MCS package and entrepreneurial competency influence on business performance: the moderating role of business strategy

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Abstract

Purpose – This paper draws on resource-based theory (RBV) to examine the impact of the management control system (MCS) package on business performance through the mediating role of entrepreneurial competencies and the interaction role of business strategy in small and medium-sized enterprises (SMEs).

Design/methodology/approach – A total of 372 questionnaires were used in this research for analysis purposes using partial least square–structural equation modelling. Cluster sampling was used and nine states out of 16 states were selected randomly, including Kelantan, Johor, Sarawak, Selangor, Kedah, Kuala Lumpur, Penang, Perak and Sabah, because the nine states cover 84.4% of the total SMEs.

Findings – The results revealed that only cultural and administrative control has no relationship with business performance. Moreover, in the MCS package, all elements have a significant and positive influence on entrepreneurial competencies. Furthermore, business strategy (cost leadership and differentiation strategy) significantly moderates, while entrepreneurial competencies mediate between, cultural, planning, cybernetic, rewards and compensation, administrative control and business performance.

Originality/value – SMEs in Malaysia are contributing 36.6% to gross domestic product. Further, as this sector is important, less attention has been paid to this area of MCS package with business strategies to determine organisational performance. This study fills these gaps, and the recommendations and findings for further research are discussed in detail accordingly. Moreover, the findings of the current research provide guidelines for the management of SMEs.

Keywords MCS package, Entrepreneurial competency, Cost leadership strategy, Differentiation strategy, Business performance, RBV theory

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1. Introduction

In a turbulent business environment, which is characterised by fierce global competition and changes in supply and demand, small and medium-sized enterprises (SMEs) exert an extraordinary amount of influence on the economies of many countries through their contribution to the national income (GDP), especially in emerging economies (Bruque and Moyano, 2007; Elrehail *et al.*, 2018). To survive within the existing marketplace, organisations must endure many issues regarding management control systems (MCS), all of which have a significant influence on business performance (Rehman *et al.*, 2019a). For example, issues pertain to cultural control, planning control, rewards and compensation control, financial issues, cybernetic control, administrative control and issues regarding strategic capabilities influence on business performance. Business performance refers to the achievement of organisational objectives that are compulsory for the survival of the organisation, consisting of financial performance and non-financial performance (Rehman *et al.*, 2019a). According to Jamil and Mohamed (2011), the MCS is very important for the growth of an organisation, and it gives confidence to the top management to cut their concentration on processes that can control by exception and provide essential information. MCS is considered an essential part of top management responsibilities (Rehman *et al.*, 2019a). Nowadays, MCS is important for business environments, and it has a substantial impact on business performance (Rehman *et al.*, 2019a). Moreover, MCS is a major resource that helps top management in their decision-making and has an influence on business performance (Agbejule, 2011).

There are two different views: MC as a system and MCS as a package (Grabner and Moers, 2013). The term "package" used by Otley (1980) means separate elements of overall MCS. On the one hand, MC practices build a system; these practices are interdependent, and design choices take these interdependencies into account (Grabner and Moers, 2013). On the other hand, the MCS package signifies a complete set of control practices into one bundle, apart from if these practices are interdependent. In other words, the MCS package consists of MC systems and/or various interdependent MC practices that address isolated control problems (Grabner and Moers, 2013). Most of the prior researchers use MCS in isolation and ignore the MCS package to measure performance in developed economies and focus less on emerging economies (Rehman *et al.*, 2019a). Further, the results of the aforementioned studies are not comprehensive enough for developing countries, for system theory reveals that different countries apply different business systems, and the findings of the developed nations cannot be applied in developing countries without additional validation (Goyal *et al.*, 2013). One of the recent studies suggested that there is a need to work on MCS and the performance of an organisation in countries that are developing in nature, as the current situation ignores them (Rehman *et al.*, 2019a). An individual country is considered as a boundary condition and can play an important role in determining results (Busse *et al.*, 2017). The majority of the firms in Malaysia are micro: that is, 76.5% of overall SMEs. Most of the researchers work with MCS in large-scale organisations, and less attention has been paid towards SMEs, especially at the micro-level. The current research focusses on micro-, small- and medium-sized organisations. These organisations vary from large organisations in terms of finance, machinery and investment. Hence, this study was conducted in a developing country to see more generalised findings.

Entrepreneurial competencies consider an important resource for an organisation and play a crucial role in the enhancement of organisational performance. Literature reveals that an organisation's performance suffers due to a lack of entrepreneurial competencies (Ahmad, 2007; Tehseen and Ramayah, 2015). As such, there is a need to focus on entrepreneurial competencies in determining business performance. This study used ethical competencies and strategic competencies to measure entrepreneurial competencies. Strategic competencies refer to an entrepreneur's ability to set, assess and implement strategies for achieving business success, while ethical competencies indicate their ability to work with ambiguity

and sincerity and acknowledge their mistakes by speaking truly. Barney and Arikan (2001) conclude that the resource-based view (RBV) ignores business strategy, as it plays a crucial role in determining business performance. Firms that have a desire to compete in the existing market, then, should focus on business strategy (cost leadership and differentiation strategy), for it allows them to take advantage of their group of resources and gain a competitive advantage (Sirmon *et al.*, 2011). The strategy has a significant influence over the control systems design in various ways, depending on which class of strategy is used (Otley, 2016). The decisions regarding strategies facilitate management to foresee the outer business environment, while valuable strategies allow management to access and utilise significant resources to achieve a competitive advantage. SMEs are considered to play an important role in the development of a country, and this sector is regarded as the backbone of Asian economies (Yoshino *et al.*, 2016). Some significant information about SMEs in Malaysia is presented in Table 1.

Malaysian SMEs face challenges regarding business strategy, entrepreneurial competencies and MCS that significantly have an influence on business performance (Tehseen *et al.*, 2018). This is the pioneer study that determines SMEs' performance with the help of MCS as a package, entrepreneurial competencies, differentiation strategy and cost leadership strategy.

Business performance has much importance when it comes to the failure or success of any kind of enterprise (Rehman *et al.*, 2019a). For example, organisations showing higher performance in the market become successful, while those that show less performance end up failing. Business performance is widely understood as financial, operational and organisational effectiveness (Venkatraman and Ramanujam, 1986). Literature reveals that directly relating MCS with (business) performance is a difficult task; further, the results of such research are hard to interpret (Janka and Guenther, 2018). Hence, this study measures organisational performance through the MCS package, not directly but indirectly, by using entrepreneurial competencies and business strategy. Business performance plays a vital role in the continued existence of profit, as well as non-profit businesses (Abu-Jarad *et al.*, 2010). In the current research, we focus on the financial and non-financial performance to measure business performance. In this research, the RBV enlightens the theoretical framework, which consists of culture, planning, cybernetic and compensation, administrative control, entrepreneurial competencies, business strategies and business performance. These are the research objectives of the study:

(1) To determine the relationship between the MCS package (cultural control, planning control, cybernetic control, rewards and compensation control and administrative control) and entrepreneurial competency.

Total number of SMEs in Malaysia	907,065
SMEs in Malaysia	97.3%
Contribution to GDP	36.6%
Micro	76.5%
Small	21.2%
Medium	2.3%
Services	89.2%
Manufacturing	5.3%
Construction	4.3%
Agriculture	1.1%
Mining and quarrying	0.1%

Source(s): SMEinfo (2018)

Table 1.
SMEs' information (why SMEs matter in Malaysia)

(2) To determine the relationship between entrepreneurial competency and business performance.

(3) To determine the relationship between business strategy and business performance.

(4) To examine whether business strategies significantly moderate between entrepreneurial competency and business performance.

(5) To examine whether entrepreneurial competency considerably mediates between MCS package (cultural control, planning control, cybernetic control, rewards and compensation control and administrative control) and business performance.

The researchers measure the organisational performance of large textile organisations in Pakistan through the MCS package (Rehman *et al.*, 2019a). Entrepreneurial competencies are used to measure SMEs' performances (Tehseen and Ramayah, 2015). Moreover, business strategies reasonably determine the performance of restaurants (Kankam-Kwarteng *et al.*, 2019). Moreover, managers/owners of SMEs can use the MCS package, entrepreneurial competency, leadership strategy and differentiation strategy to improve the business performance of Malaysian SMEs. Our study has several research contributions and implications. For instance, it is a pioneer study that builds a research model to incorporate the MCS package, entrepreneurial competency, cost leadership strategy, differentiation strategy and business performance based on RBV theory that prior researchers have ignored.

2. Literature review and hypotheses development

2.1 Resource-based view (RBV) theory

The RBV theory in the literature of strategic management has become a significant framework since 1991 (Barney *et al.*, 2001). RBV conceptualises organisations as a package of resources; after, these resources are used to put into practice, value-creating strategies (Eisenhardt and Martin, 2000) jointly with capabilities create a relationship between organisational resources and allow their strategic deployment (Day, 1994). RBV emphasises organisational resources as basic determinants of competitive advantage and business performance (Barney, 1991). The MCS package considers the most important inner resources that facilitate top management in the decision-making, in order to enhance business performance (Rehman *et al.*, 2019a). Moreover, entrepreneurial competencies are also considered to be important resources for organisations that help to enhance organisational performance (Tehseen *et al.*, 2019). Entrepreneurial competencies considered the entrepreneurial capabilities for SMEs, and they facilitate organisations in acquiring, employing and developing organisation resources successfully that, in turn, leads to improved business performance (Mitchelmore and Rowley, 2010). Therefore, our study focusses on the MCS package (internal resources) and entrepreneurial competencies (organisational capabilities) in determining business performance. Moreover, Barney and Arikan (2001) stated that the RBV theory ignores business strategy in determining business performance, as it plays a crucial role in determining business performance. This study used business strategies (cost leadership and differentiation strategy) to measure business performance and attempts to cover this gap.

