitive social capital, with little evidence provided regarding structural social capital; therefore, this study adds new evidence of the relationship between structural social capital and risk-taking. Therefore, it contributes to the small amount of existing evidence and clarifies the confusion in the outcomes of previous research. Moreover, the US regulations and environment are different from those of other countries such as the UK (Goergen et al., 2019; Renneboog and Zhao, 2013).

However, risk-taking has different outcomes depending on different cultures, religions, and societies. In this regard, Díez-Esteban et al. (2019) used a sample of 37 countries, arguing that religion was an external monitoring mechanism and revealing that risk-taking decisions were negatively influenced by Catholic and Islamic societies, whereas in Protestant societies, the influence was positive. Furthermore, they illustrate that high power distance, masculinity, individualism and long-term orientation lead to a rise in the level of risk-taking, whereas high levels of uncertainty avoidance alleviate it. In addition, Li et al. (2013) illustrate how culture affects corporate risk-taking by shaping a nation's formal institutions and managerial decision-making with evidence from 35 different countries. They report that uncertainty avoidance and harmony alleviate corporate risk-taking, whereas individualism increases it. In the same vein, Ferris et al. (2019) obtained very similar results when they applied Hofstede's cultural dimensions to risk-taking. Ashraf et al. (2016) also found a positive relationship between risk-taking and Hofstede's cultural dimensions. Specifically, they found that low uncertainty avoidance, higher individualism and low power distance have a positive influence on a firm's risk-taking. In contrast, Illiashenko (2019) and Illiashenko and Laidroo (2020) show that the association between individualism and risk-taking is negative. Therefore, collectivist societies tend to seek more risks than individualistic societies such as the US (Hsee and Weber, 1999). Accordingly, Illiashenko and Laidroo (2020) assert that social networks are the drivers for providing help for network members in the case of failure.

Consequently, this study considers the call for new research in previous works to gain a better understanding of the relationship between social capital and firm risk-taking by focusing on structural social capital, which is defined based on the social networking between agents, to reflect individual connections, which can be used to portray a wider

scope of connections than the interlocking, by calculating firms' social capital through their employees (García-Feijóo et al., 2021; Wasserman and Faust, 1994). Previous research has not provided an in-depth insight into this aspect; however, some works have considered it to a limited extent. For instance, Ferris et al. (2017a) show that social capital which is built under the structural definition has a positive effect on a firm's risk-taking, which is similar to Ferris et al. (2019) findings. However, they do not consider the firm level of social capital, which can be more representative (Horton et al., 2012). Therefore, as they consider CEO social capital, it is difficult to generalise their study results at the firm level. Moreover, cognitive social capital has been considered in relation to risk-taking decisions; according to this definition, social capital has a negative impact on risk-taking decisions, as reported in recent studies conducted by Hasan and Habib (2017) and Panta (2020). Consequently, this study fills the gap in the literature by considering MSC, which reflects the firm level of social capital. In addition, this study does not ignore the expected influence of the board governance variables, and it provides a better insight into the difference between the financial and non-financial firms (Oyotode-Adebile and Ujah, 2021; Dbouk et al., 2020; Hasan et al., 2020; Abdelbadie and Salama, 2019; Akbar et al., 2017).

Consistent with the argument regarding the direction of the social capital effect on risk-taking, this study expects that social capital will impact risk-taking decisions by mitigating the agency problem between parties (agents and principals). Social capital is considered as a means of information transfer that reduces information asymmetry and therefore transaction costs. Firms headquartered in high social capital areas exhibit significantly less asymmetry in cost behaviour (Hartlieb et al., 2020), better accounting transparency and conservatism (Jin et al., 2017), and a lower probability of committing fraud by misrepresenting financial information.

Accordingly, based on the agency theory of Jensen and Meckling (1976), in which managers are concerned about their reputation and are more motivated to perform a better monitoring function than others who have less social capital, it is implied that they will act more conservatively by adopting more risk-averse behaviour (Akbar et al., 2017; Fama, 1980). Therefore, according to the reputation hypothesis, directors will tend to avoid risky investments to protect the image of their firm (Harjoto and Wang, 2020; Pathan, 2009).

Accordingly, following this argument, it is predicted that MSC reduces risk-taking behaviour. It is hypothesised that:

H_1: The relationship between MSC and risk-taking is negative.

However, based on the extant literature, which contains many contradictions regarding the relationship between MSC and risk-taking, this study develops another two hypotheses to verify the main claim of the first hypothesis (H_1). After adding an adjusted social capital measure and considering the average value for each industry, this study uses the MSC adjusted to the industrial average. The second hypothesis is therefore:

H_2: The relationship between MSC and risk-taking is constant after adjusting the MSC to each industry.

Moreover, as previous studies in finance make no clear distinction between financial and non-financial firms, this study implements three regression analyses based on all firms, non-financial firms, and financial firms to gain a better understanding of different aspects. Consequently, the third study hypothesis is:

H_3: The relationship between social capital and risk-taking is not affected under the financial and non-financial firms.

Accordingly, this chapter has three hypotheses that can be empirically investigated, and the main result of this chapter is based on the whole sample of firms.

4.3 Sample, model, and variable construction

The study employs rich data on listed UK FTSE 350 firms to analyse the effect of social capital on firms' risk-taking decisions. Following previous studies (Goergen et al., 2019; Ferris et al., 2017b; Fracassi, 2017; Javakhadze et al., 2016b; Fracassi and Tate, 2012), it constructs a measure of social capital at the firm level. Two primary indicators of social capital are developed: MSC and adjusted MSC (ADJ_MSC). The level of social capital in the UK is considered to be higher than that in the US, which could, for example, lead to greater firm valuation and, more generally, render the UK market of particular interest for the study of the impact of social capital on risk-taking decisions (Filatotchev et al., 2016).

4.3.1 Sample and data

The sample is constructed using data from two main databases: BoardEx and Thomson DataStream. Those from BoardEx represent UK firms during the study period from 2006 to 2017.[41] The sample firms also include both listed and delisted firms from the FTSE 350 Index during the sample period to account for survivorship bias.

There is a big debate surrounding the improvements in the UK CGC, which is updated almost every year, together with a concerted call to emphasise effective CG systems and structures to guarantee firms' continued survival. Consequently, the UK CGCs of 2010, 2012, 2014, 2016 and 2018 explained the role of BODs in adding value to firms. For instance, the FRC (2012) showed that an effective board must work to increase and enhance a firm's values, culture, and behaviours. Risk-taking decisions are connected with the CGC. More specifically, in relation to independent non-executive directors in UK firms, the CGC asserts that for all firms listed on the FTSE 350 Index, their board should include 50% independent directors, a rule which impacts the MSC of board members and the firm.

As the objective of this study is to investigate the relationship between corporate risk-taking and social capital in the UK, the primary study variable is MSC. In relation to this variable, firms should have obtainable information that comprises directors' networks through current and past employment, education, and other social activities (Goergen et al., 2019; Fracassi and Tate, 2012).

Accordingly, the study sample meets several criteria and filters. First, the study incorporated all the data for UK firms from the BoardEx database, so the firms need to be part of this to develop the MSC indicators and governance variables. Second, it used the DataStream/Worldscope databases for the market and accounting data. In addition, it compared the data with the whole FTSE Index, although the sample represents less than 50% of this, so after comparing it with FTSE 350 firms, which represent more than 80% of the index firms, the FTSE 350 Index was considered. Furthermore, it matched the BoardEx data with those from DataStream/Worldscope using the corporate International Securities Identification Number code,[42] and the data were then checked manually.

41 BoardEx has had a big data update since 2006 (e.g. Larcker et al. 2013).

[42] Some missing data were collected from the FAME, Bloomberg, annual reports, and https://www.gov.uk/.

Additionally, the Industry Classification Benchmark (ICB) was used to discriminate between two sub-samples, the financial and non-financial firms, to gain better insight into the effect of social capital in different types of firms. However, the whole sample of firms was used to discuss the main results. Finally, the study was based on 4,325 firm-year observations, with 333 firms used in the analysis, based on an unbalanced dataset. For more consistency with previous works on corporate finance and to overcome the effects of outliers, all the control variables were winsorised at the 1st and 99th percentiles (Javakhadze et al., 2016b).

4.3.2 Dependent variables

Risk-taking is generally measured by the standard deviation of a performance measurement over a specific time. Recent studies assert that the use of unsystematic (or idiosyncratic) risk elements is vital for investors (Ferris et al., 2019; Hasan and Habib, 2019a; Akbar et al., 2017; McAlister et al., 2007) . Similarly, CSR studies, which are closely related to social capital studies, as illustrated by Lins et al. (2017) and Hasan and Habib (2019a), have linked the idiosyncratic risk measure with corporate social performance (Luo and Bhattacharya, 2009). Therefore, this study focuses on the idiosyncratic measure, which represents around 80% of total risk, but ignores systematic risk, which is a result of the volatility of corporate cash flows to the business cycle, which is beyond a firm's control. In contrast, idiosyncratic return volatility for a firm represents the outcome of its business activities and strategic plan (Porter and Strategy, 1980). It is highly possible that decisions by BODs are related to idiosyncratic risk and have an effect on it (Akbar et al., 2017; Jin, 2002). Panta (2020) reports that social capital under the cognitive dimension influences both idiosyncratic and total risk. Consequently, this study uses idiosyncratic risk and total risk measures.[43]

The main dependent study variables are firm-specific risk[44] and total risk. Firm-specific risk is estimated using the capital asset pricing model (CAPM) and market model. In the further analysis section, it also includes the Fama and French (1993) model (FF3) to

[43] This study focuses on unsystematic risk, which has no significant influence on MSC.
[44] In the study, firm-specific risk and idiosyncratic risk are used interchangeably.

estimate firm-specific risk, adding a momentum factor in line with Carhart (1997) and Fama and French (2016) for the four-factor model (FF4).

Accordingly, following Hasan and Habib (2019a), this study requires at least 175 daily observations for all the equations to be considered to calculate idiosyncratic risk, measured as the annualised standard deviation of the residuals from estimating the following equations (3.1–3.4) and total risk (3.5), as shown in Table 4.1.

Table 4.1. Equations for calculating idiosyncratic risk and total risk, the main dependent variables of the study

1	*Market model*	(3.1)
	$R_{i,t} = \alpha_i + \beta_i(R_{m,t}) + \varepsilon_{i,t}$	
2	*CAPM*	(3.2)
	$R_{i,t} - R_{f,t} = \alpha_i + \beta_i(R_{m,t} - R_{f,t)} + \varepsilon_{it}$	
3	*Fama–French (1993) model*	(3.3)
	$R_{i,t} - R_{f,t} = \alpha_{it} + \beta_i(R_{m,t} - R_{f,t}) + \beta_{is}\, SMB_t + \beta_{ih}\, HML_i + \varepsilon_{it}$	
4	*Carhart (1997) and Fama–French (2016) four-factor model*	(3.4)
	$R_{i,t} - R_{f,t} = \alpha_{it} + \beta_i(R_{m,t} - R_{f,t}) + \beta_{is}\, SMB_t + \beta_{ih}\, HML_i + \beta_{iu} UMD_i + \varepsilon_{it}$	
5	Firm's total risk	(3.5)
	where $\sigma_{Annual} =. \sigma_{Daily} * \sqrt[2]{252}$ and $\sigma_{Daily} = Ln\,(P_{t+1}/P_t)$	

where

$R_{i,t}$: stock return adjusted to dividends for firm *i* firm and time *t* (from DataStream)

α_i: intercept term

β_i: slope coefficient

$R_{f,t}$: daily return from holding a 30-day risk-free treasury bill

SMB_t: size premium (small minus big)

HML_t: value premium (high minus low)

UMD_t: premium on winners minus losers

σ_{Annual} : annualised standard deviation

σ_{Daily}: standard deviation of daily returns

$\sqrt[2]{252}$: square root of 252 days

***P*: closing share price.**

In addition, for all equations, *i* = 1,….,N and *t* = 1,…,T

4.3.3 Independent variables

Social capital is used as an independent variable. However, it has no single agreed definition, as indicated in the literature review. Accordingly, this paper follows the most relevant studies in the field to capture the social capital measure, which is defined under structural social capital. Therefore, the study focuses on social capital among agents (directors/management executives) and defines the structural social capital between agents as an asset embedded in social networks, which can be utilised from the connections between agents (Lin, 1999; Burt, 1992). Consequently, agents are considered to be highly connected if they have close connections with other agents in the network, which can be assessed through the size of the network, as determined by the DEGREE measure of the social network (Burt, 1983; Freeman, 1979). More specifically, based on the structural definition of social capital, this study defined the level of MSC as the number 'degree' of connections held by a specific agent (i.e. executive/director) of the study firms. Therefore, following (García-Feijóo et al., 2021; Fracassi, 2017; Javakhadze et al., 2016b; Horton et al., 2012), the number of connections for all agents in a specific firm was calculated to establish the firm level of social capital. First, these connections are the summation of those from current employment; two agents connected by working together in the same firm. Second, past employment was calculated in the same way as current employment, except that it was only considered if the agents worked together at any time in the past, without duplicating current employment connections. Third, the educational network was considered, according to which two agents were considered to be connected if they attended the same educational institution within a one-year overlap.[45] Finally, connections from other social activities were considered; in this case, those between two agents were deemed relevant if they had the same membership in social organisations such as football clubs, golf clubs and charities, or other social organisations at the same time. However, to ensure that the connections were effective, connections through educational networks and other social activities were only considered if the agent had connections from current or previous employment.[46] Finally, to produce the MSC variable, all the connections were aggregated

[45] Previous studies considered a two-year overlap, but for this study, a one-year overlap was a more precise measure to guarantee that people had a greater opportunity to have met than with a two-year overlap.

[46] An attempt was made to ensure that the connections could take place through current or past employment, which means that those from employment were essential to obtain the whole index value. However, people

to represent the firm level of social capital from 2006 to 2017. Moreover, this study uses MSC in different forms by taking the adjusted MSC (ADJ-MSC), in which it calculates the difference between MSC at time (t) for firm (i) and the industry average value of MSC.[47]

$$\boldsymbol{MSC_{it} = \sum_{n=1}^{i}(CEC_{it} + PEC_{it} + EDC_{it} + OSAC_{it})} \quad \text{..... (3.6)}$$

where

MSC*$_{it}$: managerial social capital for firm *i* at time *t
CEC*$_{it}$: current employment connections for firm *i* at time *t
PEC*$_{it}$: previous employment connections for firm *i* at time *t
ED*$_{it}$: connections through education for firm *i* at time *t
***OSAC*$_{it}$: other social activity connections for firm *i* at time *t*.**

4.3.4 Control variables

As previous studies recommend, this study incorporates a set of control variables in its estimation model that are associated with firms' risk-taking decisions. They control for firm size as the natural logarithm of total assets. Large firms tend to make more diversifications and are more efficient than small firms. They are also less exposed to bankruptcy. Consequently, it is expected that large firms will have low return volatility[48] (Pástor and Pietro, 2003). A firm's risk tends to decrease with the passage of time. Therefore, firm age is included as a natural logarithm of the number of years since the incorporation of the firm (Akbar et al., 2017; Cao et al., 2006). Previous studies suggest that financial leverage affects firms' risk-taking decisions, with highly leveraged firms experiencing more risk (Adams et al., 2005). Therefore, financial leverage is used as a measure as the ratio of total debt to total assets (Huang and Shang, 2019). Myers (1977) argues that asset utilisation is negatively associated with the debt ratio when firms have an

have more connections in real life through other sources, which can also affect the use of social networks. For instance, Fracassi and Tate (2012) tried to ensure that agents' connections were effective by contacting them and the social activities organisations (such as charities, clubs, and not-for-profit organisations). Moreover, BoardEx provides the size of the agent network based on the four aspects of the MSC, regardless of employment conditions, whereas this study postulates that an agent should be working on using their connections.

[47] To obtain an unbiased average, the MSC value of the focal firm was excluded from the average calculations.

[48] In this study, an attempt was made to incorporate the FTSE All-Share Index, which contains small cap firms that have more volatile returns; unfortunately, these small firms have insufficient data for the MSC variable and so were excluded from the study sample.

under-investment problem. In addition, it is expected that firms with effective resource management will generate more earnings, which implies lower risk-taking. However, Pae et al. (2018) indicate that asset turnover is not well documented in the literature and report that this factor has a positive influence on firms' risk-taking. Therefore, this study accounts for the asset turnover ratio, measured as sales to total assets (Florackis, 2008). Equally important, previous studies (e.g. Hussainey et al., 2011; Pástor and Pietro, 2003) argue that dividend distributions and high returns can reduce profit volatility. Therefore, this study uses return on assets, measured as net income to total assets and the dividends to assets ratio in the regression model. Furthermore, as suggested by Cao et al. (2006), firms' corporate risk is closely related to a firm's growth options. Therefore, this study includes Tobin's Q to control for firm growth, as measured by (Singh et al., 2018).

Moreover, the study accounts for governance variables. The primary role of BODs is to monitor management performance in the day-to-day running of the business. Previous studies provide contradictory results on the optimal board size. For instance, Pathan (2009) shows that a smaller board has a higher tendency to take risks. On the other hand, Jensen (1993) argues that due to inefficient communication and coordination problems in large boards, the decision-making process is slow and time-wasting. This implies that reaching agreement by all parties is hard to achieve. However, Cheng (2008) illustrates that firms with a large board size may be exposed to a lower degree of risk. Therefore, this study includes board size in the regression model. However, recent studies in the UK have found a negative association between board size and risk-taking decisions (Akbar et al., 2017). Some non-executive directors are on the board based on previous connections with the firm, and some are only related to the firm through their contractual relationship (Keasey et al., 2005). Therefore, this study uses the number of independent directors as measured by the ratio of the number of non-executive directors to board size. Jensen and Meckling (1976) suggest that the presence of independent directors on the board can mitigate agency conflicts. Similarly, Fama (1980) suggests that independent directors provide effective monitoring, as they are concerned about their reputation and are independent of management.

In addition, previous studies suggest that the existence of female directors on the board produces different responses to risk preferences. For instance, Beckmann and Menkhoff (2008) show that female fund managers tend to be more risk-averse than men. On the other hand, Berger et al. (2014) show that the proportion of women on the board has a positive relationship with risk. In contrast, Adams and Ferreira (2003) found that variability in stock returns was negatively associated with the proportion of women on the board. However, Sila et al. (2016) show that there is no effect of gender on equity risk-taking by firms. Therefore, this study incorporates the gender effect variable measured as the percentage of female directors on the board. Moreover, the audit committee plays a vital role in mitigating firm risk through monitoring responsibilities (Aldamen et al., 2012). Younas et al. (2019) found that audit committee quality mitigates excessive corporate risk-taking and that firms with high social capital pay less audit fees than those with low social capital. Therefore, this study uses audit committee size to control for the effect of audit on risk-taking. Finally, as recommended by Wintoki et al. (2012), the study controls for the first and second lags of the dependent variable. Details of the variables used, as well as their definitions, names, sources and measurements are provided in Table 4.2.

Table 4.2. Variables: definitions and sources

Variable	Notation	Source	Variable description	Previous studies/Code(s)
				Dependent variables
Unsystematic risk	IDO-MKT	Own calculations based on DataStream	Idiosyncratic risk volatility estimated based on the market model. See Table 4.1, Equation 3.1.	Hasan and Habib (2019a)
Unsystematic risk	IDO-CAPM	Own calculations based on DataStream	Idiosyncratic risk volatility estimated based on the market model. See Table 4.1, Equation 3.2.	Hasan and Habib (2019a)
Total risk	TRISK	Own calculations based on DataStream	Standard deviation of daily stock returns (annualised). See Table 4.1, Equation 3.5.	Panta (2020)
			Main independent variables	
Managerial social capital	MSC	Own calculations based on BoardEx	Firm aggregate connections for each board member from current employment, previous employment, education, and social activity	Fracassi and Tate (2012); Ferris et al. (2017b); own calculations
Adjusted managerial social capital	ADJ-MSC	Own calculations based on BoardEx	MSC adjusted to industry without the focal firm	Goergen et al. (2019)
				Control variables
Return on assets	ROA	DataStream	Ratio of net income to total assets (winsorised)	Homroy and Slechten (2019)/ WC18191; WC02999
Firm size	FSIZE	DataStream	Natural logarithm (total assets) (winsorised)	Huang and Shang (2019)/ WC02999
Turnover ratio	TURN	DataStream	Asset turnover measured as the ratio of annual sales to total assets (winsorised)	Singh and Davidson III (2003)/ WC01001; WC02999

Debt ratio	DEBTR	DataStream	Short-term debt and long-term debt divided by the book value of total assets (winsorised)	Huang and Shang (2019)/WC03251; WC03051; WC02999
Dividends to assets	DIVTOASS	DataStream	Total dividends (common and preferred) to total assets (winsorised)	Davaadorj (2019)/WC04551; WC02999
Tobin's Q ratio	Q	DataStream	Number of shares outstanding times stock price plus total liabilities divided by total assets (winsorised)	Singh et al. (2018)/NOSH; P; WC03251; WC03051; WC02999
Firm age	FAGE	DataStream /gov.uk	Number of years since incorporation of the firm (winsorised)	Akbar et al. (2017)/WC18273
Board size	BSIZE	BoardEx	Total number of directors sitting on the board (winsorised)	Fracassi (2017)
Board independence	NED	BoardEx	Ratio of the number of independent directors to the total number of directors (winsorised)	Akbar et al. (2017)
Audit committee size	ASIZE	BoardEx	Total number of directors sitting on the audit committee (winsorised)	Elmagrhi et al. (2017)
Female directors	GEN	BoardEx	Ratio of the number of female directors to the total number of directors (winsorised)	Chen et al. (2017b)
Industry dummy	SIC	DataStream	Dummy for each micro-sector	Phillips and Ormsby (2016)
Year dummy	YEAR		Dummy variable for each year based on the ICB (FTSE Factsheet 2018)	
				Additional variables used
Unsystematic risk	IDO-FF3	Own calculations based on DataStream	Idiosyncratic risk volatility estimated based on the market model. See Table 4.1, Equation 3.3.	Hasan and Habib (2019a)
Unsystematic risk	IDO-FF4	Own calculations based on DataStream	Idiosyncratic risk volatility estimated based on the market model. See Table 4.1, Equation 3.4.	Hasan and Habib (2019a)
Corporate social responsibility	CSR	DataStream	Environmental, social and corporate governance	Duque-Grisales and Aguilera-Caracuel (2019)/TRESGCS
Risk committee	RSKCOM	BoardEx	Risk committee represented by a dummy equal to one if the firm has a risk committee and zero otherwise	Akbar et al. (2017)

4.3.5 Descriptive statistics

Table 4.3 shows the set of variable statistics, in particular the dependent, independent and control variables based on the FTSE 350 Index, from which all firms listed during the period 2006–2017 were included to control for possible survivorship bias. The final panel dataset comprised 3,137 firm-year observations. The dependent variable was risk-taking decisions, as shown in Table 4.1, which can be total or residual risk.

For firm-specific risk, the study considered the residual value from the CAPM, symbolised as IDO-CAPM, and the market model, symbolised as IDO-MKT. Moreover, in further analysis, the residual value calculated based on Fama–French's (1993) model (IDO-FF3) and Fama–French's (2016) four-factor model (IDO-FF4) was included. The mean value of the IDO-CAPM variable is 0.29, which is the same as that of the other variables used, including the IDO-MKT, IDO-FF3 and IDO-FF4 measures. The mean value of idiosyncratic risk in the US market is not much larger than that in the UK (Chakraborty et al., 2019; Hasan and Habib, 2019a). However, the mean value for MSC is 5.04, with a standard deviation of 2.276, which is in line with the finding of (Homroy and Slechten, 2019). In addition, the ADJ-MSC mean value is 0.424, with a minimum value of −5.641 and a maximum value of 6.877. Furthermore, the control variables have different values. More specifically, ROA has average/standard deviation of 0.05/0.11, which for FSIZE is 13.64/1.88; for Q, 1.14/0.81; for turnover ratio, 0.78/0.79; for DEBTR, 0.18/0.17; for DIVTA, 0.03/.03; and for FAGE, 3.56/0.79. Moreover, the study controls for governance variables by including the BSIZE, ASIZE, NED and GEN variables, which have mean values of 2, 1.4, 0.7, and 0.13, respectively. The descriptive statistics figures align with those of previous studies (Hasan and Habib, 2019a; Homroy and Slechten, 2019; Akbar et al., 2017)

Table 4.3. The summary and descriptive statistics of the study variables used. The dataset observations are based on the FTSE 350 during the period 2006–2018. See Table 4.2 for the variable definitions and measurements.