2.2 Cultural control

Culture means a set of shared values (loyalty, honesty, a lack of discrimination and diligence), beliefs, symbols, attitudes, habits, behaviours, rituals, norms, philosophies, assumptions, practices and characteristics that a firm uses to attain a sustained competitive advantage (Rehman *et al.*, 2019b). Malmi and Brown (2008) divided cultural control into three parts: clans,

symbol-based and value-based. Sometimes, in the organisations, their employees control culture instead of management. There are sub-divided cultures within an organisation called clans. Within an organisation, there are different sub-cultures. Some prior researchers, including Clegg *et al.* (2015), give support to this argument. Likewise, in the organisation, different small cultures or sub-cultures exist called clans (Malmi and Brown, 2008). Clans have an impact on the behaviour of employees and help in the attainment of organisational objectives (Singh, 2008). Moreover, clan control plays an important role in organisations when managers confuse individual and business performance (Singh, 2008). Symbol-based control means a kind of culture that shows in visual forms, such as specific offices design and unique workers' uniforms within the organisation (Malmi and Brown, 2008). The organisations can express symbol-based culture in developing the particular design of buildings and particular workers' dress code. Value-based culture means a set of definitions that are officially shared in the organisation, from top management to their subordinates. Literature reveals that cultural controls are considered a major factor in examining organisational performance (Maina, 2016). Besides, cultural control is deemed to be a significant inside resource for an organisation that facilitates management in the decision-making that, in turn, influences business performance (Nikpour, 2017). Cultural control cannot be ignored in determining SMEs business performance, for the culture is considered a vital resource that determines entrepreneurial competencies and business performance (Sajilan and Tehseen, 2015). The following is the proposed hypothesis of the current study:

H1. Cultural control influences entrepreneurial competency.

2.3 Planning control

According to Rehman *et al.* (2019a), planning control plays a vital role in organisations and is considered the most significant tool for top management. Furthermore, planning control includes two types of planning schemes, short-term planning and long-term planning, which are beneficial for both SMEs and large enterprises (Rehman *et al.*, 2019a). On the one hand, short-term or action planning is a type of planning that focusses on short-term targets, and it is also called tactical focus planning (Malmi and Brown, 2008). On the other hand, long-term planning mainly focusses on strategic goals, and it is also known as strategic planning (Malmi and Brown, 2008). Literature reveals that planning controls should be a part of the organisation's internal resources in determining business performance (Ali, 2017). The entrepreneur should have a skill that is both analytical and strategic when it comes to planning (Ahmad *et al.*, 2018). This is a pioneer study that measures the influence of planning control on entrepreneurial competencies. The proposed hypothesis of the current study is as follows:

H2. Planning control influences entrepreneurial competency.

2.4 Cybernetic control

Cybernetic control is a system that measures standardised performance and system performance. The comparison is completed between both real performance and with standardised ones, and response provides information on differences (Fisher, 1998). Cybernetic control systems consist of four systems: budget, financial measurement systems, non-financial measurement systems and a balanced scorecard. In this research, we use these four elements to measure cybernetic control. Budget is a crucial indicator within an organisation. Indeed, top management uses it for communicating and coordinating the strategic priorities, and the organisation uses this budget for low-level management priorities. Top management uses financial measurement systems to set a target for their organisation, and financial measurement systems include return on investment and added economic value (Malmi and Brown, 2008). Non-financial measurement systems are considered to be important

for an organisation, as they overcome various ignoring elements of financial measurement systems, such as the quality of products, its relationship with suppliers and customers, market share and new product development (Malmi and Brown, 2008). Hybrid control systems or balanced scorecard is the mixture of both financial and non-financial (Rehman *et al.*, 2019a). Prior researchers paid inadequate attention to cybernetic controls and organisational performance, as few of the studies revealed any budgets (Pimpong and Laryea, 2016). Financial and non-financial measurement systems (Mutai, 2015) are significant factors in examining the business performance. Furthermore, the researchers suggest that cybernetic controls should be considered when it comes to measuring business performance (Rehman *et al.*, 2019a). Few of the studies on cybernetic controls were conducted to measure organisational capabilities in large organisations (Rehman *et al.*, 2018, 2019a); however, researchers ignored cybernetic control in determining entrepreneurial competencies in both SMEs and large organisations. This pioneer study measures cybernetic control influence on entrepreneurial competencies. This is the study's proposed hypothesis:

H3. Cybernetic control influences entrepreneurial competency.

2.5 Rewards and compensation control

A rewards and compensation control system (aka an incentive system) enhances the workers' performance within an organisation (Rehman *et al.*, 2019a). There are two types of rewards: tangible and intangible rewards. In the field of accounting, marketing, management, entrepreneurship and finance, researchers paid more attention to tangible rewards; however, intangible rewards cannot be ignored in order to maintain the performance and achieve a constant competitive advantage (Alatailat *et al.*, 2019; Taamneh *et al.*, 2018). Rehman *et al.* (2019) explained that rewards and compensation packages motivate organisational workers and increase their performance, enabling them to achieve organisational objectives. Moreover, individuals within an organisation work harder in case organisations pay rewards and compensation packages. Yet, they cut their efforts when they do not receive rewards and compensation packages for their hard work. This study focusses on both tangible and intangible rewards. Rewards and compensation control is considered a crucial factor that helps to enhance organisational performance (Rehman *et al.*, 2018, 2019a). Literature reveals that rewards and compensation control should be considered in measuring the performance of all types of businesses, either on a small scale or on a large scale (Rehman *et al.*, 2019a). Prior studies concluded that rewards and compensation control is a vital factor when it comes to examining firms' capabilities, but inadequate attention has been paid on rewards and compensation control in measuring entrepreneurial competencies (Rehman *et al.*, 2018, 2019a). This is a pioneer study that measures the influence of rewards and compensation control on entrepreneurial competencies. The following is the study's proposed hypothesis:

H4. Rewards and compensation influence entrepreneurial competency.

2.6 Administrative control

Administrative control refers to the clear management control system that is used within the organisation to direct the behaviour of managers or agents when it comes to the achievement of a firm's objectives. Further, it consists of structure and policy framework. In the current study, we focus on three parts of administrative control: enterprise design and structure, governance structure and policies and procedures (Malmi and Brown, 2008). One of the recent study's researchers measured administrative controls through organisational design and structure, policies and procedures and governance structure (Rehman *et al.*, 2019a). Organisation design is considered an essential control device, and management uses this to build a certain type of relationships and contacts. Organisational structure functions through the functional

specialisations and contributes to control by minimising the unpredictability of actions, while the outcome enhances its certainty (Flamholtz, 1983). Governance structure relates to the organisation's board structure and its composition, as well as different management and project teams (Malmi and Brown, 2008). Policies and procedures are an approach used to specify processes, as well as behaviours, within the organisation. Administrative control consists of three elements. The first element is organisational structure and design, the second is the governance structure, while the third is policies and procedures. Some prior studies demonstrated that there is a major and positive impact of organisational structure and design, governance structure and policies and procedures on business performance (Rehman *et al.*, 2019a). Administrative control is considered to be the most important resource for organisations in determining organisational capabilities and performance, but researchers have paid less attention to administrative control in measuring entrepreneurial competencies. This is the proposed hypothesis of this study:

H5. Administrative control influences entrepreneurial competency.

2.7 Entrepreneurial competency

Entrepreneurial competency is the skills of an entrepreneur and a combination of some competencies, such as self-esteem, particular knowledge regarding jobs, traits and social, managerial and networking competencies, that help to enhance organisational performance. Mitchelmore and Rowley (2013) stated that entrepreneurial competencies include a particular group of traits that ensure successful entrepreneurship. Literature reveals that entrepreneurial competencies are associated with the growth and sustainability of organisations (Sajilan and Tehseen, 2015). This research indicates the influence of entrepreneurial competencies on SMEs' business performances. The researchers have recognised various dimensions of entrepreneurial competencies in different sectors. For instance, ethical competencies, opportunity competencies, learning competencies, strategic competencies, conceptual competencies, leadership, management, personal competencies marketing and relationship competencies (Ahmad, 2007; Tehseen *et al.*, 2019). The researchers suggested measuring particular competencies across various industries and sizes in order to improve the generalisability of the competency model (Ahmad *et al.*, 2011). Less attention has been paid to ethical competencies and strategic competencies. Therefore, this study focusses on these two dimensions of entrepreneurial competencies to determine the business performance of SMEs. Strategic competencies refer to an entrepreneur's ability to set, assess and implement strategies to achieve business success (Rahman and Ramli, 2014). Ethical competencies refer to the ability of an entrepreneur to work with ambiguity and sincerity and acknowledge their mistakes by speaking truly. Literature shows that entrepreneurial competencies are considered to be the most important resource for organisations and should therefore be included when it comes to determining business performance (Tehseen and Ramayah, 2015). In prior studies, the researchers focussed on organisational capabilities, but individual competency has not been explored in light of the MCS package to measure business performance. The current study, however, fills this gap. It uses both strategic and ethical competency to measure entrepreneurial competencies, because an entrepreneur with only a strong strategic mind cannot perform well forever, as there is also a need for strong ethical competency to enhance business performance in the long run. The following is the proposed hypothesis for the study:

H6. Entrepreneurial competency influences business performance.

2.8 Business strategies

Business strategy is the set of decisions and actions that management uses to achieve better organisational performance compared to their market rivals (Parthasarthy, 2007, p. 7).

Organisational-level strategies play an important role in explaining the variations in organisational profitability and long-term performance. Theories regarding strategic typologies have emerged as a significant research area in the field of strategic management (Anwar and Hasnu, 2016). Business strategies have some typologies that include a set of generic strategies, such as differentiation strategy, cost leadership strategy and focus strategy (Porter, 1980); strategic types, such as prospectors' strategy, analysers' strategy, defender strategy and reactor strategy (Miles and Snow, 1978); high performance "gestalts," such as salesmen, craftsmen, pioneers and builders (Miller, 1992); and three strategic types, such as customer intimacy, product leadership and operational excellence (Treacy and Wiersema, 1995).

This study used Porter's model of business strategies due to its recognition, well-defined structure, simplicity, clarity, generality and the way it set off two other approaches for the analysis purpose at the aggregative level (Ormanidhi and Stringa, 2008). In this study, we use two major typologies of business strategies: cost leadership strategy and differentiation strategy. This study ignored focussed strategy, as it is most appropriate for those organisations that aim to cover niche markets. Cost leadership strategy consists of a group of activities that management performs, especially producing goods or services at a lower cost than their rivals, specifically to attain a sustainable competitive advantage and superior performance (Adaileh *et al.*, 2020; Harazneh *et al.*, 2020). Moreover, literature concludes that cost leadership strategy is considered an important resource in determining an organisation's performance (Kankam-Kwarteng *et al.*, 2019). Differentiation strategy refers to a group of activities that management performs, such as producing goods or services, in order to differentiate from a competitor, but at the same cost, therefore enabling them to achieve a long-term competitive advantage and higher performance. The literature demonstrates that the differentiation strategy can significantly and positively influence a firm's performance (Teeratansirikool *et al.*, 2013). Also, earlier studies conclude that business strategy plays a crucial role in examining the business performance (Parnell, 2010). Sirmon *et al.* (2011) suggested that business strategy can enhance the relationship between capabilities and business performance. These are the proposed hypotheses of this study:

H7. Cost leadership significantly influences business performance.