Variables	N	Mean	SD	Percentile							Skewness	Kurtosis
				P5	P25	P50	P75	P95	Max	Min		
IDO-CAPM	4102	0.289	0.176	0.113	0.179	0.248	0.341	0.604	2.486	0.045	2.920	19.397
IDO-MKT	4102	0.289	0.176	0.113	0.179	0.248	0.341	0.604	2.486	0.045	2.920	19.397
TRISK	4102	0.325	0.179	0.147	0.214	0.284	0.380	0.662	2.488	0.054	2.796	17.735
ADJ-MSC	4241	0.424	2.480	-5.052	-0.944	0.552	2.014	4.403	6.877	-5.641	-0.360	3.200
MSC	4241	5.040	2.276	0.000	3.951	5.308	6.561	8.114	11.790	0.000	-0.607	3.337
ROA	4115	0.048	0.105	-0.118	0.013	0.050	0.095	0.203	0.300	-0.428	-1.479	8.827
FSIZE	4115	13.639	1.879	11.183	12.339	13.295	14.577	17.224	20.512	10.599	1.157	4.781
TURN	4101	0.782	0.787	0.020	0.100	0.600	1.170	2.410	3.530	-0.070	1.243	4.260
DEBTR	4115	0.187	0.165	0.000	0.050	0.157	0.280	0.521	0.720	0.000	0.971	3.588
DIVTA	4089	0.026	0.026	0.000	0.008	0.019	0.033	0.079	0.141	0.000	1.994	7.931
FAGE	4216	3.561	0.786	2.303	2.944	3.434	4.331	4.771	4.852	1.792	-0.003	1.943
Q	4109	1.144	0.811	0.275	0.731	0.907	1.328	2.759	4.976	0.075	2.274	9.644
BSIZE	3941	2.023	0.318	1.609	1.792	2.079	2.197	2.565	2.773	1.386	0.107	2.444
ASIZE	4001	1.402	0.338	1.099	1.099	1.386	1.609	1.946	2.197	0.000	-0.821	5.659
NED	3203	0.706	0.321	0.300	0.500	0.636	0.857	1.333	1.800	0.200	1.087	4.293
GEN	3941	0.130	0.121	0.000	0.000	0.130	0.200	0.330	0.500	0.000	0.679	2.952
Variables in the further analysis												
IDO-FF3	4102	0.279	0.172	0.108	0.174	0.239	0.331	0.571	2.481	0.043	3.007	20.667
IDO-FF4	4102	0.279	0.171	0.108	0.173	0.238	0.331	0.570	2.481	0.043	3.009	20.724

Table 4.4 shows the correlation matrix between the study variables. It indicates that the correlation between the variables is significant. Gujarati (2003) highlights that a collinearity problem between variables can result in a biased estimation. In particular, he states that a collinearity problem occurs when the value of the correlation between two variables is 0.80 or more. Moreover, the variance inflation factor (VIF) value is used to provide extra verification of the collinearity results. According to the rule of thumb, if the VIF value exceeds 10, this suggests a collinearity issue. Correspondingly, the reciprocal value of the VIF (i.e., the 1/VIF) or tolerance suggests that any tolerance value less than 0.10 indicates that a collinearity issue could arise. As reported in Table 4.4, the study variables are free of collinearity problems, with the highest collinearity value of 0.881, apart from the correlation between MSC and ADJ-MSC, which is used separately as a dependent variable. The correlation between board size and independent directors is 0.632. Therefore, collinearity problems have no significant effect on our estimation outcomes.

Table 4.5 presents the evolution of social capital and corporate risk-taking in the UK during the period 2006–2017.[49] As can be seen, MSC and ADJ-MSC show a declining trend during the study period; this may reflect the tendency of the firms to follow the CGC of 2010, which recommends that FTSE 350 firms do not include more than 50% of independent directors on their board. The corporate risk-taking variables (IDO-MKT, IDO-CAPM, IDO-FF3, IDO-FF4 and TRISK) have very similar values to the mean and standard deviation values; comparable outcomes were reported by Hasan and Habib (2019a) using US data.

It is notable that the highest risk mean values were reported in 2008 and 2009, which may reflect the consequences of the 2007–2009 financial crisis (Pathan, 2009). For instance, the percentage change in the IDO-CAPM variable from 2007 to 2008 is around 79%, a value that declined by around 37% from 2009 to 2010, which could be attributed to the rescue package provided by the UK government (Erkens et al., 2012). Therefore, it is clear that more attention needs to be paid to corporate risk-taking in the UK, particularly in relation to BODs ((Akbar et

[49] Shahgholian et al. (2012) discuss the evolution of social networks in the UK using the current employment dimension during the period 2000–2011.

al., 2017; Mathew et al., 2016). Risk-taking received little consideration in the UK CGC before the 2007–2009 financial crisis, but it has received more attention since then.[50]

4.4 Research methodology

In addition to the other goals of the study, the primary objective is to control for endogeneity problems that may result in a biased estimation. To illustrate this, using the dynamic model of estimation, which employs a lagged dependent variable in the regressors, a lagged variable might be correlated with the firm fixed effects; consequently, using OLS estimation could result in bias. To eliminate such bias, it is possible to apply the fixed-effects model; however, there remains the possibility of a correlation problem between the lagged variable and the transformed residuals when applying the transformed model to remove the fixed effects. Bearing this in mind, an endogeneity problem can result if the regressors are correlated with the error term; therefore, the use of OLS or the fixed effects estimator is not recommended, as they can result in a biased estimation.

Such an econometric problem can be solved by applying the dynamic panel generalised method of moments estimator (system GMM), as suggested by Arellano and Bond (1991). It has been discussed that if endogeneity exists, the application of system-GMM is a more suitable method of estimation than other estimation methods such as fixed effects estimators or OLS, which may lead to inconsistent and/or biased results (Sila et al., 2016).

Therefore, this study follows the estimation techniques used by Wintoki et al. (2012) by applying system GMM to control for any endogeneity problems that may occur, as endogeneity problems may result from several sources. The first is simultaneity, which is proposed in the study because of the concurrent use of risk-taking variables and other financial variables (e.g. the debt ratio). For instance, managers can adjust the debt level in the firm to avoid insolvency problems, but this would misrepresent their actual risk level. The second source is unobservable heterogeneity, an issue that may occur when certain omitted variables such as managerial skills and abilities affect the firm's risk-taking decisions. For instance, Adams et al. (2010) argue

[50] The UK Corporate Governance Code, 2010, section (A.1) states that ….the board's role is to provide entrepreneurial leadership of the company within a framework of prudent and effective controls which enables risk to be assessed and managed' (UK Corporate Governance Code, 2010, p.9).

that the CEO will be compensated by being a chairman as a result of good performance in the past. The third source is that another endogeneity concern may occur in the estimation, known as dynamic endogeneity. As illustrated by Wintoki et al. (2012), this source of endogeneity is usually ignored in corporate governance research, resulting in inconsistent and mixed results. Generally, the lagged dependent variable (Y_{it-1}) and the fixed effects in the error term are endogenous, which leads to a biased dynamic panel estimation. When financial variables are influenced by previous corporate risk-taking observations, dynamic endogeneity will appear in the model specifications. This positive correlation between an explanatory variable and error term results in a violated and biased OLS model and provides inconsistent results that do not align with the necessary assumptions. This is attributed to the predictive power of the model by increasing the estimator for lagged risk-taking, originally referred to as firm fixed effects.

However, applying system GMM can enable control of the three endogeneity sources and facilitate obtaining consistent results. Consequently, this study uses system GMM; by applying this model, all the regressors are used in the transformed form, with this transformation of the variables based on differencing. Additional instruments can be employed to enhance estimation efficiency. In system GMM, two equations are employed, the base and the transformed; the first set of equations is in levels, whereas the second equations set takes the first difference of the instrument variables coupled with the lagged levels of the response variable, the regressors are used as instruments, and then moment conditions jointly combined for each one, with the endogenous variables set as instruments that are lagged in difference and in levels (Roodman, 2009a; Roodman, 2006).

This method uses the dependent and independent variables as instruments by considering their lags. Therefore, this study uses lags of the response variable (risk-taking) to control the dynamic effect of previous risk-taking on current corporate risk-taking and other regressors in the model.[51]

[51] We followed Wintoki et al. (2012) to specify the appropriate number of lags that should be used in the model. We used the first and second lags of the dependent variable in the main study model and other models to obtain a sufficient number of lags to capture the dynamic effect under system GMM. Wintoki et al. (2012) report that risk-taking variables can work under one, two, or up to three lags of the dependent variable in the model.

Table 4.4. Pearson's correlations and VIF values. The table presents the correlation matrix between the study variables. See Table 4.2 for the variable definitions and measurements.

	Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	VIF	1/VIF
(1)	IDO CAPM	1													1.358	0.736
(2)	ADJ-MSC	0.115*	1												4.113	0.243
(3)	MSC	0.098*	**0.881***	1											4.18	0.239
(4)	ROA	**-0.343***	-0.048*	-0.055*	1										1.417	0.706
(5)	FSIZE	-0.153*	0.073*	0.092*	-0.003	1									1.727	0.579
(6)	TURN	**0.206***	0.051*	0.038*	0.120*	-0.171*	1								1.276	0.784
(7)	DEBTR	0.157*	0.096*	0.086*	-0.121*	0.277*	-0.03	1							1.152	0.868
(8)	DIVTA	-0.104*	-0.025	-0.061*	**0.305***	-0.092*	**0.324***	-0.007	1						1.689	0.592
(9)	FAGE	-0.095*	-0.003	-0.012	0.02	0.077*	0.018	0.055*	0.02	1					1.055	0.947
(10)	Q	-0.087*	-0.053*	-0.049*	0.324*	-0.192*	0.238*	0.012	**0.549***	-0.085*	1				1.552	0.644
(11)	BSIZE	0.057*	0.015	0.053*	-0.024	-0.017	0.077*	0.022	-0.028	-0.029	0.003	1			2.083	0.48
(12)	ASIZE	-0.053*	-0.090*	-0.069*	0.055*	-0.038*	-0.033*	-0.003	0.017	0.026	0.054*	0.213*	1		1.136	0.88
(13)	NED	-0.153*	-0.001	-0.032	0.033	**0.450***	-0.137*	0.131*	0.027	-0.003	-0.046*	**-0.632***	-0.118*	1	2.544	0.393
(14)	GEN	-0.054*	-0.161*	-0.193*	0.050*	0.070*	-0.048*	0.050*	0.037*	0.101*	0.053*	0.078*	**0.235***	0.023	1.142	0.876

Indicates significance level at 5%

Table 4.5. Evolution of UK MSC and corporate risk-taking. The table presents the mean, difference, Δ difference, and standard deviation for MSC, ADJ-MSC, IDO-MKT, IDO-CAPM, IDO-FF3, and IDO-FF4 for the UK from 2006 to 2017.

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
MSC	5.822	5.634	5.674	5.628	5.593	5.506	5.397	5.148	4.930	4.511	3.882	2.787
	-	-0.188	0.040	-0.046	-0.035	-0.087	-0.109	-0.249	-0.218	-0.419	-0.629	-1.095
		-0.032	0.007	-0.008	-0.006	-0.016	-0.020	-0.046	-0.042	-0.085	-0.139	-0.282
	1.785	1.757	1.744	1.841	1.907	2.024	2.128	2.282	2.336	2.366	2.438	2.445
ADJ-MSC	1.209	1.020	1.059	1.013	0.978	0.891	0.782	0.533	0.312	-0.108	-0.737	-1.831
	-	-0.189	0.039	-0.046	-0.035	-0.087	-0.109	-0.249	-0.221	-0.420	-0.629	-1.094
		-0.156	0.038	-0.043	-0.035	-0.089	-0.122	-0.318	-0.415	-1.346	5.824	1.484
	2.045	2.034	2.028	2.110	2.171	2.278	2.318	2.475	2.529	2.547	2.609	2.606
IDO-MKT	0.234	0.263	0.471	0.422	0.267	0.285	0.261	0.232	0.234	0.246	0.298	0.239
	-	0.029	0.208	-0.049	-0.155	0.018	-0.024	-0.029	0.002	0.012	0.052	-0.059
		0.124	0.791	-0.104	-0.367	0.067	-0.084	-0.111	0.009	0.051	0.211	-0.198
	0.090	0.125	0.207	0.216	0.130	0.171	0.200	0.107	0.112	0.145	0.167	0.181
IDO-CAPM	0.234	0.263	0.471	0.422	0.267	0.285	0.261	0.232	0.234	0.246	0.298	0.239
	-	0.029	0.208	-0.049	-0.155	0.018	-0.024	-0.029	0.002	0.012	0.052	-0.059
		0.124	0.791	-0.104	-0.367	0.067	-0.084	-0.111	0.009	0.051	0.211	-0.198
	0.090	0.125	0.207	0.216	0.130	0.171	0.200	0.107	0.112	0.145	0.167	0.181
IDO-FF3	0.226	0.256	0.451	0.407	0.261	0.278	0.255	0.227	0.227	0.240	0.278	0.233
	-	0.030	0.195	-0.044	-0.146	0.017	-0.023	-0.028	0.000	0.013	0.038	-0.045
		0.133	0.762	-0.098	-0.359	0.065	-0.083	-0.110	0.000	0.057	0.158	-0.162
	0.090	0.124	0.198	0.207	0.129	0.169	0.200	0.107	0.111	0.144	0.165	0.179
IDO-FF4	0.225	0.255	0.450	0.405	0.261	0.277	0.254	0.226	0.226	0.239	0.278	0.233
	-	0.030	0.195	-0.045	-0.144	0.016	-0.023	-0.028	0.000	0.013	0.039	-0.045
		0.133	0.765	-0.100	-0.356	0.061	-0.083	-0.110	0.000	0.058	0.163	-0.162
	0.090	0.090	0.123	0.198	0.207	0.128	0.168	0.200	0.107	0.111	0.144	0.164
TRISK	0.263	0.307	0.546	0.466	0.306	0.339	0.289	0.254	0.254	0.278	0.336	0.247
	-	0.044	0.239	-0.080	-0.160	0.033	-0.050	-0.035	0.000	0.024	0.058	-0.089
	-	0.167	0.779	-0.147	-0.343	0.108	-0.147	-0.121	0.000	0.094	0.209	-0.265
	0.086	0.121	0.205	0.222	0.123	0.163	0.196	0.100	0.105	0.138	0.164	0.178

Accordingly, the study uses all the regressor variables, which include the social capital variable, financial variables, and governance variables, as endogenous variables, apart from the year dummy, industry dummy, and firm age (Wintoki et al., 2012; Schultz et al., 2010). Therefore, to predict how social capital affects corporate risk-taking, the following estimation model was employed:

$$y_{it} = \alpha_{it} + y_{it-1} + y_{it-2} + \beta_1 SC_{it} + \beta_2 control_{it} + \theta x_{it} + \mu_i + \varepsilon_{it} \ldots\ldots\ (3.7)$$

where y_{it} is the dependent variable that can be idiosyncratic risk[52] or total risk, and y_{it-1} and y_{it-2} are the first and second lags of y_{it}, respectively. SC_{it} represents social capital, which includes MSC or the ADJ-MSC variable. $control_{it}$ represents the control variables: return on assets (ROA), leverage (DEBTR), Tobin's Q (Q), asset turnover (TURN), dividends to assets (DIVTA), firm size (FSIZE), board size (BSIZE), audit committee size (ASIZE), board independence (NED), and gender (GEN). In addition, x_{it} represents firm age (FAGE), the year dummy and industry dummy, which are treated as exogenous variables, μ_i stands for the unobserved firm effect, and ε_{it} denotes the residuals. An industry dummy was added to control for the impact of different industries, so the model was first applied without using the industry dummy and then by including it. However, system GMM has some weaknesses that can limit its estimation abilities if the model does not treat it appropriately. On one hand, the instrumental variables can result in the problem of too many instruments (Roodman, 2009b) . Therefore, it is better to add a condition to capture the proliferation of the instruments option; the 'collapse' option can treat this issue. On the other hand, using two-step GMM estimation may result in a biased outcome concerning the standard error. To deal with this issue, finite sample correction for the two-step covariance matrix can be applied, as suggested by Windmeijer (2005). Roodman (2009a) illustrates that these options result in a two-step robust GMM model with superior estimations to other models, such as one-step GMM. Consequently, this study used the 'xtabond2' instruction in the STATA program and added the 'collapse' option and robust standard error to avoid any GMM system limitations that may violate the study outcomes. In addition, since the data are unbalanced with some gaps, the 'orthogonal' option was used (Roodman, 2009a).