H8. Differentiation strategy significantly influences business performance.

H9. Differentiation strategy significantly moderates between entrepreneurial competency and business performance.

H10. Cost leadership strategy significantly moderates between entrepreneurial competency and business performance.

In prior studies, MCS significantly and positively enhanced business performance (Uyar and Kuzey, 2016). Despite this, the literature reveals that MCS has mixed results with a firm's performance (Rehman *et al.*, 2019a). As the above study mentioned, there are inconclusive results between MCS and performance, so there is a need to study this relationship further, with the addition of another variable. According to Barney (1991), organisational resources play an important role in enhancing business performance. Entrepreneurial competency considers a significant resource for an organisation, and it can enhance business performance (Tehseen *et al.*, 2019). Entrepreneurial competency (strategic competency, ethical competency) is used as a mediating variable, as it has a significant influence on business performance and can enlighten the association between MCS and business performance. The following are the proposed hypotheses of the current study:

H11–15. Entrepreneurial competencies mediate between (1) cultural control, planning control, cybernetic control, rewards and compensation control and administrative control and (2) business performance.

3. Methodology

In order to see the nature, research problem and research objective in this study, we used a cross-sectional design and correlational design to fulfil the research objectives. Our study used a survey technique and questionnaires distributed among managers/owners of SMEs in Malaysia to collect data. This study measured constructs reflectively. Prior researchers also used a survey technique to collect data. For instance, the MCS package and organisational performance (Rehman *et al.*, 2019a), entrepreneurial competency, business performance (Tehseen and Ramayah, 2015) and business strategy and business performance (Kankam-Kwarteng *et al.*, 2019) (see Figure 1).

3.1 Questionnaire development

The theoretical model of this research has nine variables and measures these constructs with the help of various items adapted from prior researches, as their validity and reliability have been established, for example, demonstrating a full questionnaire adapted from prior studies. As most of the studies regarding MCS focus on large-scale organisations, this study is on SMEs. Consequently, the questionnaire is adapted in terms of SMEs. Each item is measured by using a five-point Likert scale that ranged from 1 (strongly disagree) to 5 (strongly agree). Cultural control has 16 items adapted from Sampe (2012), planning control has 13 items, cybernetic control has 8 items and rewards and compensation control has 6 items adapted from Hanzlick and Brühl (2013); administrative control has 9 items adapted from Ramamurthy (1990); differentiation strategy has 4 items, cost leadership has 6 items adapted from Narver and Slater (1990); strategic competency consists of 4 items adapted from Ahmad (2007) and Man and Lau (2000); ethical competency consists of 6 items adapted from Ahmad (2007); financial performance has 3 items adapted from Henri (2006); and non-financial performance has 8 items adapted from Teeratansirikool *et al.* (2013). This study does not have a control variable, only an independent, mediator, moderator and dependent variable.

3.2 Population and sampling

Currently, the research on SMEs has been conducted in Malaysia, and managers or owners are selected for the collection of data. The total number of SMEs in Malaysia is 907,065, which is mentioned on the public website of Malaysia (SMEinfo, 2018). SMEs are divided into five main heads: agriculture, services, mining and quarrying, manufacturing and construction. A total of 950 questionnaires were distributed among owners/managers. The reason behind distributing more than double the questionnaires to respondents is to enhance the response

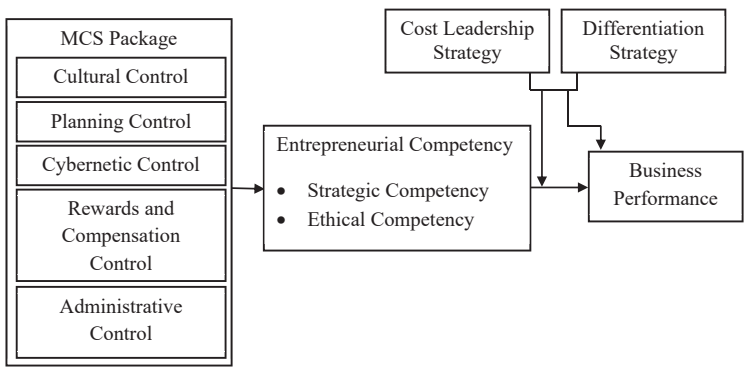

Figure 1.
Theoretical framework

rate, as the population of the current study is nearer to 1m SMEs. This study used a five-point Likert scale that ranged from 1 "strongly disagree" to 5 "strongly agree". Only the established variables from prior research were used, which measure the constructs in five-point Likert scales (Khan *et al.*, 2019; Rehman *et al.*, 2019a). Area cluster sampling is more appropriate for those studies where the population is spread out across a wide area (Sekaran and Bougie, 2016). For this study, area cluster sampling was used, as the population was spread across a wider geographical area. Clusters were developed based on states in Malaysia. There are 16 states in Malaysia, as mentioned in Table 2. Each state deemed one cluster and, from the total 16 states, only nine were selected randomly, Kelantan, Johor, Sarawak, Selangor, Kedah, Kuala Lumpur, Penang, Perak and Sabah, because they cover 84.4% of the total SMEs. While using area cluster sampling, there is a need to follow some steps, such as to firstly define the total number of clusters, then select clusters randomly, as suggested by Sekaran and Bougie (2016). Area cluster sampling has a few advantages. For example, it reduces data collection costs, for this method covers the majority portion and leaves a smaller portion. Secondly, this technique is more suitable in a situation where the population is spread over a wider area (Sekaran and Bougie, 2016). Thirdly, this sampling technique covers the advantages of both stratified and simple random sampling.

3.3 Sample size

Comrey and Lee (1992) state that a sample size below 50 is considered weak, between 51 and 100 is supposedly weak, within 101–200 is adequate, within 201–300 is good, 301–500 is very good, while a sample size of more than 500 is excellent. This study used a sample size of over 1,000, which is considered as an exceptionally good sample size. A total of 950 questionnaires were distributed among managers/owners; out of 950 questionnaires, only 389 questionnaires were returned. Further, 17 questionnaires were excluded due to some missing values. Consequently, only 372 questionnaires were used in the final analysis. The sample size is appropriate, as the unit of analysis is an organisation, and data from 372 organisations has been used for the final analysis. Among the 372 respondents, 218 (58.60%) were male, while the remainder (154/42.20%) were female. The majority of the respondents have professional degrees (204/54.84%), diplomas (101/27.15%) and postgraduate degrees (67/18.01%). Most of the respondents are senior managers 249 (66.93%), while the remaining respondents are business owners.

3.4 Common bias method (CBM)

The current research collected data regarding independent, dependent, mediator and moderating variables at one point in time through a questionnaire. Therefore, there is a chance that a common bias method (CBM) error occurred and affected the data. Generally, common bias is a major issue that is related to a self-survey report (Spector, 2006), as it can inflate the value of the relationship that exists within measured constructs (Conway and Lance, 2010). This study used Harman's single factor; the total variance should not be more than 50%. In this case, Table 3 shows that total variance is 47.35% and there is no common bias issue with data.

Table 2. SMEs in Malaysian States

States	%Age	States	%Age	States	%Age	States	%Age
Selangor	19.8	Penang	7.4	Kelantan	5.1	Terengganu	3.2
Kuala Lumpur	14.7	Sarawak	6.7	Pahang	4.1	Perlis	0.8
Johor	10.8	Sabah	6.2	Negeri Sembilan	3.6	Labuan	0.3
Perak	8.3	Kedah	5.4	Malacca	3.5	Putrajaya	0.1

Components	Initial eigen values			Extraction sum of squared loadings		
	Total	% Of variance	Cumulative %	Total	% Of variance	Cumulative %
1	47.356	47.356	47.356	47.356	47.356	47.356
2	15.016	15.016	62.372	15.016	15.016	62.372
3	11.188	11.188	73.560	11.188	11.188	73.560
4	8.743	8.743	82.303	8.743	8.743	82.303
5	6.824	6.824	89.127	6.824	6.824	89.127
6	4.040	4.040	93.167	4.040	4.040	93.167
7	3.267	3.267	96.434	3.267	3.267	96.434
8	2.639	2.639	99.073	2.639	2.639	99.073
9	0.927	0.927	100.000	0.927	0.927	100.000

Table 3.
Common bias method variance test

3.5 Statistical analysis results

We used partial least square–structural equation modelling (PLS-SEM) to determine the model of the current research, as the PLS-SEM technique has proven to be capable of handling both simple and complex models. It also works on data that does not fulfil the criteria of normality with subtleness (Hair *et al.*, 2014). Furthermore, PLS-SEM is strong in the estimation, as well as when it comes to establishing variable validities compared to the covariance-based approach CBS-SEM (Hair *et al.*, 2014). To use PLS-SEM, we estimated the measurement model, as well as a structural model for the current study.

3.5.1 Measurement model. To estimate the measurement model, the researcher found three validity techniques: content, convergent and discriminant (Hair *et al.*, 2013). For the current research, all these factors meet the standardised criteria, as established by different researchers and as shown in Tables 2–4.

3.5.1.1 Content validity. According to Rehman *et al.* (2019a), content validity refers to a concept: that instruments of questionnaire convey the same meanings as embedded in specific concepts. To measure the content validity of the instruments, the researcher is required to take the opinion of professionals and experts of this area. Indeed, they give an opinion regarding instrument wording and phrases that are then used in the questionnaire (Sekaran and Bougie, 2016). Content validity is assessed through cross-loading, and it means that the value of a measured construct must be greater than other constructs in the same rows and columns (Chin, 1998b; Hair, 2010), as shown in Table 4.

Hence, Table 4 demonstrates the values of all measured constructs greater than other constructs in the same rows and columns. They are shown in italic.

3.5.1.1.1 Cross-loadings. Therefore, Table 4 demonstrates the values of all measured constructs greater than other constructs in the same rows and columns. They are shown in italic.

3.5.1.2 Convergent validity. Convergent validity refers to the level to see that items of variable measure the same variable (Rehman *et al.*, 2019b). According to Zhou (2013), convergent validity performs to see if the items of all constructs reflect effectively their related predictor. Convergent validity was calculated to find three techniques: average variance extracted (AVE), factor loadings and composite reliability (CR). Loadings of all items should be higher than 0.50 and those with a value of less than 0.50 should be deleted (Bhatti and Rehman, 2019). Moreover, values of factor loadings, AVE and CR should be more than 0.50, 0.50 and 0.60, respectively (Hair *et al.*, 2013). According to Nunnally (1978), Cronbach's alpha value should be higher than 0.60.

Table 5 demonstrates that factor loading and AVE have values higher than 0.50, and the CR value is more than 0.60, as recommended by Hair *et al.* (2013). Further, Cronbach's alpha value is greater than 0.60, as recommended by Nunnally (1978).

Variable	Items	CC	PLC	CBC	RWC	ADC	EC	DF	CL	BP
Cultural control	CC1	*0.646*	0.028	0.039	0.093	0.017	0.167	0.102	0.095	0.225
	CC10	*0.836*	0.228	0.105	0.242	0.087	0.348	0.267	0.180	0.302
	CC13	*0.789*	0.235	0.081	0.206	0.052	0.316	0.188	0.174	0.236
	CC14	*0.755*	0.193	0.170	0.263	0.035	0.220	0.174	0.156	0.202
	CC16	*0.810*	0.119	0.003	0.224	0.085	0.325	0.178	0.215	0.255
	CC2	*0.686*	0.088	0.059	0.145	0.047	0.229	0.099	0.122	0.242
	CC3	*0.553*	0.022	0.158	0.127	0.117	0.265	0.188	0.235	0.219
	CC5	*0.648*	0.021	0.082	0.170	0.050	0.288	0.244	0.263	0.188
Planning control	PLC10	0.155	*0.826*	0.518	0.599	0.074	0.122	0.311	0.320	0.137
	PLC2	0.093	*0.766*	0.472	0.695	0.094	0.179	0.528	0.441	0.185
	PLC4	0.074	*0.849*	0.548	0.663	0.126	0.211	0.290	0.452	0.233
	PLC6	0.202	*0.915*	0.583	0.668	0.117	0.221	0.399	0.446	0.244
	PLC8	0.117	*0.902*	0.561	0.622	0.124	0.182	0.293	0.362	0.254
	PLC9	0.215	*0.843*	0.562	0.585	0.074	0.168	0.375	0.373	0.177
Cybernetic control	CBC1	0.088	0.613	*0.730*	0.564	0.132	0.202	0.345	0.401	0.302
	CBC2	0.177	0.596	*0.779*	0.586	0.060	0.163	0.404	0.396	0.264
	CBC3	0.122	0.625	*0.804*	0.554	0.032	0.201	0.373	0.356	0.293
	CBC4	0.068	0.354	*0.776*	0.357	0.024	0.234	0.309	0.361	0.297
	CBC5	0.087	0.451	*0.820*	0.440	0.048	0.267	0.322	0.387	0.320
	CBC6	0.031	0.444	*0.784*	0.423	0.025	0.232	0.255	0.362	0.252
	CBC7	0.079	0.377	*0.716*	0.271	0.030	0.226	0.205	0.264	0.225
Rewards and compensation control	RWC1	0.037	0.615	0.496	*0.710*	0.049	0.252	0.592	0.426	0.203
	RWC2	0.089	0.649	0.426	*0.741*	0.037	0.223	0.520	0.505	0.229
	RWC3	0.093	0.645	0.513	*0.750*	0.133	0.242	0.393	0.511	0.291
	RWC4	0.312	0.511	0.498	*0.872*	0.009	0.447	0.598	0.744	0.530
	RWC5	0.302	0.347	0.369	*0.745*	0.004	0.406	0.569	0.591	0.351
Administrative control	ADC1	0.040	0.074	0.025	0.034	*0.879*	0.066	0.078	0.001	0.121
	ADC2	0.160	0.159	0.052	0.072	*0.877*	0.106	0.060	0.029	0.130
	ADC4	0.145	0.145	0.060	0.028	*0.826*	0.130	0.065	0.014	0.073
	ADC6	0.009	0.050	0.049	0.004	*0.815*	0.046	0.031	0.020	0.088
	ADC9	0.028	0.061	0.002	0.019	*0.848*	0.075	0.053	0.012	0.093
Entrepreneurial competency	SC1	0.348	0.434	0.393	0.558	0.050	*0.729*	0.611	0.588	0.434
	SC2	0.323	0.034	0.153	0.263	0.170	*0.846*	0.455	0.444	0.662
	SC4	0.362	0.160	0.196	0.349	0.011	*0.720*	0.357	0.445	0.484
	EC1	0.242	0.001	0.170	0.204	0.089	*0.799*	0.346	0.411	0.622
	EC2	0.238	0.022	0.114	0.216	0.131	*0.821*	0.388	0.411	0.634
	EC5	0.290	0.416	0.329	0.612	0.035	*0.754*	0.685	0.655	0.385
Differentiation strategy	DF1	0.261	0.322	0.303	0.567	0.099	0.491	*0.657*	0.513	0.245
	DF2	0.202	0.213	0.275	0.335	0.036	0.381	*0.593*	0.255	0.267
	DF3	0.111	0.318	0.278	0.468	0.120	0.364	*0.769*	0.503	0.307
	DF4	0.189	0.361	0.324	0.620	0.100	0.502	*0.829*	0.588	0.389
Cost leadership	CL1	0.109	0.388	0.363	0.500	0.077	0.487	0.614	*0.638*	0.314
	CL2	0.347	0.569	0.493	0.834	0.005	0.566	0.589	*0.857*	0.599
	CL4	0.170	0.343	0.336	0.584	0.055	0.498	0.518	*0.865*	0.463
	CL5	0.098	0.134	0.250	0.374	0.008	0.414	0.372	*0.758*	0.415
Business performance	BP11	0.313	0.177	0.250	0.368	0.075	0.611	0.402	0.489	*0.646*
	BP1	0.116	0.249	0.294	0.303	0.073	0.377	0.321	0.361	*0.572*
	BP2	0.273	0.186	0.259	0.254	0.170	0.419	0.195	0.351	*0.728*
	BP3	0.197	0.238	0.346	0.470	0.111	0.544	0.354	0.526	*0.840*
	BP4	0.349	0.211	0.284	0.409	0.069	0.535	0.355	0.500	*0.875*
	BP5	0.241	0.183	0.277	0.326	0.015	0.555	0.327	0.452	*0.782*
	BP6	0.262	0.151	0.255	0.317	0.077	0.590	0.305	0.448	*0.808*
	BP8	0.229	0.152	0.272	0.353	0.160	0.571	0.352	0.457	*0.839*

Table 4.
Cross-loadings

Variables	Items	Factor loading	AVE	CR	Cronbach alpha	R^2
Cultural control	CC1	*0.646*	0.519	0.895	0.864	
	CC10	*0.836*				
	CC13	*0.789*				
	CC14	*0.755*				
	CC16	*0.810*				
	CC2	*0.683*				
	CC3	*0.553*				
	CC5	*0.648*				
Planning control	PLC10	*0.826*	0.726	0.941	0.924	
	PLC2	*0.766*				
	PLC4	*0.849*				
	PLC6	*0.915*				
	PLC8	*0.902*				
	PLC9	*0.843*				
Cybernetic control	CBC1	*0.730*	0.598	0.912	0.888	
	CBC2	*0.779*				
	CBC3	*0.804*				
	CBC4	*0.776*				
	CBC5	*0.820*				
	CBC6	*0.784*				
	CBC7	*0.716*				
Rewards and compensation control	RWC1	*0.710*	0.586	0.876	0.836	
	RWC2	*0.741*				
	RWC3	*0.750*				
	RWC4	*0.872*				
	RWC5	*0.745*				
Administrative control	ADC1	*0.879*	0.722	0.928	0.905	
	ADC2	*0.877*				
	ADC4	*0.826*				
	ADC6	*0.815*				
	ADC9	*0.848*				
Entrepreneurial competency	SC1	*0.729*	0.608	0.903	0.870	0.342
	SC2	*0.846*				
	SC4	*0.720*				
	EC1	*0.799*				
	EC2	*0.821*				
	EC5	*0.754*				
Differentiation strategy	DF1	*0.657*	0.515	0.807	0.711	
	DF2	*0.593*				
	DF3	*0.769*				
	DF4	*0.829*				
Cost leadership	CL1	*0.638*	0.616	0.864	0.791	
	CL2	*0.857*				
	CL4	*0.865*				
	CL5	*0.758*				
Business performance	BP11	*0.646*	0.589	0.919	0.897	0.561
	BP1	*0.572*				
	BP2	*0.728*				
	BP3	*0.840*				
	BP4	*0.875*				
	BP5	*0.782*				
	BP6	*0.808*				
	BP8	*0.839*				

Table 5.
Convergent validity

3.5.1.3 Discriminant validity. Discriminant validity refers to a situation in which research examines two factors that are different in terms of statistics (Rehman *et al.*, 2019a). Discriminant validity ascertains by firstly taking the square roots of AVE, then this square root is compared with the correlations of other variables of the theoretical model (Chin, 2010; Fornell and Larcker, 1981). Moreover, the diagonal values of all constructs must be greater than that in both the same rows and columns (Fornell and Larcker, 1981). However, Table 6 demonstrates that the current study fulfils discriminant validity conditions.

The above-mentioned Table 5 demonstrates all diagonal upper values greater than other values in the same columns and rows, as suggested by Fornell and Larcker (1981).

4. Empirical results

At first, a direct relationship was examined to compute the direct effect of cultural control, planning control, cybernetic control, rewards and compensation control and administrative control on business performance and entrepreneurial competency. Figure 3 and Table 7 show beta values as well as the *t*-value in confirming if the hypotheses are supported or not.