[52] Idiosyncratic risk was measured using the CAPM and market model. The FF3 and FF4 models were then added, which were used in the robust analysis.

In addition, application of the system GMM estimator includes two primary tests that provide helpful information to detect any misspecification. First, a test is provided for second-order autocorrelation. To obtain a reliable inference from system GMM, this should be based on an adequate number of lags in the model. As Wintoki et al. (2012) illustrate, it is expected that autocorrelation will be obtained for the first differences AR(1), but that is not allowed for the second differences AR(2) to obtain valid model specifications. Second, as the lag of past variables in more than one lag as an instrumental variable is possible, a test of overidentifying restrictions can be used to test the null hypothesis that all the instrumental variables are jointly valid (Hansen and Singleton, 1982). Consequently, the system GMM estimator has been applied to differentiate between the two sub-samples of the financial and non-financial firms.

4.5 Results and discussion

This section presents the study results after using the GMM system model to analyse the base equation. In particular, it shows the outcomes of the relationship between measures of social capital, namely MSC and the adjusted MSC, and risk-taking. In addition, this section presents the results based on the financial and non-financial firms, the role of corporate governance, and the interaction between board governance structure and MSC in determining the risk-taking. Finally, it provides the results after controlling for the existence of a risk committee.

4.5.1 MSC and corporate risk-taking

Table 4.6 presents the estimation results of the study baseline regression model; the study variables were estimated using system GMM. In Table 4.6, Model-MA, Model-MN and Model-MF represent the estimation results where the dependent variable is idiosyncratic risk measured using the market model, whereas Model-CA, Model-CN and Model-CF, use the CAPM to calculate the idiosyncratic risk. Moreover, total risk is used in Model-TA, Model-TN and Model-TF. Thus, the table contains the outcomes of three different dependent variables; the market model and CAPM represent the use of idiosyncratic risk as a risk measure, and the third dependent variable is the total risk. Thereafter, in addition to the main sample that contains all the sample firms, non-financial firms and financial firms have been incorporated to differentiate between the two situations in comparison with all firms.

Table 4.6. Relationship between MSC and idiosyncratic and total risk.
Notes: The table presents the results of the dynamic panel generalised method of moments estimators using idiosyncratic risk from the market model and CAPM in addition to total risk as a proxy of firms' risk-taking decisions. P-values are reported in parentheses. All the t-statistics are based on robust standard errors. ***, **, and * represent the level of significance at the 1%, 5%, and 10% levels, respectively. AR(1) and AR(2) represent the tests for the first-order and second-order serial correlation in the first-differenced residuals, under the null of no serial correlation. Hansen's test of overidentification is under the null that all instruments are valid. $Risk_{(t-1)}$ and $Risk_{(t-2)}$ are the first and second lags of the dependent variable, respectively. In addition, all estimations use the industry and year dummies. See Table 4.2 for the variable definitions and measurements.

Variable	Market			CAPM			Total risk		
	All	Non-fin	Fin	All	Non-fin	Fin	All	Non-fin	Fin
	Model-MA	Model-MN	Model-MF	Model-CA	Model-CN	Model-CF	Model-TA	Model-TN	Model-TF
MSC	-0.0250***	-0.0259***	-0.0109**	-0.0250***	-0.0246***	-0.0109**	-0.0319***	-0.0261***	-0.0145**
	(-2.673)	(-2.634)	(-2.193)	(-2.673)	(-2.636)	(-2.193)	(-2.680)	(-2.821)	(-2.292)
ROA	-0.500**	-0.785*	-0.175	-0.500**	-0.652*	-0.175	-0.435**	-0.763**	-0.0108
	(-2.581)	(-1.878)	(-1.135)	(-2.581)	(-1.721)	(-1.135)	(-2.066)	(-1.972)	(-0.0616)
FSIZE	0.0207	8.48e-05	0.00838	0.0207	0.00136	0.00838	0.0269*	0.0136	0.0465
	-1.356	(0.00552)	(0.491)	-1.356	(0.0901)	(0.491)	-1.781	(0.852)	(1.378)
TURN	0.0713**	0.0777*	0.0762***	0.0713**	0.0761*	0.0762***	0.0515	0.0650*	0.170***
	(2.035)	(1.945)	(3.168)	(2.035)	(1.949)	(3.168)	(1.548)	(1.673)	(2.648)
DEBTR	0.440**	0.0993	0.0580	0.440**	0.155	0.0580	0.431**	0.0764	0.425**
	(2.496)	(0.478)	(0.618)	(2.496)	(0.817)	(0.618)	(2.083)	(0.361)	(2.194)
DIVTOASS	-0.596	-0.498	-0.197	-0.596	-0.492	-0.197	-0.0509	-0.671	1.172
	(-0.705)	(-0.484)	(-0.167)	(-0.705)	(-0.485)	(-0.167)	(-0.0551)	(-0.664)	(1.198)
FAGE	-0.0114*	-0.00694	-0.0208	-0.0114*	-0.00840	-0.0208	-0.0135	-0.00607	-0.0652**
	(-1.665)	(-0.580)	(-1.271)	(-1.665)	(-0.722)	(-1.271)	(-1.488)	(-0.501)	(-2.505)
Q	0.00587	0.00332	-0.0527*	0.00587	-0.00702	-0.0527*	0.0295	-0.00130	-0.148***
	(0.216)	(0.0928)	(-1.698)	(0.216)	(-0.193)	(-1.698)	(0.704)	(-0.0315)	(-4.267)
BSIZE	-0.252**	-0.278*	-0.164*	-0.252**	-0.267*	-0.164*	-0.367***	-0.341**	-0.152
	(-2.251)	(-1.839)	(-1.662)	(-2.251)	(-1.787)	(-1.662)	(-3.126)	(-2.150)	(-1.106)
ASIZE	0.0444	-0.0184	0.0960**	0.0444	-0.0191	0.0960**	0.0281	-0.0141	0.119*
	(1.217)	(-0.352)	(2.044)	(1.217)	(-0.409)	(2.044)	(0.74)	(-0.282)	(1.776)
NED	-0.230**	-0.201**	-0.0158	-0.230**	-0.196**	-0.0158	-0.361***	-0.263***	-0.111
	(-2.377)	(-2.290)	(-0.207)	(-2.377)	(-2.244)	(-0.207)	(-2.948)	(-2.830)	(-0.906)
GEN	0.00574	-0.0816	-0.00214	0.00574	-0.0749	-0.00215	0.0359	-0.0485	0.0991
	(0.0756)	(-0.778)	(-0.0242)	(0.0756)	(-0.761)	(-0.0243)	(0.41)	(-0.481)	(0.667)
Risk(t-1)	0.476***	0.542***	0.526***	0.476***	0.544***	0.526***	0.460***	0.520***	0.429**
	(7.711)	(7.259)	(3.975)	(7.711)	(7.850)	(3.975)	(7.033)	(7.935)	(2.585)
Risk(t-2)	-0.0937**	-0.0899*	-0.124	-0.0937**	-0.131**	-0.124	-0.0649*	-0.112**	-0.217
	(-2.286)	(-1.722)	(-1.218)	(-2.286)	(-2.387)	(-1.218)	(-1.849)	(-2.024)	(-1.209)
Constant	0.529	1.014**	0.316	0.529	0.969**	0.316	0.844**	1.034**	-0.0387
	(1.533)	(2.589)	(0.876)	(1.533)	(2.543)	(0.875)	(2.274)	(2.571)	(-0.0738)
Observations	2511	1,593	918	2511	1,593	918	2513	1,593	918
Number of firms	322	203	119	322	203	119	322	203	119
F-statistic	28.04***	18.09***	16.92***	28.04***	19.84***	16.92***	31.32***	20.88***	20.51***
AR(2)	0.417	0.49	0.711	0.417	0.805	0.71	0.333	0.664	0.823
Hansen test (p-value)	0.352	0.524	0.293	0.352	0.68	0.29	0.628	0.67	0.436

Accordingly, the main models are those based on the whole firms sample (Model-MA, Model-CA and Model-TA). However, the results shown in Table 4.6 indicate that the

relationship between risk-taking and MSC is significantly negative in all the models. In other words, social connections on a firm level transfer valuable information that allows firms' management to take less risky projects. The estimation outcomes are consistent with those of (Hasan and Habib, 2019a).[53]

To illustrate this, the coefficient of MSC with risk-taking in Model-MA is −0.0250 (t = −2.673; p < 0.01), while in Model-CA, it is −0.0250 (t = −2.673; p < 0.01). These outcomes are comparable with Model-TA, which has a coefficient of −0.0319 (t = −2.680; p < 0.01). The outcomes of the three models are significantly negative at 1%. These results suggest that firms with well-connected directors have a significantly negative association with corporate risk-taking, which supports hypothesis H_1.[54]

The effect of MSC on risk-taking (i.e. idiosyncratic risk and total risk) is also economically meaningful. For example, Model-MA indicates that an increase in MSC from the 25th percentile to the 75th percentile is associated with a 0.065 (2.61*−0.025) reduction in firms' idiosyncratic risk. In addition, 2.610 is the interquartile range of MSC reported in the descriptive statistics table (6.561 − 3.951 = 2.610), and −0.025 is the coefficient estimate in Model-MA. The coefficient reported in Model-MA shows that a firm with an MSC value in the 75th percentile has lower risk exposure and is associated with 1.66 times (−0.025*6.561)/(−0.025*3.951) lower idiosyncratic risk than firms in the 25th percentile of the MSC data. In other words, an increase in MSC by one unit (i.e. using the standard deviation of ln2.276 shown in Table 4.3) would reduce idiosyncratic risk by (2.276*0.025/ln0.289 = −0.0165) 1.65% (where 0.289 is the mean value of idiosyncratic risk using the market model variable).

A previous study conducted by Hasan and Habib (2019a) used a sample of 40,152 firm-year observations from the US market for the period 1997–2017, while that of Panta (2020) used 27,929 firm-year observations during fiscal years 1992–2014. Both studies found that social capital was inversely related to firms' risk-taking. However, their results are based

[53] Following Goergen et al. (2019), the study model was re-estimated by considering the data on network size, as provided by BoardEx. The coefficients on the BoardEx network size variable have the same direction, but their statistical level of significance varies greatly across the dependent variables (for idiosyncratic risk measures and total risk measure).

[54] The main estimation of this chapter is based on the sample of all firms. However, in an unreported result, the industry dummy fixed effects have not been included and the estimates for MSC on corporate risk-taking are similar to that with industry fixed effects.

on social capital for counties; this definition is more related to the cognitive definition of social capital. Therefore, our results indicate that structural and cognitive social capital can have the same effect on firms' risk-taking. On the other hand, Ferris et al. (2017a) and Ferris et al. (2019) controlled for firms' risk-taking and CEO social capital and found that CEO social capital has a positive effect on such risk-taking. This was explained as being a good characteristic to incentivise CEOs to make less risk-averse decisions. Moreover, this study follows Fracassi and Tate (2012) by using the board corporate governance, which might be an issue in previous studies (Akbar et al., 2017).

Accordingly, this research adds to the previous research on social capital and risk-taking by considering the executives/directors of a firm to build a full overview of social capital at the firm level. Qiu et al. (2019) show that firms can benefit from the social connections of all their top management team members, not only the senior ones. However, the contrasting outcomes of previous studies may have resulted from endogeneity issues that are not considered in the use of system GMM, which deals with endogeneity issues such as those considered in this study.

Comparatively, idiosyncratic risk under Model-CA and Model-TA has the same negative effect. This indicates that the effect of total risk on MSC is closely associated with idiosyncratic risk rather than systematic risk,[55] which is in line with the explanations of Hasan and Habib (2019a). Accordingly, these results are consistent with agency theory, in which social capital works as a means of information transfer, which reduces information asymmetry, and then alleviates the agency problem by reducing agency costs. In this vein, social capital creates trust and acts as a monitoring mechanism similar to other monitoring mechanisms such as board quality, which reduces self-serving behaviour and increases penalties for misbehaviour. This is in line with the managerial reputation model, in which managers avoid risky investments because of the reputation building factor.

In addition, Table 4.6 reports the results of using two sub-samples, financial and non-financial firms. According to the results reported in the table, it is clear that different from the second and third chapters, which report that there is no effect of social capital on the firm's dividend policy and its capital structure under the financial firms, MSC and firms'

[55] The effect of MSC on systematic risk was tested in an unreported estimation, with the results proving to be insignificant.

risk-taking have a negative association under the financial and non-financial samples. This is added to the previous works, as it indicates that there is no difference between the financial and non-financial firms in relation to the association between firm's risk-taking and MSC. Accordingly, this supports hypothesis H_3, and it is consistent with the finding of a previous study by (Akbar et al., 2017).

The overall results are consistent with results of previous research, including those of (Gupta et al., 2018; Ferris et al., 2017b; Hirshleifer and Thakor, 1992). Social capital has several measurement methods, as explained by previous studies (Lins et al., 2017; Scrivens and Smith, 2013; Nahapiet and Ghoshal, 1998), which means that this topic should be further investigated in future research. Accordingly, this study includes further analyses that consider the risk measures and adjusted MSC variables. In addition, two sub-samples of financial and non-financial firms have been used in addition to the whole sample of firms. Moreover, this study uses additional evidence of the relationship between social capital and risk-taking by implementing the interaction terms between board governance variables and MSC.

In addition, by referring to the three main models (Model-MA, Model-CA and Model-TA), the regression results shown in Table 4.6 indicate that the ROA variable has a significant and positive relationship with risk-taking. This illustrates that firms with better performance and profits will incur less return volatility and, consequently, less risky investment decisions. These results are consistent with those of previous studies (Mathew et al., 2016; Cheng, 2008; Pástor and Pietro, 2003). The assets turnover variable indicates the managerial abilities to utilise the assets of the firm in a beneficial way. Therefore, the significant positive relationship reported in the study analysis indicates that management can manage its resources effectively (Florackis, 2008). However, previous studies provide limited evidence regarding the effect of assets turnover on firm risk-taking. The positive relationship that results from the specification model might relate to the fact that the more active firms are in utilising their assets effectively, the more they will be exposed to higher risk than less active firms. This positive relation between assets turnover and risk is similar to what is reported by (Pae et al., 2018). It is well documented in the corporate finance literature that more debt results in higher risk (Akbar et al., 2017; Adams et al., 2005). Therefore, the results of this study are consistent with those of previous studies on the relationship between debt and risk-taking. In addition, it is expected that mature firms will

have less volatility in their returns than younger ones and, consequently, lower risk. In addition, it was found that firm age is negatively related to return volatility, which is also consistent with previous findings (Akbar et al., 2017; Cao et al., 2006).

The other financial variables, firm size, Tobin's Q, and dividend to assets, have no significant effect on firms' risk-taking. One exception is the relationship between firm size and total risk in Model-TA, which indicates that the relationship between firm size and total risk is positive. This adds to the debate in the literature on the relationship between risk-taking and firm size (Gordon et al., 2009). However, Beasley et al. (2005) argue that firm size positively affects enterprise risk management.

Board size has a negative and significant effect on risk-taking decisions. This indicates that it is a good monitoring mechanism of risk-taking in the UK. This is consistent with the results of recent studies (Mathew et al., 2016; Pathan, 2009; Cheng, 2008). In addition, it is expected that boards with a higher percentage of non-executive directors will exhibit better monitoring functions that reduce unnecessary risk-taking decisions. Table 4.6 shows a significant and negative association between the proportion of non-executive directors and risk-taking decisions in the UK; these results are consistent with the findings of previous studies (Akbar et al., 2017; Mathew et al., 2016; Pathan, 2009).

The study finding that the proportion of females in the board has no significant effect on risk-taking decisions is consistent with that of Sila et al. (2016), who report that there is no relationship between female representation in the board and a firm's risk-taking decisions. However, this may relate to the 'tokenism effect', where the role of women in boards can be symbolic (Schwab et al., 2016).

In addition, this study found that audit committee size does not affect risk-taking decisions, although audit committee characteristics are a less developed topic in the literature, and other audit characteristics might be considered, such as social connections, meeting times, and educational background (Beasley et al., 2005). Furthermore, the first lag of the dependent variable has a positive and significant effect on the dependent variables at all levels. However, this effect is also significant in the second lag but with a negative sign.

Moreover, the validity of system GMM in this study has been confirmed through the specification tests, which prove the robustness of our model estimators. In relation to this,

Wintoki et al. (2012) argue that it is expected that the first difference AR(1) will have a serial correlation but that will not be the case in the second difference AR(2). Consistent with this, the study results indicate that there is no serial correlation in the second difference. Moreover, the Hansen test of overidentification shows that the instruments used in the study are valid.

4.5.2 Adjusted measure of MSC

In this section, an additional explanation of the association between risk-taking and social capital has been considered by using the adjusted measure of MSC. Therefore, this study provides new evidence of an aspect that has not been examined in previous research. For instance, Mizruchi (1996) emphasises that financial firms have a crucial role in social connections at the firm level. Moreover, a recent study conducted by Akbar et al. (2017) shows that the financial sector has a significant effect on the UK market when considering corporate governance and risk-taking decisions, as well as the monitoring role and reputation effect. In addition, by considering the industry-adjusted measure, this study ensures that the results are not led by a specific industry, which might be the case in previous works.

Table 4.7 shows how the sample firms are distributed in each industry and each year of the sample period. It can be seen that the highest representation is of firms in the financial sector, followed by firms in the industrial sector, at 37.66% and 23.4%, respectively. This lends support to the consideration of financial firms in social capital studies (Javakhadze et al., 2016b; Engelberg et al., 2012; Mizruchi, 1996). In addition, in comparison with the MSC mean in Table 4.3, it is evident that the mean value for each industry is close to the overall mean value of MSC (5.04), which also indicates that the study results are generalisable for all industries in the UK. Accordingly, the study prepared MSC adjusted to each industry (ADJ-MSC) without using the focal firm's observation to obtain an unbiased estimate of the alternative social capital measure (ADJ-MSC).

Therefore, the previous models (Model-MA, Model-MN, Model-MF, Model-CA, Model-CN, Model-CF, Model-TA, Model-TN and Model-TF) were estimated again by considering the ADJ-MSC variable. Consequently, it is clear that the outcomes in Table 4.8 (Model-JAM, Model-JNM, Mode-JFM, Model-JAC, Model-JNC, Model-JFC, Model-JAT, Model-JNT and Model-JFT) are not derived from the industry effect. As reported in

Table 4.8, the effect of social capital on firms' risk-taking decisions is negative and statistically significant by redefining MSC to each industry mean. The relationship is significant under the idiosyncratic risk and total risk models, as used in this study. The overall results help to draw a conclusion supporting hypothesis H_1 regarding the relationship between social capital and risk-taking and demonstrate that social capital is a determinant of firms' risk-taking.

Table 4.7. The frequency of the MSC variables for each industry in each year. The table indicates the distribution of the MSC variable each year, and the industry names and codes as reported by the ICB (FTSE Factsheet 2018). The FTSE 350 accounts for around 96% of the all-market shares in the UK market.

Industry	Code	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Frequency	Percentage	Mean
Oil & Gas	1	8	8	8	8	8	8	8	8	9	9	9	9	100	2.31%	5.40
Basic Materials	1000	13	13	13	13	13	13	13	13	13	13	13	13	156	3.61%	5.04
Industrial	2000	84	84	84	84	84	84	84	84	85	85	85	85	1012	23.40%	5.32
Consumer Goods	3000	28	28	28	28	28	28	28	28	28	28	28	28	336	7.77%	5.13
Healthcare	4000	11	11	11	11	11	11	11	11	11	11	11	11	132	3.05%	5.38
Consumer Services	5000	54	54	54	54	54	54	54	54	54	54	54	54	648	14.98%	4.46
Telecommunications	6000	4	4	4	4	4	4	4	4	4	4	4	4	48	1.11%	4.77
Utilities	7000	5	5	5	5	5	5	5	5	5	5	5	5	60	1.39%	4.74
Financial	8000	134	135	136	136	136	136	136	136	136	136	136	136	1629	37.66%	4.74
Technology	9000	17	17	17	17	17	17	17	17	17	17	17	17	204	4.72%	5.07
Observations		358	359	360	360	360	360	360	360	362	362	362	362	4325	2.31%	5.00

Table 4.8. Relationship between Industry ADJ-MSC and idiosyncratic and total risk

Notes: The table presents the results of the dynamic panel generalised method of moments estimators using idiosyncratic risk from the market model and CAPM, in addition to total risk as a proxy of firms' risk-taking decisions. P-values are reported in parentheses. All the *t*-statistics are based on robust standard errors. ***, **, and * represent levels of significance of 1%, 5%, and 10%, respectively. AR(1) and AR(2) represent the tests for the first-order and second-order serial correlation in the first-differenced residuals, under the null of no serial correlation. Hansen's test of overidentification is under the null that all instruments are valid. Risk(t-1) and Risk(t-2) are the first and second lags of the dependent variable, respectively. In addition, all estimations use the industry and year dummies. See Table 4.2 for the variable definitions and measurements.

	Market			CAPM			Total Risk		
	All	Non-fin	Fin	All	Non-fin	Fin	All	Non-fin	Fin
Variable	Model-JAM	Model-JNM	Mode-JFM	Model-JAC	Model-JNC	Model-JFC	Model-JAT	Model-JNT	Model-JFT
ADJ-MSC	-0.0247***	-0.0254***	-0.0124**	-0.0247***	-0.0241***	-0.0109**	-0.0330***	-0.0235**	-0.0144**
	(-2.682)	(-2.640)	(-2.292)	(-2.682)	(-2.621)	(-2.193)	(-2.911)	(-2.595)	(-2.292)
ROA	-0.513***	-0.787*	-0.203	-0.513***	-0.656*	-0.175	-0.338*	-0.653*	-0.0111
	(-2.713)	(-1.887)	(-1.323)	(-2.713)	(-1.735)	(-1.137)	(-1.890)	(-1.708)	(-0.0633)
FSIZE	0.0218	0.000331	0.00873	0.0218	0.00151	0.00842	0.0309**	0.0147	0.0465
	-1.424	(0.0215)	(0.443)	-1.424	(0.100)	(0.493)	-2.206	(0.897)	(1.379)
TURN	0.0717**	0.0785*	0.0968***	0.0717**	0.0768*	0.0763***	0.0581	0.0654*	0.170***
	-2.081	(1.953)	(2.636)	-2.081	(1.953)	(3.168)	-1.558	(1.690)	(2.647)
DEBTR	0.445**	0.0955	0.116	0.445**	0.150	0.0582	0.473**	0.126	0.425**
	-2.501	(0.460)	(0.728)	-2.501	(0.793)	(0.620)	-2.582	(0.595)	(2.194)
DIVTA	-0.526	-0.483	-0.368	-0.526	-0.477	-0.196	-0.615	-1.013	1.173
	(-0.624)	(-0.472)	(-0.276)	(-0.624)	(-0.471)	(-0.166)	(-0.596)	(-0.911)	(1.200)
FAGE	-0.0109	-0.00644	-0.0278	-0.0109	-0.00793	-0.0208	-0.0171*	-0.00573	-0.0652**
	(-1.620)	(-0.537)	(-1.568)	(-1.620)	(-0.680)	(-1.271)	(-1.960)	(-0.475)	(-2.504)
Q	0.00836	0.00284	-0.0716**	0.00836	-0.00744	-0.0528*	0.00387	-0.00257	-0.148***
	-0.318	(0.0794)	(-1.991)	-0.318	(-0.205)	(-1.699)	-0.0733	(-0.0615)	(-4.268)
BSIZE	-0.231*	-0.276*	-0.203*	-0.231*	-0.265*	-0.164*	-0.343**	-0.370**	-0.152
	(-1.939)	(-1.835)	(-1.857)	(-1.939)	(-1.777)	(-1.663)	(-2.400)	(-2.071)	(-1.107)
ASIZE	0.0443	-0.0184	0.101*	0.0443	-0.0191	0.0960**	0.0458	-0.00514	0.119*
	-1.148	(-0.356)	(1.842)	-1.148	(-0.411)	(2.043)	-1.373	(-0.0947)	(1.776)
NED	-0.212**	-0.201**	-0.0428	-0.212**	-0.195**	-0.0158	-0.321**	-0.271***	-0.111
	(-2.131)	(-2.291)	(-0.474)	(-2.131)	(-2.237)	(-0.207)	(-2.130)	(-2.704)	(-0.906)
GEN	-0.00797	-0.0834	0.0136	-0.00797	-0.0767	-0.00215	0.024	-0.0537	0.0990
	(-0.101)	(-0.796)	(0.145)	(-0.101)	(-0.778)	(-0.0242)	-0.273	(-0.474)	(0.667)
$Risk_{(t-1)}$	0.479***	0.541***	0.462***	0.479***	0.543***	0.526***	0.474***	0.510***	0.429**
	-8.144	(7.264)	(3.148)	-8.144	(7.848)	(3.972)	-7.699	(7.741)	(2.585)
$Risk_{(t-2)}$	-0.0926**	-0.0896*	-0.157	-0.0926**	-0.130**	-0.124	-0.0558	-0.117**	-0.217
	(-2.259)	(-1.719)	(-1.377)	(-2.259)	(-2.375)	(-1.217)	(-1.538)	(-2.082)	(-1.209)
Constant	0.311	0.867**	0.397	0.311	0.829**	0.261	0.449	0.945**	-0.112
	-0.825	(2.245)	(0.882)	-0.825	(2.228)	(0.712)	-1.154	(2.261)	(-0.212)
Observations	2,511	1,593	918	2,511	1,593	918	2,513	1,593	918
Number of boardid	322	203	119	322	203	119	322	203	119
F-statistic	28.5***	18.13***	15.61***	28.5***	19.91***	16.93***	43.9	21.24***	20.51***
AR (2)	0.414	0.491	0.833	0.414	0.804	0.711	0.304	0.691	0.823
Hansen test (p-value)	0.38	0.529	0.373	0.38	0.682	0.294	0.224	0.637	0.436
Industry FE	yes			Yes			Yes		
Year FE	yes			Yes			Yes		

In addition, similar to the results in Table 4.6, the results in Table 4.7 show that the three samples of all firms, non-financial firms, and financial firms report a significant negative relationship between social capital and risk-taking, which is consistent with the three

hypotheses of this chapter, namely H_1, H_2 and H_3. Accordingly, the study adds to previous corporate finance studies by providing new evidence of the significance of non-financial factors in determining firms' risk-taking policy.