4.1 Direct hypotheses' results

Table 7 shows that there are eight direct relationship hypotheses and all are supported. Cultural control influences entrepreneurial competencies ($\beta = 0.267$, $t = 5.430$, and $p < 0.01$). Thus, hypothesis H1 is accepted. Planning control has an impact on entrepreneurial competency as $\beta = 0.370$, $t = 4.383$ and $p < 0.01$. Thus, our hypothesis H2 is supported. Cybernetic control influences entrepreneurial competency as $\beta = 0.143$, $t = 2.885$ and the p-value is less than 0.01. Hence, hypothesis H3 is accepted. Rewards and compensation control has a positive influence on entrepreneurial competency: $\beta = 0.583$, $t = 6.870$ and $p < 0.01$. Thus, hypothesis H4 is supported. Administrative control influences entrepreneurial

Table 6.
Discriminant validity (Fornell–Larcker)

Variable	CC	PLC	CBC	RWC	ADC	EC	DF	CL	BP
CC	*0.721*								
PLC	0.165	*0.852*							
CBC	0.118	0.636	*0.774*						
RWC	0.261	0.755	0.589	*0.766*					
ADC	0.089	0.123	0.016	0.041	*0.850*				
EC	0.384	0.217	0.284	0.461	0.104	*0.780*			
DF	0.257	0.426	0.409	0.699	0.070	0.603	*0.718*		
CL	0.253	0.473	0.468	0.757	0.001	0.626	0.658	*0.785*	
BP	0.328	0.248	0.363	0.461	0.121	0.695	0.429	0.591	*0.768*

Table 7.
Direct hypotheses' results

Hypotheses	Hypotheses' paths	Path coefficient	Std. Deviation	*t*-values	*p*-values	Decision
H1	CC → EC	0.267	0.049	5.430	0.000	Accepted
H2	PLC → EC	0.370	0.084	4.383	0.000	Accepted
H3	CBC → EC	0.143	0.051	2.885	0.005	Accepted
H4	RCC → EC	0.583	0.085	6.870	0.000	Accepted
H5	AC → EC	0.099	0.042	2.386	0.017	Accepted
H6	EC → BP	0.554	0.071	7.819	0.000	Accepted
H7	CL → BP	0.249	0.062	3.984	0.000	Accepted
H8	DF → BP	0.223	0.057	3.895	0.000	Accepted

competency $\beta = 0.099$, $t = 2.386$ and has a p-value less than 0.01. Hence, hypothesis H5 is accepted. Entrepreneurial competency has highly significantly and positively influenced business performance ($\beta = 0.554$, $t = 7.819$, $p < 0.01$), so hypothesis H6 is accepted. Cost leadership strategy has an increasing influence on business performance ($\beta = 0.249$, $t = 3.984$ and $p < 0.01$). Hence, hypothesis H7 is supported. Moreover, differentiation strategy has a positive influence on business performance and supported hypothesis H8 as $\beta = 0.223$, $t = 3.895$ and $p < 0.01$.

4.2 Testing moderating effect

This study uses a product indicator approach to test the moderating effect by using a PLS-SEM technique and Cohen's (1988a) effect size criterion to identify and calculate the strength of the moderating effect.

Table 8 demonstrates that cost leadership significantly and positively moderates between entrepreneurial competency and business performance as $\beta = 0.194$, t-value = 3.820 and p-value < 0.01. Hence, hypothesis H9 is supported. Moreover, differentiation strategy positively and significantly moderates between entrepreneurial competency and business performance as $\beta = 0.171$, t-value = 3.266 and p-value < 0.01. Hence, hypothesis H10 is supported. Figures 2 and 3 demonstrate that cost leadership and differentiation strategy significantly strengthen the relationship between entrepreneurial competency and business performance.

4.3 Mediation analysis

The main consideration of the mediation analysis is that there should be a significant relationship between independent constructs and dependent constructs through the mediating variable (Memon *et al.*, 2018). Researchers should follow Preacher and Hayes' (2008) approach and bootstrapping the sampling distribution of the indirect/mediation effect. Significantly, bias-corrected bootstrapping is deemed as a powerful method to detect the

Hypotheses	Hypotheses' paths	Path coefficient	Std. Deviation	*t*-values	*p*-values	Decision
H9	CL*EC → BP	0.194	0.051	3.820	0.000	Accepted
H10	DF*EC → BP	0.171	0.052	3.266	0.001	Accepted

Table 8.
Indirect hypotheses' results (moderation)

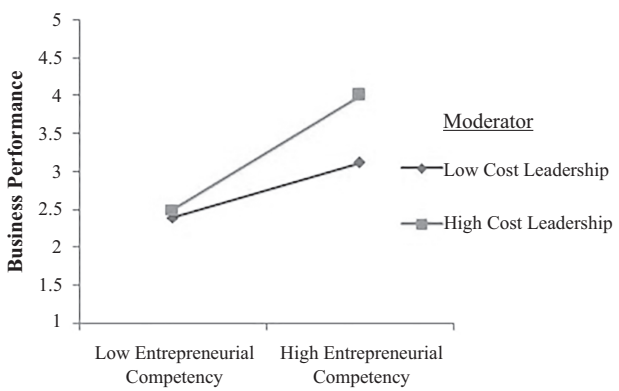

Figure 2.
Moderating effect of cost leadership

mediation (Memon *et al.*, 2018). In this study, the bootstrapping technique is used: prior researchers argue that this method is superior to Baron and Kenny (1986)'s traditional method (MacKinnon *et al.*, 2007).

Table 9 demonstrates the following results. Entrepreneurial competency significantly mediates between cultural control and business performance ($\beta = 0.148, t = 4.437, p < 0.01$), so hypothesis H11 is accepted. Furthermore, entrepreneurial competency significantly mediates between planning control and business performance ($\beta = 0.205, t = 3.879, p < 0.01$). Hence, hypothesis H12 is supported. Moreover, entrepreneurial competencies mediate between cybernetic control and business performance ($\beta = 0.079, t = 2.487, p < 0.01$). Thus, hypothesis H13 is accepted. Entrepreneurial competencies significantly mediate between rewards and compensation control and business performance ($\beta = 0.323, t = 5.004, p < 0.01$), so hypothesis H14 is accepted. As administrative control has no direct relationship with business performance, entrepreneurial competencies significantly mediate the relationship between administrative control and business performance ($\beta = 0.055, t = 2.467, p < 0.01$). Thus, hypothesis H15 is supported. The current research shows that entrepreneurial competencies significantly mediate between the MCS package and organisational performance.

4.4 The predictive relevance of the study model

In this research for the predictive relevance of the theoretical model, two things are used: *R*-square and Q^2. *R*-square refers to the variance enlightened by collectively exogenous constructs.

Table 10 reveals that 34.2% of entrepreneurial competencies are explained by cultural, planning, cybernetic, rewards and compensation and administrative control. Business

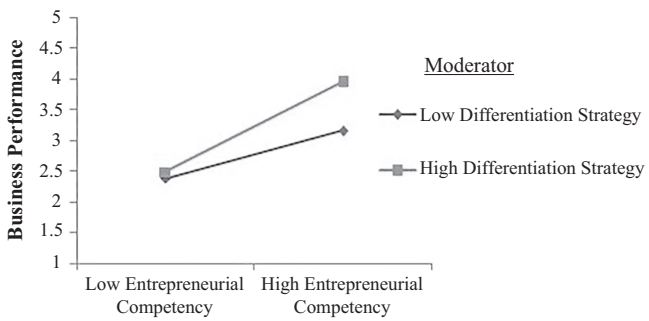

Figure 3.
Moderating effect of differentiation strategy

Hypotheses	Hypotheses' paths	Path coefficient	Std. Deviation	*t*-values	*p*-values	Decision
H11	CC → EC → BP	0.148	0.033	4.437	0.000	Accepted
H12	PLC → EC → BP	0.205	0.053	3.879	0.000	Accepted
H13	CBC → EC → BP	0.079	0.032	2.487	0.006	Accepted
H14	RCC → EC → BP	0.323	0.065	5.004	0.000	Accepted
H15	AC → EC → BP	0.055	0.022	2.467	0.007	Accepted

Table 9.
Indirect relationships

	R^2
Entrepreneurial competency	0.342
Business performance	0.561

Table 10.
The predictive relevance of the model

performance explained 56.1% by cultural, planning, cybernetic, rewards and compensation, administrative control, differentiation strategy, cost leadership and entrepreneurial competencies. *R*-square values within 0.02–0.13 are considered weak, 0.13–0.26 are considered moderate and more than 0.26 is considered substantial (Cohen, 1988a). In this study, in the case of entrepreneurial competencies and business performance, *R*-square is substantial. Cross-validated redundancy was assessed in PLS with the help of a blindfolding technique. Further, the value of Q^2 must be greater than zero, as suggested by Chin (1998a).

In the current research, Table 11 reveals the above-mentioned criteria that Q^2 meets, as Q^2 for entrepreneurial competencies is 0.188, while for business performance, they are 0.299.

4.5 The effect size of a model

According to Cohen (1988b), effect size is small effect ($f^2 = 0.02$), medium effect ($f^2 = 0.15$) and large effect ($f^2 = 0.35$). However, this study shows that cultural, planning, cybernetic, rewards and compensation, administrative control, differentiation strategy and cost leadership have a small effect size: 0.008, 0.016, 0.036, 0.011, 0.014, 0.033 and 0.037, respectively. Moreover, entrepreneurial competency has a large effect size, such as 0.315.

5. Discussion and conclusion

The motive of this study is to examine the influence of cultural, planning, cybernetic, rewards and compensation and administrative control on business performance, alongside the mediating effect of entrepreneurial competency. Moreover, to determine the moderating role of business strategies (cost leadership, differentiation strategy) between entrepreneurial competencies and business performance. Cultural control has an influence on entrepreneurial competencies and H1 is supported. The findings are the same with prior conceptual studies that reveal that organisational culture can influence entrepreneurial competencies (Sajilan and Tehseen, 2015). Planning control has a significant and positive influence on entrepreneurial competencies and supported H2. This is a pioneer study that determines planning control influence on entrepreneurial competencies. Cybernetic control has a significant and positive influence on entrepreneurial competencies and supported hypothesis H3. This study determines cybernetic control influence on entrepreneurial competencies. Rewards and compensation control has an impact on entrepreneurial competencies and accepts H4. This is a pioneer study that determines the influence of rewards and compensation control on entrepreneurial competencies. Administrative control has significantly and positively impacted on entrepreneurial competencies and H5 is supported. This is pioneer research that determines administrative control influence on entrepreneurial competencies. The findings are consistent with the RBV theory that MCS package (cultural control, planning control, cybernetic control, rewards and compensation control and administrative control) is considered to be an organisational internal resource to determine organisational capabilities (for our study, entrepreneurial competencies) (Barney, 1991; Rehman *et al.*, 2019a).

Entrepreneurial competencies have a significant influence on measuring business performance and supported H6. The results are in line with prior studies on entrepreneurial competencies (Tehseen and Ramayah, 2015). Further, the results are also in line with the RBV theory that entrepreneurial competencies significantly improve firms' performance (Barney, 1991). Cost leadership and differentiation strategies have an impact on business performance

	SSO	SSE	$Q^2 = (1-\text{SSE/SSO})$
Entrepreneurial competency	2232.0	1811.681	0.188
Business performance	2976.0	2085.124	0.299

Table 11. Cross-validated redundancy

and supported H7 and H8. The results are in line with Kankam-Kwarteng *et al.*'s (2019) finding that cost leadership significantly improves a firm's performance. Moreover, differentiation strategies are positively associated with a firm's performance (Teeratansirikool *et al.*, 2013). Cost leadership and differentiation strategy significantly moderate between entrepreneurial competency and business performance. Hence, our hypotheses H9 and H10 are supported. Entrepreneurial competency significantly and positively mediates between cultural, planning, cybernetic, rewards and compensation, administrative control and business performance. Thus, H11, H12, H13, H14 and H15 are supported. The results are consistent with the RBV theory that entrepreneurial competencies significantly explain the relationship between organisational internal resources and a firm's performance (Barney, 1991; Rehman *et al.*, 2019a).