4.5.3 Further analysis

To add more robust results to the main analyses, further explanations have been added. Accordingly, additional regressions have been added to consider the use of additional measures of risk-taking, specifically, the FF3 and FF4 models. In addition, the risk committee variable has been incorporated into the estimation model to ensure that the main result is not affected by the omitted variable problem. Moreover, due to the importance of board structure governance variables, additional explanations are used by implementing the interaction effect of MSC and governance variables.

FF3 and FF4

Carhart (1997) argues that Small Minus Big (SMB) and High Minus Low (HML) are linked with the mean of market capitalisation and book-to-market equity, which might cause some variations in the risk calculations by introducing the FF3 model. Thereafter, in FF4, Up-Minus-Down (UMD) or 'winner minus loser' factor was added to capture the momentum effect. Gregory et al. (2013) examined the use of the FF3 and FF4 models in addition to the market model and the CAPM in the UK market by using data of the largest 350 firms.

Consequently, in addition to the main analysis, (Hasan and Habib, 2019a) and (John et al., 2008) clarify that idiosyncratic volatility encompasses the highest amount of risk assigned for a specific stock. Therefore, Hasan and Habib (2019a) extensively investigated its relationship with social capital by adding FF3 and FF4 as an additional idiosyncratic risk measure. Following Hasan and Habib (2019a), this study tested the social capital variables, namely MSC and ADJ-MSC, in relation to the FF3 and FF4 models, the results of which are reported in Table 4.9.[56] These results, which are based on the whole sample of firms, provide very similar outcomes to those in Table 4.6 and Table 4.8. Therefore, our estimation of the effect of social capital on risk-taking decisions is not subject to limited risk measures but is also robust under several risk specifications.

[56] In unreported estimations, the industry effect was removed, and the results were similar to the results reported in Table 4.9.

Table 4.9. Relationship between idiosyncratic risk and social capital.

Notes: The table presents the results of the dynamic panel generalised method of moments estimators using idiosyncratic risk from the FF3 model and FF4 model. P-values are reported in parentheses. All the *t*-statistics are based on robust standard errors. ***, **, and * represent levels of significance of 1%, 5%, and 10%, respectively. AR(2) represents the test for the second-order serial correlation in the first-differenced residuals under the null of no serial correlation. Hansen's test of overidentification is under the null that all instruments are valid. Risk(t-1) and Risk(t-2) are the first and second lags of the dependent variable, respectively. See Table 4.2 for the variable definitions and measurements.

Variable	Panel A: Relationship between idiosyncratic risk and ADJ-MSC		Panel B: Relationship between idiosyncratic risk and MSC	
	FF3	FF4	FF3	FF4
MSC			-0.0246***	-0.0246***
			(-2.664)	(-2.668)
ADJ-MSC	-0.0239***	-0.0238***		
	(-2.598)	(-2.592)		
ROA	-0.513***	-0.510***	-0.499**	-0.497**
	(-2.697)	(-2.694)	(-2.556)	(-2.555)
FSIZE	0.0189	0.0185	0.018	0.0177
	(1.305)	(1.278)	(1.258)	(1.233)
TURN	0.0686**	0.0689**	0.0687**	0.0690**
	(2.081)	(2.086)	(2.036)	(2.042)
DEBTR	0.429**	0.426**	0.426**	0.423**
	(2.447)	(2.435)	(2.466)	(2.455)
DIVTOASS	-0.667	-0.693	-0.707	-0.732
	(-0.813)	(-0.846)	(-0.860)	(-0.891)
FAGE	-0.0102	-0.0101	-0.0108*	-0.0107
	(-1.602)	(-1.590)	(-1.658)	(-1.646)
Q	0.0131	0.0133	0.0108	0.0109
	(0.514)	(0.523)	(0.415)	(0.423)
BSIZE	-0.231**	-0.231**	-0.251**	-0.251**
	(-1.993)	(-2.005)	(-2.319)	(-2.334)
ASIZE	0.0448	0.0451	0.0451	0.0454
	(1.167)	(1.174)	(1.249)	(1.26)
NED	-0.202**	-0.200**	-0.221**	-0.219**
	(-2.066)	(-2.053)	(-2.334)	(-2.328)
GEN	-0.00555	-0.00527	0.00762	0.00785
	(-0.0719)	(-0.0685)	-0.103	-0.106
Risk(t-1)	0.494***	0.492***	0.491***	0.490***
	(8.178)	(8.126)	(7.79)	(7.745)
Risk(t-2)	-0.0877**	-0.0884**	-0.0888**	-0.0895**
	(-2.023)	(-2.031)	(-2.041)	(-2.048)
Constant	0.348	0.353	0.556*	0.560*
	(0.952)	(0.971)	(1.69)	(1.718)
Observations	2511	2511	2511	2511
Number of boardid	322	322	322	322
F-statistic	29.3***	29.21***	28.85***	28.75***
AR (2)	0.349	0.365	0.354	0.369
Hansen test (p-value)	0.308	0.29	0.298	0.28
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

Bearing this in mind, the use of system GMM allows for control of the endogeneity concern. Accordingly, the relationship across all models was tested using system GMM, meaning that the size, sign and level of significance of these estimates were not biased and free of serial correlation with the error term (ε). In addition, it is not logical to find reverse causality between social capital and risk-taking decisions, as the formation of social connections predates the risk-taking proxies (Ferris et al., 2019). However, system GMM eliminates any sceptical concerns regarding such reverse causality and deals with the problem of omitted variables. Nevertheless, Wintoki et al. (2012) argue that omitted variables might exist, and therefore this study used the risk committee as an additional control variable in its estimation.

Risk committee

It has been argued that the risk committee is responsible for setting risk management policies and monitoring their implementation, which should enhance monitoring, as the committee is independent of the BOD (Iselin, 2020). As social capital plays a monitoring role, as discussed previously in the literature, it is expected that as the risk committee also has a disciplinary role, this might affect the social capital firms. In the study estimation to test the social capital effect on corporate risk-taking, an additional variable that is relevant to risk-taking decisions is used, namely the existence of a risk committee. The role of such a committee is vital with respect to risk-taking decisions made by BOD members (Iselin, 2020; Akbar et al., 2017). Following Akbar et al. (2017), this study uses a dummy variable equal to one if the firm has a risk committee on its board and zero otherwise. The related information was extracted from the BoardEx database. The estimation results are reported in Table 4.10. The results indicate that the effects of social capital under MSC and ADJ-MSC are similar and comparable to our baseline regression analysis findings.[57]

Accordingly, the relationship between the risk committee and risk-taking decisions is positive in Models I, II, III and IV, and this relationship is significant in Models II and III at the 10% and 5% levels, respectively. These outcomes are similar to those in the recent study conducted by Akbar et al. (2017) in the UK. The results can be explained from two perspectives. First, risk committee members are experts in the field, so firms can gain a better understanding

[57] In unreported estimations, it was found that the relationship remained similar with the use of the market models FF3 and FF4.

Table 4.10. Effect of social capital on firms' risk-taking incorporating risk committee

Notes: The table presents the results of the dynamic panel generalised method of moments estimators using idiosyncratic risk from the market model and CAPM, in addition to total risk as a proxy of firms' risk-taking decisions. P-values are reported in parentheses. All the *t*-statistics are based on robust standard errors. ***, **, and * represent levels of significance of 1%, 5%, and 10%, respectively. AR(2) represents the test for the second-order serial correlation in the first-differenced residuals, under the null of no serial correlation. Hansen's test of overidentification is under the null that all the instruments are valid. Risk(t-1) and Risk(t-2) are the first and second lags of the dependent variable, respectively. All models use industry and year fixed effects .See Table 4.2 for the variable definitions and measurements.

Variable	IDIO_CAPM		Total_RISK	
	I	II	III	IV
MSC	-0.0232**		-0.0302**	
	(-2.412)		(-2.446)	
ADJ-MSC		-0.0261**		-0.0369***
		(-2.545)		(-3.119)
ROA	-0.568***	-0.591***	-0.575**	-0.378*
	(-2.822)	(-3.031)	(-2.131)	(-1.906)
FSIZE	0.0248	0.025	0.00751	0.0323**
	-1.524	-1.498	-0.452	-2.299
TURN	0.0648*	0.0690**	0.0356	0.0597*
	(1.806)	(2.257)	(1.16)	(1.927)
DEBTR	0.346**	0.402**	0.204	0.376**
	(1.986)	(2.195)	(1.194)	(2.134)
DIVTA	-0.773	-0.442	-0.901	-1.198
	(-0.892)	(-0.460)	(-0.868)	(-1.217)
FAGE	-0.0033	-0.00687	0.0041	-0.0108
	(-0.433)	(-0.855)	-0.354	(-1.024)
Q	0.0249	0.0138	0.0667	0.0445
	(0.88)	(0.48)	(1.374)	(0.786)
BSIZE	-0.292***	-0.236*	-0.362**	-0.365**
	(-2.665)	(-1.895)	(-2.397)	(-2.037)
ASIZE	0.0502	0.0537	-0.0463	0.0548*
	(1.287)	(1.318)	(-0.761)	(1.68)
NED	-0.241**	-0.197*	-0.295**	-0.335**
	(-2.417)	(-1.855)	(-2.381)	(-2.055)
GEN	0.000179	-0.0404	-0.00219	-0.0247
	(0.00235)	(-0.510)	(-0.0249)	(-0.293)
RSKCOM	0.134	0.135*	0.129**	0.0866
	(1.649)	(1.733)	(2.001)	(1.16)
$Risk_{(t-1)}$	0.494***	0.497***	0.489***	0.489***
	(8.156)	(8.491)	(8.486)	(7.846)
$Risk_{(t-2)}$	-0.0789*	-0.0722*	-0.0624*	-0.0562
	(-1.916)	(-1.754)	(-1.837)	(-1.582)
Constant	0.524	0.204	1.137**	0.429
	(1.481)	(0.554)	(2.341)	(0.981)
Observations	2,511	2,512	2,513	2,513
Number of firms	322	322	322	322
F-statistic	27.01***	32.49***	31.96***	40.19***
AR (2)	0.295	0.286	0.188	0.268
Hansen test (p-value)	0.329	0.469	0.679	0.13

of risk and assess the consequences in a better position than others that do not have such experts. Therefore, unnecessary risks will be excluded, but risky projects that are not related to excessive risk-taking will not be considered, whereas chances will be taken over necessary risks. Second, firms that have a risk committee attempt to express their position of supporting shareholder benefits, so they show less concern for conflicts of interest and other related agency issues. Therefore, managers become less risk-averse and accept risky investment decisions with a positive NPV to enhance the shareholders' wealth maximisation goal. Moreover, the risk committee effect is controlled by several factors in the model, particularly social capital, which can also be added to the explanations of this relationship by adding more support to the second point, which emphasises the monitoring effect. In other words, the existence of a risk committee and a good level of social capital will support the monitoring function of the board. These outcomes emphasise the significant functions of the risk committee on the boards of UK firms and lend support to regulations that seek to incorporate risk committees in UK firms. These findings were also estimated using system GMM.

Corporate governance

Importantly, previous studies confirm that corporate governance has a significant effect in studying social capital, specifically in relation to financial decisions (Oyotode-Adebile and Ujah, 2021; Hasan et al., 2020; Fracassi and Tate, 2012). Therefore, it is expected that the board governance structure will impact the relationship between risk-taking and social capital. Accordingly, this study extends the use of board governance structure as a control variable by introducing the interaction effect between the MSC and board corporate governance variables as a determinant of the firm's risk-taking decision.

Table 4.11 presents the results of using the interaction between the MSC and board governance structure in relation to the firm's risk-taking. Notably, the reported evidence generally indicates that interaction variables in all models are negative, which is similar to the results of the baseline regression. However, the interaction variables will be compared with Model-MA in Table 4.5. The result of the interaction between board size and MSC is significant and negative, which is consistent with hypothesis H_1, and this may relate to the level of asymmetric information, where in addition to the role of MSC in reducing asymmetric information, large board size is expected to have the same role. To emphasise this, as reported in Model-MA in Table 4.5, $t = -2.673$; $p < 0.01$, compared to the BMSC model where $t = -2.871$; $p < 0.01$; this means that board size moderates the effect of MSC on the firm's risk-taking. However, the

negative effect of MSC*NED on risk-taking is significant at the 10% level compared to the effect of NED in Model-MA. This is still in line with hypothesis H_1, and that adds to the argument on the role of the independent directors in relation to their ability to bring more social ties to the firm (Mizruchi, 1996).

Table 4.11. Additional analyses of the effect of MSC on firm's risk-taking.
Notes: This table reports the association between MSC and risk-taking based on the interactions between MSC and corporate governance variables (MSC*BSIZE, MSC*NED, MSC*ASIZE, and MSC*GEN). The outcomes are based on results of the dynamic panel generalised method of moments estimators using idiosyncratic risk from the market model as a proxy of firms' risk-taking decisions. All the *t*-statistics are based on robust standard errors. ***, **, and * represent the level of significance at 1%, 5%, and 10%, respectively. AR(1) and AR(2) represent the tests for the first-order and second-order serial correlation in the first-differenced residuals, under the null of no serial correlation. Hansen's test of overidentification is under the null that all instruments are valid. $Risk_{(t-1)}$ and $Risk_{(t-2)}$ are the first and second lags of the dependent variable, respectively. See Table 4.2 for the variable definitions and measurements.

VARIABLES	Market model			
	BMSC	NMSC	AMSC	GMSC
MSC*BSIZE	-0.00109***			
	(-2.871)			
MSC*NED		-0.0147*		
		(-1.935)		
MSC*ASIZE			-0.000958	
			(-1.500)	
MSC*GEN				-0.0218**
				(-2.106)
ROA	-0.463***	-0.438**	-0.313***	-0.270***
	(-2.690)	(-2.239)	(-3.278)	(-2.923)
FSIZE	0.000621	-0.0183*	-0.00761*	-0.00675
	(0.0839)	(-1.747)	(-1.667)	(-1.257)
TURN	0.0426*	0.0953*	0.0380***	0.0439***
	(1.694)	(1.753)	(2.975)	(3.308)
DEBTR	-0.0172	-0.134	0.0392	0.0232
	(-0.116)	(-0.388)	(0.623)	(0.362)
DIVTOASS	-0.486	-2.279*	0.183	0.0939
	(-0.505)	(-1.699)	(0.440)	(0.218)
FAGE	5.59e-05	-0.00427	-0.00456	-0.00448
	(0.00954)	(-0.428)	(-1.058)	(-0.975)
Q	0.0224	0.00286	-0.00701	-0.00947
	(1.003)	(0.0760)	(-0.777)	(-0.868)
$Dep_{(t-1)}$	0.7804	0.259	0.600***	0.641***
	(3.43)	(1.095)	(7.882)	(7.217)
$Dep_{(t-2)}$	-0.0227	-0.0114	-0.128***	-0.158***
	(-0.178)	(-0.0824)	(-2.913)	(-3.002)
Constant	0.0357	0.514***	0.459***	0.440***
	(0.266)	(2.717)	(5.819)	(4.928)
Observations	2,513	2,513	2,567	2,513
Number of boardid	322	322	326	322
F-statistic	44.19***	20.39***	66.27***	60.86***
AR1	0.03	0.179	0	0
AR2	0.309	0.351	0.853	0.859
Hansen test (p-value)	0.74	0.295	0.346	0.201

Moreover, MSC*ASIZE has no significant effect, which is also the case in Model-MA. On the other hand, the effect of MSC*GEN is negative at the 5% significance level. This means that socially connected women have a significant role in relation to risk-taking. Importantly, recent studies conducted by (Oyotode-Adebile and Ujah, 2021) and (Afzali et al., 2021) show that social capital on a county level is a determinant of gender representation in the board. Accordingly, the result of this chapter provides a novel contribution on the role of gender diversity in the board and its relationship with social capital, which also means that more investigations should be conducted on this aspect, especially in relation to structural social capital.[58]

Consequently, the overall results provide evidence of the ability of social capital to alleviate the agency problem, support society, and increase a firm's ability to take the necessary risks that have a positive NPV while at the same time avoiding projects that may harm the relationship between management and shareholders. In this regard, this study calls for further investigations into distinguishing between the micro level and the macro level of social capital building in relation to financial decisions and policies. For instance, firm's image and the social media effect might be considered in future research from different dimensions of social capital. However, this is outside the scope of this study, which focuses on social capital and risk-taking decisions. Moreover, this study adds to the recent evidence that suggests integrating agency theory and RDT when considering social capital and firm performance (Zona et al., 2018; Hillman and Dalziel, 2003).

4.6 Conclusions and implications

Social capital is considered to be a determinant of firms' financial decisions in modern corporations. This study provides new evidence of the relationship between social capital and corporate risk-taking in the UK market. The analysis is based on FTSE 350 constituent firms; to ensure robust analysis, all firms in the index during the period 2006–2017 were included. The analysis yielded several interesting findings. First, it was found that social capital affects corporate risk-taking in several ways. In this regard, it was demonstrated that MSC has a negative impact on corporate risk-taking; this is similar to the findings of previous studies that consider the cognitive dimension of social capital (Panta, 2020; Hasan and Habib, 2019a).

[58] In an unreported result, when each governance variable was considered separately, the ASIZE variable had a significantly negative impact on risk-taking. However, the role of the audit committee needs further investigation in relation to social capital (Bhandari et al., 2018).

Second, due care was paid to endogeneity issues in the empirical estimation using system GMM statistical methods. Therefore, the results of the study are robust to alternative measures of social capital and risk-taking, and endogeneity issues are dealt with by implementing system GMM. In addition, the effect of social capital on corporate risk-taking in the UK does not show large variation across industries. Moreover, the study results are based on a very dynamic era that encompasses corporate governance changes and the financial crisis in 2007–2009. This study shows that MSC has a negative effect on risk-taking, which is not the case in studies conducted in the US. Therefore, future studies could use an international sample that can provide a better insight into the effect of social capital on a firm's risk-taking decision in different markets. Furthermore, the results of this chapter are based on the social capital at the firm level; therefore, they provide a better insight into the role of social capital in a firm's risk-taking. Previous works paid more attention to the CEO level of social capital, which affects the generalisability of results.

In addition, the results of this chapter are based on three types of samples, namely all firms, non-financial firms, and financial firms. Indeed, the results indicate no difference between financial and non-financial firms, and this can help those who are interested in the difference between the two samples. Moreover, it is recommended that future works should focus on providing a better insight into the difference between financial and non-financial firms, particularly in relation to MSC as it is affected by people from financial firms. Moreover, this chapter uses additional risk-taking measures, which ensures the generalisability of the outcomes, and an interaction between the board corporate governance variables and MSC has been used to provide a better insight into the role of corporate governance. The results show that board governance variables have been significantly affected by MSC; therefore, it is recommended that corporate governance bodies should give more consideration to the social connections in relation to risk-taking.

Finally, the regression outcomes are based on a robust result, as this chapter deals with the risk committee variable, which does not affect the nature of the main relationship between social capital and corporate risk-taking, although the relationship is significantly positive in two of the estimations that used the variable. Such a positive relationship emphasises the role of the risk committee in supporting shareholders' wealth maximisation. The research results are therefore aligned with the agency theory point of view, which seeks to include a risk committee in UK firms.

Overall, the analysis also indicates that structural social capital at the firm level (executives' and directors' connections) alleviates corporate risk-taking, which is consistent with the findings of previous studies on the reputation and monitoring hypotheses (Hirshleifer, 1993; Fama and Jensen, 1983; Fama, 1980). These results provide the theoretical rationale for how social capital could work as a determinant of corporate risk-taking.

Regarding the role of corporate governance, the study findings would be relevant to decision makers in financial markets, as well as to other regulatory bodies concerned with improving the future of governance codes and their objectives, to have better control over expected risks. Therefore, our study findings would be useful for UK regulators and those in other countries to safeguard against risk-related decisions in the future, which can be achieved by employing highly connected directors. In particular, regarding the role of social capital and female directors in relation to risk-taking, the interaction effect between female directors and MSC is significant, which highlights that social connections between female directors have an important effect that should not be ignored by future studies and other interested stakeholders. Additionally, regarding the interaction between the board size and MSC, the relationship is significantly negative, and this could be related to the role of reducing asymmetric information by the large boards and the high degree of social connections.

The study findings demonstrate the importance of social capital as an effective mechanism for monitoring and reducing the effect of agency problems between management and other stakeholders. A higher number of social ties held by board members could therefore lead to better monitoring, ensuring that managerial interests are aligned with shareholders' interests, which can be achieved by encouraging managers to make decisions that will result in shareholders' value maximisation.

The study has some limitations. First, it covers the effect of social capital on corporate risk-taking by considering several risk measures and social capital indications. However, other variables, such as ownership structure, the quality of education of board members, ethnicity, and political connections, are not considered. Future investigations could add to the analysis by controlling for these and other factors, thus offering a further insight for this stream of literature. Second, using a more extended sample period could provide further support to the findings and future CGCs. Furthermore, the nature of social capital has seen significant and dynamic changes, particularly in abnormal situations such as crises and scarcity of resources, so it would be worth considering this variable under uncertain conditions, such as the COVID-

19 pandemic. In addition, this study uses a quantitative method; however, using a qualitative research study such as ethnographic research could provide more insights into understanding the link between social capital and risk-taking. Moreover, no data are available for a social capital index similar to those of Putnam and Hofstede in the US, although the OECD has started to report data based on the UK and Euro countries, which could be used in future research. Finally, social capital is not a limited concept, and it needs to be studied under a wider scope of different countries to capture its cultural aspects and other factors such as religious effects. All these possibilities will provide more opportunities for future research to reveal the uncovered aspects of the effect of social capital on financial decisions.

CHAPTER FIVE CONCLUSION

5.1 Introduction and key findings

This chapter presents a summary of key findings according to the aims and research questions related to social capital and three corporate finance decisions namely, dividend policy, capital structure, and corporate risk-taking. Thereafter, it discusses the findings and how they may help in improving the current knowledge and the applicability of these findings. Finally, a review of the study limitations and some recommendations that might be considered in future research, are presented.

Chapter two argued that managerial social capital (MSC) is a determinant of a firm's dividend policy. Accordingly, the attributes of social capital provide an efficient channel of information transfer, alleviate information asymmetry, and then reduce the agency costs, as this leads to better firm performance. Consistent with the substitution model, the findings show that the MSC attributes have a negative and significant effect on the firm's dividend policy (La Porta et al., 2000). Importantly, the findings indicate that corporate governance is critical in studying social capital and dividends policy, which is related to common attributes between corporate governance and social capital that reduce agency cost, such as the monitoring function (Ferris et al., 2017b; Rozeff, 1982). Moreover, under the financial firms' sample, this chapter reports that MSC has no significant effect on dividend policy. Finally, this chapter shows that it can be helpful for policymakers in the UK to include the Higgs Report (2003) in considerations, which views board directors as a mechanism of value creation, whereas this is not the case in the US (Jiraporn et al., 2009).

Chapter three provides empirical evidence of the relationship between social capital and a firm's capital structure. Accordingly, consistent with the outcome hypothesis (La Porta et al., 2000), which expects a positive relationship between strong monitoring and the use of debt, and in line with pecking order theory, the existence of social capital can alleviate the level of information asymmetry, permitting firms to use debt instead of equity, which results in the mitigation of financing costs (García and Herrero, 2021; Myers, 2003). Accordingly, this chapter reports that MSC has a significant and positive influence on the firm's capital structure. These findings add to the argument on the role of non-financial factors as determinants of capital structure (Aggarwal and Goodell, 2014a). In addition, the chapter emphasises that social

capital is a multidimensional concept that can differ in different places. Subsequently, the difference between the outcomes of this chapter and those of the previous work in the US by (Huang and Shang, 2019) is explained, and the chapter calls for further investigations that can provide a better insight into the dimensions of social capital and capital structure (Lins et al., 2017). Moreover, this chapter shows that MSC mitigates information asymmetry (Tuugi et al., 2014), and all the outcomes are based on a robust analysis that uses proxies of social capital and two measures of firm's capital structure. Furthermore, similar to chapter two, this chapter compares three types of samples, namely all firms, non-financial firms, and financial firms. The non-financial firms provide a similar result to the sample of all firms, but under the financial firms, the results indicate no significant effect between social capital and capital structure. Overall, the findings emphasise the important role of friends with money (Fan et al., 2019; Engelberg et al., 2012).