Finally, MCS package (cultural control, planning control, cybernetic control, rewards and compensation control and administrative control) is positively associated with entrepreneurial competency. Hence, the first research objective was fulfilled. Moreover, entrepreneurial competency significantly improves the performance of Malaysian SMEs. Thus, the second research objective was considerably achieved. Business strategies, such as cost leadership and differentiation strategy, significantly improve SMEs' performance. Therefore, the third research objective is fully achieved. Besides, business strategies significantly moderate the relationship between entrepreneurial competency and business performance. Thus, the fourth research objective was fulfilled. Finally, entrepreneurial competency significantly explains the relationship between MCS package (cultural control, planning control, cybernetic control, rewards and compensation control and administrative control) and business performance. Therefore, the fifth research objective is fully achieved.

5.1 Theoretical implications

This study has created theoretical implications. Firstly, our study contributes in terms of literature by developing and then testing a new empirical theoretical model by incorporating MCS package (cultural, planning, cybernetic, rewards and compensation, administrative control) with the mediating effect of entrepreneurial competency (strategic competency and ethical competency) and business performance. Furthermore, this study used business strategies (cost leadership and differentiation strategy) as a moderating variable between entrepreneurial competency and business performance that prior studies ignored. Secondly, this study adopts the RBV theory to explain the theoretical framework that provides some interesting outcomes. A few of the organisational resources give contradictory results, as these resources do not explain business performance directly, but rather explained it through mediation. Thirdly, the current study contributes to the body of knowledge in terms of cultural, planning, cybernetic, rewards and compensation, administrative control, entrepreneurial competency and business strategies, as scant research has been conducted in this area regarding SMEs. Barney and Arikan (2001) conclude that the RBV theory ignores business strategy, as it plays a crucial role in determining business performance. Hence, this study used business strategies in light of the RBV theory.

5.2 Practical implications

The findings of this study provide some practical implications for the management of SMEs. This study suggests that the managers of SMEs should focus on the MCS package to determine business performance through entrepreneurial competencies. Moreover, a sole use of organisational resources might not provide better results, but, with the help of entrepreneurial competencies, they could. This study recommends the management of SMEs that pays much to attention on MCS's package as a whole because some time individual element of the MCS package does not give many benefits that provide the whole package. This study practically contributes to owners and managers by giving an idea that

resources, such as cultural, planning, cybernetic, rewards and compensation, administrative control, entrepreneurial competency, cost leadership and differentiation strategy, all are important and should not be ignored whilst measuring business performance for SMEs in Malaysia. This is a pioneer study that determined the influence of the MCS package (cultural, planning, cybernetic, rewards and compensation, administrative control), with entrepreneurial competencies as a mediating variable, on SMEs throughout Malaysia. This will attract top management in their decision-making processes to determine business performance. Moreover, this study shows that business strategies, such as cost leadership and differentiation strategy, provide fruitful results, for they strengthen the relationship between entrepreneurial competencies and business performance.

5.3 Future directions

As discussed, most studies between MCS (levers of control) and business performance have been conducted in developed countries, meaning less attention has been paid on MCS as a package in developing countries. Therefore, future research is needed to add another mediating variable, such as culture. Moreover, research was conducted to see the impact of the MCS package on business performance through the mediating effect of entrepreneurial competencies (strategic competencies and ethical competencies) in both developed and developing countries. Future research should be conducted on the MCS package and business performance by using RBV theory, as well as resource orchestration theory. Recently, researchers measured environmental performance through corporate social responsibility, green innovation and environmental strategy (Kraus *et al.*, 2020). In the future, researchers can measure environmental performance through the environmental MCS package and green constructs, such as green human resource practices, green capability and green supply chain management in light of natural RBV theory.

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Economic policy uncertainty, value of cash and financial crisis

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Abstract

Purpose – This paper investigates the effect of economic policy uncertainty on value of cash before and after the global financial crisis.

Design/methodology/approach – We investigate the relationship between economic policy uncertainty and value of excess cash based on the valuation model of Fama and French (1998). Baker *et al.* (2016) news-based index (BBD index) is employed to calculate measures of economic policy uncertainty. Our research sample includes 103,474 observations from 11,000 firms across 19 countries over the period 2004–2016.

Findings – We find that economic policy uncertainty is negatively "positively" related to value of cash in the pre-crisis "post-crisis" period. Moreover, we also document that the positive effect of economic policy uncertainty in the post-crisis period is stronger in financially constrained firms.

Originality/value – While prior studies find a relationship between economic policy uncertainty and cash levels or the effect of firm-level uncertainty on value of cash, this paper shows how economic policy uncertainty as an institutional environment factor affects value of cash. Moreover, it documents that economic policy uncertainty has opposite effects on value of cash before and after the global financial crisis.

Keywords Economic policy uncertainty, Value of cash, Cash holdings, Financial crisis

Paper type Research paper

1. Introduction

Policy making and implementing processes typically result in a large amount of uncertainty in the economy and thus influence corporate financial behavior (Zhang *et al.*, 2015). Recently, the relationship between economic policy uncertainty and corporate liquidity policy has attracted much attention from researchers. Economic policy uncertainty increases precautionary motive for saving cash. Demir and Ersan (2017), Phan *et al.* (2019) show that economic policy uncertainty is positively related to corporate cash holdings. However, there has been little knowledge about how economic policy uncertainty determines value of cash. In addition, prior studies show that a financial crisis is an exogenous shock to corporate financial decisions through the mechanism of external financial constraint (Tran *et al.*, 2017). Therefore, this paper investigates the effect of economic policy uncertainty on value of cash before and after the global financial crisis.

When facing high economic policy uncertainty, investors may have two opposite views on corporate cash holdings. On the one hand, they tend to value cash higher because corporate cash holdings become more important for firms' survival and investment. Firms have to

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struggle to survive or lose their investment opportunities if they fail to have enough cash and their external financing are more expensive due to high uncertainty (External financing channel). On the other hand, investors may recognize that high economic policy uncertainty is an opportunity for corporate managers to save more cash and overinvest in unprofitable projects. Due to the separation of ownership and control, corporate managers tend to use their firms' resources to overinvest in unprofitable projects in order to serve their own benefits. When firms face high uncertainty caused by economic policy, managers take advantage of precautionary reasons to hold more cash and then use it to benefit themselves through overinvestment. Therefore, investors assign lower value to cash (agency cost channel). We argue that in the pre-crisis period, the financial system is in normal condition and thus investors have high incentives to focus more on agency cost channel than external financing channel. As a result, high economic policy uncertainty leads to lower value of cash during the pre-crisis period. However, when the financial system is under crisis, investors tend to concentrate on external financing channel more than agency cost channel. Therefore, economic policy uncertainty positively affects value of cash during the post-crisis period.

Following Drobetz *et al.* (2010), Kyröläinen *et al.* (2013), Pinkowitz *et al.* (2006), we investigate the relationship between economic policy uncertainty and value of excess cash based on the valuation model of Fama and French (1998). Baker *et al.* (2016) news-based index (BBD index) is employed to calculate measures of economic policy uncertainty. With a sample of 103,474 observations from 11,000 firms across 19 countries over the period 2004–2016, the effect of economic policy uncertainty on value of cash is negative in the pre-crisis period 2004–2008 but it becomes positive in the post-crisis period 2009–2016. Our robustness checks with a reduced sample, an alternative measure of cash and other measures of economic policy uncertainty also show consistent results. Moreover, we continue to examine how firm-specific financial constraint determines the relationship between economic policy uncertainty and value of cash in the post-crisis period. We use the country-year top and bottom 30th percentiles of Kaplan and Zingales (1997) index, Whited and Wu (2006) index and firm size as criteria to classify observations into sub-samples of financially constrained and unconstrained firms. We find that the positive effect of economic policy uncertainty on value of cash is stronger in financially constrained firms during the post-crisis period.

This paper has two important contributions to the literature as follows. First, we contribute to the literature of corporate cash holdings. While prior studies find a relationship between economic policy uncertainty and cash levels (Demir and Ersan, 2017; Phan *et al.*, 2019) or the effect of firm-level uncertainty on value of cash (Im *et al.*, 2017), we show how economic policy uncertainty as an institutional environment factor affects value of cash. Second, our research provides a contribution to the literature of financial crisis. The extant literature shows that a financial crisis changes corporate cash holdings (Arslan *et al.*, 2006; Lian *et al.*, 2011; Tran, 2019a), dividend policy (Al-Malkawi *et al.*, 2014; Rhee and Park, 2018), the effects of shareholder rights and creditor rights on dividend policy Tran *et al.* (2017) and the effect of shareholder rights on cash holdings (Tran, 2020). In this paper, we document that economic policy uncertainty has opposite effects on value of cash before and after the global financial crisis.

The rest of this paper is structured as follows: Section 2 reviews the literature and develops research hypotheses. In Section 3, we design research models following prior studies. Section 4 presents data source and data description. Section 5 shows regression results, robustness checks and additional analysis. Section 6 concludes.

2. Literature review and hypothesis development

The extant literature shows that corporate cash holdings lead to both costs and benefits. Corporate cash holdings are opportunities for managers to expropriate shareholders. Firms need to accumulate cash due to their precautionary motive (Myers and Majluf, 1984; Ozkan and

Ozkan, 2004; Phan *et al.*, 2019). Firms hold cash a safety buffer that helps them size profitable investment projects and handle unpredictable contingencies. Bates *et al.* (2009) find that firms save more cash when facing riskier cash flows. Hugonnier *et al.* (2014) show that corporate cash holdings are positively related to the uncertainty of capital supply and firms with more cash are more likely to seize emerging investment opportunities. Almeida *et al.* (2004), Ferreira and Vilela (2004), Kim *et al.* (2011) also find empirical evidence for precautionary motive of cash holdings. On the other hand, corporate cash holdings lead to agency costs. According to agency theory, corporate managers tend to use cash to serve their own benefits at shareholders' expenses (Jensen, 1986; Jensen and Meckling, 1976). Dittmar and Mahrt-Smith (2007), Dittmar *et al.* (2003), Jebran *et al.* (2019), Kalcheva and Lins (2007), La Porta *et al.* (1998), Pinkowitz *et al.* (2006) find that weak corporate governance results in high levels of corporate cash holdings.

As a crucial government policy, economic policy generates uncertainty in business environment when it is made and implemented by government agencies. Many prior studies show that economic policy uncertainty determines firm performance and corporate financial decisions. Sum and Fanta (2012) find a long-run positive association between economic policy uncertainty and excess return volatility in the US from 1985 to 2011. Debata and Mahakud (2018) show that the effect of economic policy uncertainty on stock market liquidity is moderate in normal market conditions but it is strong during financial crises. Dash *et al.* (2021) also document a causal relationship between economic policy uncertainty and stock market liquidity. Besides, Hoque *et al.* (2019) find that global economic policy uncertainty has a negative impact on the overall stock market and geopolitical risk makes it stronger. Paule-Vianez *et al.* (2020) show that economic policy uncertainty has a greater effect on return and volatility during recession periods.

In addition, economic policy uncertainty influences a wide range of corporate financial decisions including corporate investment (Kang *et al.*, 2014; Wang *et al.*, 2014, 2017), capital structure Zhang *et al.* (2015), dividend policy (Attig *et al.*, 2021) and corporate risk-taking (Tran, 2019b). Demir and Ersan (2017) investigate the relationship between economic policy uncertainty and corporate liquidity policy in BRIC countries during the period from 2006 to 2015 and find that firms prefer holding more cash when they face higher uncertainty. Phan *et al.* (2019) argue that economic policy uncertainty may affect corporate cash holdings in two mechanisms. First, following the real option hypothesis, firms tend to delay investment under high uncertainty and this leads to higher cash holdings. Second, this government policy uncertainty reduces asset returns and thus increases costs of external funds. When firms face high costs of external financing, they are motivated to reserve more cash in order to buffer against unexpected financial shocks and maintain their normal operation. Using a sample of 119,322 observations from 13,981 US firms between 1986 and 2015, they find that there is a positive relationship between economic policy uncertainty and cash reserves. Remarkably, their additional analysis shows that precautionary motive is more effective than investment delay in explaining this positive relationship. Moreover, Im *et al.* (2017) examine the effects of firm-specific uncertainty and its three components on value of cash in the US market. With a sample of 94,568 firm-years over the period from 1980 to 2015, they also document that firms with higher uncertainty have higher value of cash holdings. However, these prior studies have not fully addressed the effect of economic policy uncertainty on value of cash across countries.

Furthermore, the extant literature shows that as an exogenous shock, a financial crisis significantly influences corporate liquidity policy. Arslan *et al.* (2006) show that a financial crisis increases both corporate cash reserves and cash-cash flow sensitivity through its impact on firms' financial constraint. Consistently, Lian *et al.* (2011) argue that the global financial crisis makes capital markets become less efficient and bank credit dry up; therefore, precautionary motive of cash holdings become more important. Using a sample of 8,663 observations from 1,435 listed firms in China, they find that firms accumulate more cash during the crisis period. However, Tran (2019a) shows that the global financial crisis reduces

corporate cash holdings in Vietnam. This can be explained that the amount of cash firms consume is higher than the amount they save due to external financial constraint. Moreover, Chang *et al.* (2017) also document that value of cash holdings are higher under the impact of the global financial crisis. Motivated by these prior studies, this paper investigates the effect of economic policy uncertainty on value of cash before and after the financial crisis.

Before the global financial crisis, the financial system operates normally and external funds are highly available to firms. Under this condition, corporate managers are more flexible to conduct corporate liquidity policy. When firms face high economic policy uncertainty, corporate managers may take this opportunity to expropriate shareholders by accumulating more cash (Jensen, 1986; Jensen and Meckling, 1976). Recognizing managers' expropriation behavior and highly available external funds to firms, investors assign lower value to firms with higher cash levels. Attig *et al.* (2021) also find that firms pay dividends as a means to reduce agency costs of equity under high economic policy uncertainty. Drobetz *et al.* (2010) also show that information asymmetry negatively affects market value of corporate cash holdings. Consequently, we hypothesize that the effect of economic policy uncertainty on cash value is negative in the pre-crisis period.

H1. Economic policy uncertainty is negatively related to value of cash during the pre-crisis period.

Nevertheless, after the global financial crisis breaks out, firms face severely external financial constraint (Duchin *et al.*, 2010; Flannery *et al.*, 2013; Lian *et al.*, 2011; Roubini, 2007). Under this exogenous shock, high economic policy uncertainty reduces firms' access to credit and increases their costs of external financing more severely. Therefore, firms need more cash to seize emerging investment opportunities and handle unpredictable contingencies. Firms with low cash holdings may not survive through the crisis (Campello *et al.*, 2011; Ivashina and Scharfstein, 2010). Although investors understand that corporate managers may take economic policy uncertainty to expropriate shareholders, they still value firms with more cash higher due to severe external financial constraint. Consequently, we hypothesize that high economic policy uncertainty increases value of cash during the post-crisis period.

H2. Economic policy uncertainty is positively related to value of cash during the post-crisis period.

3. Research models

In line with prior studies (Drobetz *et al.*, 2010; Frésard and Salva, 2010; Kyröläinen *et al.*, 2013; Pinkowitz *et al.*, 2006), we modify the valuation model of Fama and French (1998) to examine the effects of economic policy uncertainty on value cash as follows.

$$\begin{aligned} \mathrm{MV}_t = {} & \alpha + \beta_1 \mathrm{EPU1}_t \times \mathrm{EXC}_t + \beta_2 \mathrm{EXC}_t + \beta_3 \mathrm{EPU1}_t + \beta_4 \mathrm{EN}_t + \beta_5 \mathrm{dEN}_t + \beta_6 \mathrm{dEN}_{t+1} \\ & + \beta_7 \mathrm{dNA}_t + \beta_8 \mathrm{dNA}_{t+1} + \beta_9 \mathrm{RD}_t + \beta_{10} \mathrm{dRD}_t + \beta_{11} \mathrm{dRD}_{t+1} + \beta_{12} \mathrm{IN}_t + \beta_{13} \mathrm{dIN}_t \\ & + \beta_{14} \mathrm{dIN}_{t+1} + \beta_{15} \mathrm{DV}_t + \beta_{16} \mathrm{dDV}_t + \beta_{17} \mathrm{dDV}_{t+1} + \beta_{18} \mathrm{dMV}_t + \eta C\_E \\ & + \pi C\_\mathrm{control}^{*}\mathrm{EXC}_t + \varphi \mathrm{Industry\ dummies} + \gamma \mathrm{Year\ dummies} + \varepsilon \end{aligned} \quad (1)$$

Where EPU1 is economic policy uncertainty calculated by the average of twelve monthly BBD indices within a fiscal year (Demir and Ersan, 2017). BBD indices are a news-based measure of uncertainty created by government economic policy. They are developed by Baker *et al.* (2016) and published at http://www.policyuncertainty.com. The original monthly BBD indices are large while the dependent variable is small. This results in small regression coefficients. Hence, before calculating EPU1, we rescale original BBD indices to have a shorter scale ranging from

0 to 100. Higher values of EPU1 indicate higher economic policy uncertainty. X_t is the value of variable X in year t. dX_t is the annual change in X in year t. dX_{t+1} is the annual change in X in year $t+1$. MV is market value measured by year-end market capitalization plus book value of debt. EXC is excess cash measured by the difference between actual cash holdings and normal cash holdings predicted by the IV regression in accordance with Appendix 1. EN is earnings before interest and extraordinary items. NA is net assets calculated by total assets minus total cash and short-term investment. RD is research and development expenditure. IN is interest expense. DV is cash dividend. All firm-level variables except excess cash are deflated by net assets. In line with Kyröläinen *et al.* (2013), we employ a vector of country-specific control variables (*C*_control) including anti-self-dealing index (ASD), revised creditor right index (CRE), rule of law (ROL), private credit (PCRE), market capitalization (MCAP), GDP per capita (GCAP) and GDP growth rate (GGRO). Anti-self-dealing index is a proxy of shareholder protection developed by Djankov *et al.* (2008). Its higher values imply stronger shareholder rights. Revised creditor right index from Djankov *et al.* (2007) measures legal protection of creditors. Its higher values imply stronger creditor rights. Rule of law is "the average of the months of April and October of the monthly index" published in International Country Risk Guide between 1982 and 1995. This index ranges from 0 to 10 and its higher values represent more tradition of law and order. In addition, private credit is measured by domestic credit to private sector to GDP ratio. Market capitalization is total market capitalization to GDP ratio. GDP per capita is measured by the natural logarithm of GDP per capita. GDP growth rate is the annual growth of GDP. Macroeconomic information is annually published by World Bank.

Following Kyröläinen *et al.* (2013), Tran (2019b), we employ pooled OLS regression model to estimate Eqn (1) with two sub-samples of pre-crisis period 2004–2008 and post-crisis period 2009–2016 separately. Standard errors are clustered by firm. The interaction between economic policy uncertainty and excess cash is expected to be negative (positive) in the pre-crisis (post-crisis) period.

4. Research data

To construct the research sample, we use only choose 19 countries whose economic policy uncertainty is available at http://www.policyuncertainty.com. Accounting information of firms incorporated in these countries is collected from Compustat database. Following prior cross-country research (Kyröläinen *et al.*, 2013; Thakur and Kannadhasan, 2019; Tran, 2019b), we eliminate the following firms and observations: (1) firms classified into utilities and financial sectors in accordance with SIC codes; (2) observations without consolidated financial reports; (3) firms with various issues of shares; (4) observations with abnormal information (i.e. negative values of total assets, net income and common equity; (5) observations with missing information and (6) firms contributing fewer than five observations in the research period. The final research sample consists of 103,474 observations from 11,000 unique firms between 2004 and 2016. Although our research sample ends in 2016, we use the data of 2017 to calculate the annual change in variable X in year $t+1(dX_{t+1})$ as shown in Eqn (1). The year 2018 experiences the trade war between US and China is another exogenous shock in the macroeconomic environment. Data of the fiscal year 2019 has not been completely available in Compustat for many countries and it may be affected by the pandemic Covid-19 – a severe shock for the world economy. However, our research only focuses on how the global financial crisis determines the relationship between economic uncertainty and cash value. Therefore, we fail to include the data for the period 2018–2019 in our sample. We winsorize all firm-level variables at the 1st and the 99th percentile [1] to control outlier effects.