Chapter four responds to the outcomes in chapters two and three by providing evidence of the ability of social capital to reduce the ambiguity that results in a dilution of the uncertainty surrounding business activities. The findings indicate a significantly negative relationship between MSC and corporate risk-taking, which is explained under the agency theory and the reputation and monitoring hypotheses (Hirshleifer, 1993; Fama and Jensen, 1983; Fama, 1980). In the same vein, results align with those of previous studies that relate risk-taking to the cognitive dimension of social capital (Panta, 2020; Hasan and Habib, 2019a). However, the results are different from those of the US studies, which aim to study the Chief Executive officers' (CEOs) social capital and corporate risk-taking. Accordingly, using a wider sample that encompasses a global level of social capital can enhance existing knowledge by verifying how social capital can act in relation to risk-taking based on different societies. Furthermore, the results emphasise that the US setting is different from the UK under studies of this type. Interestingly, this chapter follows the same procedures as chapters two and three by generating two additional samples from the whole sample of firms based on the financial and non-financial firms. However, different from the previous two chapters, the financial firms' sample agrees with non-financial firms and all the sample firms by reporting a negative association between corporate risk-taking and MSC. This emphasises the argument regarding the vital role played by financial firms in constructing social capital.

Moreover, chapter four provides an additional analysis of the interaction between board corporate governance variables and MSC in determining corporate risk-taking. Importantly, the interaction of MSC with the female representation in the board and board size indicates that

the role of social capital in relation to risk-taking can be improved under a strong governance regime. Furthermore, additional robust analyses have been employed by using FF3 and FF4 as alternatives for the risk-taking variables and the existence of a risk committee in the firm to deal with the omitted variables problem. Overall, the results in the additional analysis confirm the results of the baseline regression and indicate that social capital results in shareholders' value maximisation.

This thesis has argued that the role of socio-economic factors is significant in corporate finance. Nevertheless, the role of social capital in corporate finance has not received adequate attention, which impacts numerous stakeholders, such as prospective investors, shareholders, policymakers, and other interested parties. Consequently, this thesis includes three interrelated research questions that link social capital and corporate financial decisions. Generally, this thesis reports that social capital measured by social networks capital, namely MSC, is a determinant of corporate financing decisions, particularly the dividend policy, capital structure, and risk-taking.

Consequently, this thesis contributes to the extant literature in several ways. First, the results in chapter two are valuable for those who are interested in investing and care about the dividend policy followed by the firm. For example, those who are interested in capital gain and growth investments, and not in quick liquidity taken as dividend distribution, can invest in firms with high social capital levels. Moreover, such investments are supposed to be well monitored by socially connected firms, which is also related to a solid internal corporate governance mechanism. Accordingly, regulators and those who are in charge of the issuance of Corporate governance codes (CGCs) may benefit from these results; for example, the results imply that directors with good connections have better monitoring and advisory roles.

Second, in chapter three, the findings indicate that coupled with its attribute in mitigating asymmetric information, MSC can enhance the ability of socially connected firms (through the connections of directors/executives) to obtain more funds, which increases the capital structure of the firm. Indeed, these are crucial results, as they may suggest that socially connected firms can invest in a profitable project. Importantly, these implications in the second chapter were not validated without questioning the relationship between social capital and risk-taking. To illustrate this, it is well known that increasing the level of debt in the firm's capital structure can lead to bankruptcy or insolvency, and consequently, that means a higher level of risk; therefore, the results in chapter three confirm that social capital alleviates risk-taking.

Therefore, chapters two and three suggest that MSC can be seen as a good way of money utilisation which uses more debt to the limit, and that does not allow a more unnecessary level of risk-taking. Moreover, a positive association between MSC and capital structure is seen as an outcome of a good corporate governance regime, which means a better monitoring system. Accordingly, chapters two and three emphasise the role of MSC in alleviating the consequences of the agency problem in UK firms.

Third, in chapter four, this thesis shows that MSC can effectively mitigate risk-taking. Accordingly, different from previous studies that focus on the CEOs' social capital and/or social capital based on the geographic and demographic characteristics, this study argues that the firm level of social capital is vital in determining risk-taking decisions. This would be relevant to those who work to establish and improve future corporate governance regulations. In addition, the interactions between MSC and board corporate governance have been considered to provide a better insight into the role of corporate governance in modelling the relationship between risk-taking and social capital, as this aspect has not received sufficient attention in previous studies. However, in chapter four, the findings show that in general, corporate governance variables are important in shaping the relationship between social capital and risk-taking. Notably, this relationship increases after it interacts with the board size. Moreover, the role of female directors becomes significant after the interaction with MSC. This is not only important for corporate governance regulators but also a significant finding, as recent studies found no relationship between gender diversity and corporate risk-taking (e.g.,Sila et al., 2016). Accordingly, the results of this chapter are not only important for chapter four but also provide strong confirmation of the results in chapters two and three by verifying the positive impact of MSC as a good monitoring tool that enhances the reputation of the firm, and then seeing social capital as a valuable factor that enriches firms' performance as a result in the whole thesis. Nevertheless, this is not the outcome of many works in the US, where social capital is treated as a value-destroying factor.

Overall, this thesis indicates that having a good understanding of the effect of MSC on corporate financial decisions could help in improving the performance of the firms. In addition, it shows that board corporate governance is associated with MSC, and then with its relationship with financial decisions. Moreover, this thesis extends its aims by responding to the calls related to the expected differences between financial and non-financial firms by investigating social capital in relation to financial decisions. Accordingly, the reported results show that using the sample of all firms and the non-financial firms produce similar results; conversely,

although the sample of financial firms shows no significant effect of MSC on the dividend policy or capital structure, for risk-taking, financial firms report results that are consistent with those of all firms and non-financial firms. Consequently, more investigations should be conducted in the future to enhance our understanding of the influence of socio-economic factors in corporate finance studies, and importantly, with careful consideration of the differences between financial and non-financial firms, in addition to the role of corporate governance in shaping these relationships in the corporate finance field.

5.2 Study limitations

The study is based on continuous and systematic reviews by professional supervisors and the contributions of several reviewers from conferences and workshops. Therefore, many efforts have been made in writing the thesis. Nevertheless, the work has some limitations. Accordingly, the study findings should be considered and explained with awareness of these potential limitations. They can be grouped into two categories: sample and data considerations, and methodological and theoretical considerations.

Sample and data considerations

Using data from the UK, this thesis analyses the influence of social capital on three financial decisions: dividend policy, capital structure, and risk-taking. The data were collected from different sources. For instance, the corporate governance variables and structural social capital variables were extracted from the BoardEx database, whereas the financial data were collected from the DataStream database. However, using BoardEx is not easy, as it is necessary to collect the data manually, and it contains a huge number of observations, from which one must trace the connectivity for each person. Therefore, collecting data from BoardEx requires effort, and it is necessary to employ programming using the R program and Excel. This may increase the possibility of marginal errors during the data collection process. Although BoardEx provides a specific variable called network size, this study followed previous research by calculating MSC to obtain precise results (e.g., Fracassi, 2017; Javakhadze et al., 2016b; Fracassi and Tate, 2012). An attempt was made to consider the FTSE All-Share Index; however, BoardEx provides data for the biggest UK firms, which limits the study sample. To illustrate this, in the initial study sample, BoardEx covered less than 50% of the FTSE All-Share Index, whereas the FTSE 350 represented more than 80% of the covered data. The FTSE 350 was therefore employed to provide an accurate representation of the sample used.

The study considers some control variables based on the previous studies. However, other variables and interactions can be used to examine these influences. For instance, ownership structure may affect the relationships examined in the three essays (García-Feijóo et al., 2021). This variable has not been considered due to the lack of data availability and access to Thomson One Banker.[59] Nevertheless, based on previous works, it can be argued that the variables used in this thesis encompass the most important determinants of each specified variable in the three essays. In addition, social networks can be created through social media, but for this thesis, the study sample has no data about connections from social media, meaning that it is difficult to consider some of the connections (Van Dijck, 2013). Fracassi and Tate (2012) argue that the data available on BoardEx cover specific connections, but in the real world, there are more channels of connections, which means that considering these should result in the same outcomes.

Methodological, theoretical and empirical considerations

This study uses social capital to achieve the aims of each essay. Indeed, it has been argued that the measures of social network centrality provide different aspects for the networks (Wasserman and Faust, 1994). For example, the degree centrality that is implemented in this study to calculate the structural dimension of social capital is based on the number of connections held by a specific agent in the social network. However, other measures can be implemented, such as the closeness measure, the betweenness measure, and the eigenvector. Generally, these three measures have been commonly used in the literature that examines the social capital of the CEO or Chief Financial officer (CFO) (Fogel et al., 2018; El-Khatib et al., 2015). In this study, structural social capital is the primary variable, and it is measured at the firm level rather than the individual level, as it has been argued that the degree measure is a good proxy for social capital at the firm level (Javakhadze et al., 2016b). Moreover, cognitive social capital can be implemented in similar studies; data can be gathered through the Organisation for Economic Co-operation and Development (OECD), but the data need further development, and this is not similar to the US where the data are available about different states and for a considerable time. In addition, the study attempted to account for social capital based on the location of the firm, but that was not applicable, as in the UK market most firms are in London. In addition, to consider this measure, I contacted the National Health Service to seek data related to blood donation, which might help to construct an indicator on the social capital

[59] It is much appreciated that Kent Business School bought the data from BoardEx after I asked for these data to be obtained. This was expensive, and it took some time to obtain these data.

in the cognitive dimension; however, after six months, I was informed that because of the workload resulting from the COVID-19 pandemic, these data are not available.

This study uses quantitative research methods. Therefore, a qualitative method in the form of interviews with the executives/managers to examine the topics of the thesis would have been relevant to obtain more information on the perceptions of their social capital and that of other stakeholders, such as investors, policymakers, and society. In addition, using interviews to collect information can consider additional characteristics that could affect social capital, such as masculinity-femininity values (Hoi et al., 2019). Accordingly, using a qualitative approach may add to the evidence by supporting the reliability and validity of the findings, thus making a significant contribution to our knowledge of this field.

Another limitation that should be considered is the identification of the empirical and theoretical outcomes of the study. Therefore, readers should be aware of the hypotheses, divergent theories, and techniques in the field, since the current differences in social capital have been developed over time, which means that it is not logical to rely on a specific theory to explain social capital in relation to financial decisions. Accordingly, the results of the thesis should be explained in light of the discussed theories, which limits the generalisability of the results. Generally, the thesis interprets the results through agency theory and/or resource dependence theory, but this does not mean that it provides a comprehensive evaluation of the role of social capital in financial decisions. Therefore, significant efforts should be made to control these limitations by following the paths indicated by the relevant studies and the reliability of the evidence provided in them. Equally important, some of the results of this study are consistent with the governance rules, which also emphasises that the findings are relevant and consistent with previous contributions.

5.2 Directions for future research

Overall, the results of this thesis demonstrate that social capital should be considered in future studies as a determinant of corporate financial decisions such as dividend policy, capital structure, and corporate risk-taking. They also indicate that regulatory bodies in the UK should reconsider Higgs (2003) to improve the performance of UK firms. Moreover, future research into capital structure should not ignore the role of social capital in affecting UK firms' capital structure decisions, since we show in chapter three that MSC is important for firms' access to finance. As the thesis uses a quantitative research method, future research could employ qualitative research methods to expand our understanding of the nature of social capital. In

addition, future studies could incorporate more countries to compare the different social capital effects on financial decisions. The social capital definition needs further development, which can result in varying results based on the variations between societies.

Furthermore, the results of the study are based on the structural social capital dimension. However, social capital measures still need to be developed, particularly in business studies. Consequently, future changes, such as those to society and business environments brought about by the COVID-19 pandemic, may affect the association between social capital and financial decisions in profound and unexpected ways, including in relation to corporate risk-taking and other strategic firm decisions. The thesis is based on a single country setting, that of the UK, where social capital is particularly important. To avoid identification issues that plague cross-country studies, worldwide evidence could provide more insights into how the social capital concept differs according to different societies and institutional environments. For instance, it is already known from previous studies that social capital can represent a very valuable resource in difficult conditions. Therefore, future research could consider such a concept in relation to the COVID-19 pandemic.

Additionally, in terms of data on social capital, as more data hopefully become available in the future, social capital data for the UK and other OECD countries could be combined to construct a new scale of the social capital variable comparable to that of Putnam and Hofstede for the US (Putnam, 2000; Gregory, 1980). Therefore, it is recommended that those in charge take a serious step and try to support a data bank that can advance the knowledge of the role of social capital in our lives. Furthermore, research support can contribute to enhancing data about social capital and its measures. In this regard, this thesis acknowledges the considerable efforts made by the World Bank to advance our knowledge of the role of social capital in our lives.[60] For instance, the World Bank provides published research on social capital, data, projects and funds, and other tools. Accordingly, this thesis recommends that future works should benefit from the available data and seek more coordination between academia and other global organisations such as the World Bank and the International Monetary Fund.

[60] A search on the World Bank website for the term ‘social capital’ yielded in more than 50,000 uses, and a search for the term ‘social networks’ yielded more than 180,000 uses. (https://www.worldbank.org/en/home)

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