Table 1 describes our research sample. Panel A shows that firm value significantly varies from 0.438 to 12.695. Its mean and median are 1.671 and 1.176 respectively. Excess

Panel A. Firm-level data

Variables	Mean	SD	1st quartile	Median	3rd quartile	Min	Max
$MV_{i,t}$	1.671	1.672	0.898	1.176	1.176	0.438	12.695
$EXC_{i,t}$	−0.098	1.147	−0.664	0.137	0.713	−3.866	1.784
$LNC_{i,t}$	−2.370	1.191	−2.991	−2.186	−1.546	−6.372	−0.271
$CAS_{i,t}$	0.158	0.153	0.050	0.112	0.213	0.002	0.763
$SGR_{i,t-2}$	0.134	0.410	−0.029	0.064	0.192	−0.619	2.769
$SIZ_{i,t}$	12.893	2.022	11.625	12.859	14.174	7.597	17.871
$CF_{i,t}$	−0.072	0.219	−0.124	0.008	0.054	−1.068	0.215
$NWC_{i,t}$	0.011	0.199	−0.079	0.022	0.127	−0.889	0.464
$CEX_{i,t}$	0.047	0.052	0.013	0.030	0.060	0.000	0.289
$LEV_{i,t}$	0.532	0.270	0.356	0.517	0.666	0.074	1.891
$EN_{i,t}$	−0.004	0.188	0.002	0.031	0.065	−1.217	0.244
$dEN_{i,t}$	0.004	0.126	−0.018	0.004	0.024	−0.567	0.632
$dEN_{i,t+1}$	0.009	0.123	−0.019	0.004	0.026	−0.444	0.667
dNA_{t}	0.032	0.175	−0.032	0.031	0.106	−0.752	0.567
dNA_{t+1}	0.063	0.225	−0.033	0.029	0.112	−0.450	1.308
$RD_{i,t}$	0.023	0.063	0.000	0.000	0.016	0.000	0.427
$dRD_{i,t}$	0.001	0.014	0.000	0.000	0.0004	−0.070	0.074
$dRD_{i,t+1}$	0.001	0.014	0.000	0.000	0.0004	−0.070	0.081
$IN_{i,t}$	0.014	0.021	0.002	0.008	0.018	0.000	0.142
$dIN_{i,t}$	0.000	0.008	−0.001	0.000	0.002	−0.039	0.036
$dIN_{i,t+1}$	0.106	0.191	−0.001	0.016	0.138	−0.101	0.886
$DV_{i,t}$	0.013	0.020	0.000	0.006	0.017	0.000	0.120
$dDV_{i,t}$	0.001	0.010	0.000	0.000	0.002	−0.045	0.048
$dDV_{i,t+1}$	0.001	0.011	0.000	0.000	0.002	−0.044	0.056
$dMV_{i,t}$	0.194	1.054	−0.121	0.044	0.289	−3.013	6.516

Panel B. Annual number of firms

Year	*N*	Year	*N*	Year	*N*	Year	*N*
2004	5,677	2008	7,872	2012	9,236	2016	8,023
2005	6,002	2009	8,238	2013	9,015		
2006	7,047	2010	8,701	2014	8,698		
2007	7,451	2011	9,225	2015	8,289		

Panel C. Industry distribution

Industry	2-Digit SIC	*N*	Industry	2-Digit SIC	*N*
Mineral industries	10–14	5,720	Wholesale trade	50–51	5,366
Construction industries	15–17	3,691	Retail trade	52–59	5,253
Manufacturing	20–39	59,729	Service industries	≥70	16,772
Transportation, communications	40–48	6,943			

Panel D. Country-level data

Country	No. obs	No. firms	MV	XCA	LCA	CAS
Australia	4,165	489	1.849	−0.531	−2.599	0.148
Brazil	1,211	146	1.668	0.024	−2.480	0.135
Canada	4,640	533	1.787	−0.633	−2.837	0.146
Chile	540	69	5.353	−1.019	−2.996	0.072
China	11,804	1,329	2.091	0.079	−2.080	0.162
Spain	782	80	1.431	−0.129	−2.779	0.095
France	3,835	372	1.382	0.111	−2.349	0.139

(*continued*)

Table 1.
Data description

Panel D. Country-level data

Country	No. obs	No. firms	MV	XCA	LCA	CAS
UK	3,753	434	1.675	−0.298	−2.683	0.119
Hong Kong	843	85	1.351	0.215	−2.009	0.188
India	8,401	1,094	1.516	−1.099	−3.221	0.085
Ireland	170	22	1.748	0.220	−2.265	0.170
Italy	1,326	148	1.281	−0.070	−2.619	0.107
Japan	25,280	2,201	1.070	0.239	−2.021	0.174
South Korea	5,283	568	1.048	−0.150	−2.359	0.134
Mexico	525	58	1.461	−0.055	−2.584	0.099
Russia	254	42	2.623	−0.494	−2.819	0.094
Singapore	2,472	303	1.205	0.058	−2.007	0.180
Sweden	1,653	202	1.926	−0.387	−2.608	0.126
USA	26,537	2,825	2.207	−0.003	−2.386	0.189

Note(s): X_t is the value of variable X in year t. dX_t is the annual change in X in year t. dX_{t+1} is the annual change in X in year $t+1$. MV is market value. EXC is excess cash. LNC is the natural logarithm of cash holdings to net assets ratio. CAS is cash holdings. SGR is sale growth. EN is earnings before interest and extraordinary items. NA is net assets calculated by total assets minus total cash and short-term investment. RD is research and development expenditure. IN is interest expense. DV is cash dividend. All firm-level variables except EXC, LNC and SGR are deflated by net assets

Table 1.

cash also fluctuates over a wide range between −3.866 and 1.784. Although the average of excess cash is negative (−0.098), the median value is positive (0.137). This implies that observations with positive excess cash constitute more than 50% of the research sample. In addition, Panel B reports the distribution of the research sample by year. We find that the annual number of firms increases from 2004 to 2012 and then declines slightly in the following years. Panel C illustrates that the largest industry is Manufacturing with 59,729 observations, followed by Service sector (16,777) and Transportation, communications (6,943). The smallest industry is Construction that contributes only 3,691 firm-years. Besides, Panel D shows that there is an unbalanced distribution of observations by across countries. The largest country is the US with 26,537 observations, followed by Japan (25,280) and China (11,804). These three largest countries account for 61.49% of firm-years in the research sample and they may drive our research results. Therefore, we also present results without them as robustness checks.

5. Research results

5.1 Economic policy uncertainty and value of cash during the pre-crisis and the post-crisis periods

Table 2 show regression results to analyze the relationship between economic policy uncertainty and value of cash during the pre-crisis and the post-crisis periods. We find that economic policy uncertainty is negatively related to value of excess cash in the pre-crisis period. This finding is consistent with Attig *et al.* (2021), Drobetz *et al.* (2010). The effect of economic policy uncertainty on cash value relies on investors' views on the role of cash holdings. If investors emphasize on the importance of cash when firms face higher costs of external financing due to high uncertainty, they value cash higher. However, when investors consider high economic policy uncertainty as an opportunity for corporate managers to save more cash for their overinvestment, they value cash lower. Before the global financial crisis, the financial system works normally and thus investors have high incentives to focus on agency cost of cash holdings more than the role of cash holdings in firms' survival and investment.

Variables	Pre-crisis (1)	Pre-crisis (2)	Post-crisis (1)	Post-crisis (2)
Intercept	−0.7679*** (−3.78)	−0.7731*** (−3.18)	1.4009*** (8.12)	1.7236*** (8.57)
$EPU1_t \times EXC_{i,t}$		−0.0101*** (−6.49)		0.0016** (2.30)
$EXC_{i,t}$	0.1139*** (9.83)	−0.0697 (−0.60)	0.0778*** (6.68)	0.5166*** (5.31)
$EPU1_t$		−0.0074*** (−2.70)		0.0034*** (4.04)
$EN_{i,t}$	−2.9430*** (−14.85)	−2.9263*** (−14.79)	−2.8533*** (−15.63)	−2.8327*** (−15.50)
$dEN_{i,t}$	1.3301*** (8.84)	1.3178*** (8.76)	1.0873*** (10.27)	1.0744*** (10.13)
$dEN_{i,t+1}$	−0.5107*** (−3.36)	−0.5044*** (−3.32)	−0.3680*** (−2.98)	−0.3697*** (−2.99)
$dNA_{i,t}$	1.0569*** (13.59)	1.0832*** (13.93)	0.8138*** (12.82)	0.7960*** (12.51)
$dNA_{i,t+1}$	1.2445*** (20.15)	1.2476*** (20.24)	0.8700*** (16.25)	0.8798*** (16.38)
$RD_{i,t}$	4.1138*** (8.54)	4.0423*** (8.29)	5.2713*** (13.25)	5.2740*** (13.20)
$dRD_{i,t}$	3.9851*** (3.26)	3.9071*** (3.19)	6.2545*** (7.49)	6.2472*** (7.48)
$dRD_{i,t+1}$	11.0283*** (10.64)	10.6899*** (10.29)	11.2295*** (13.06)	11.2498*** (13.11)
$IN_{i,t}$	14.3206*** (9.49)	14.3703*** (9.53)	11.8979*** (10.78)	11.8808*** (10.68)
$dIN_{i,t}$	−15.2841*** (−7.08)	−15.0962*** (−6.98)	−16.0610*** (−11.66)	−16.0155*** (−11.61)
$dIN_{i,t+1}$	−0.5213*** (−6.43)	−0.5201*** (−6.42)	−0.0567 (−0.90)	−0.1093* (−1.72)
$DV_{i,t}$	15.7008*** (18.14)	15.6627*** (17.97)	22.2930*** (23.64)	22.0210*** (23.34)
$dDV_{i,t}$	0.1562 (0.15)	0.3695 (0.35)	−2.9837*** (−3.51)	−2.8222*** (−3.30)
$dDV_{i,t+1}$	13.5334*** (12.13)	13.7227*** (12.30)	15.6708*** (17.58)	15.6262*** (17.48)
$dMV_{i,t}$	−0.1129*** (−5.97)	−0.1106*** (−5.84)	0.0135 (0.66)	0.0137 (0.66)
ASD	0.7168*** (6.30)	0.6296*** (5.58)	0.8976*** (9.32)	0.8525*** (9.11)
CRE	−0.1087*** (−5.27)	−0.1096*** (−5.11)	−0.1080*** (−5.77)	−0.0853*** (−4.50)
ROL	0.0353 (1.06)	0.0286 (0.83)	0.0709*** (2.68)	0.0337 (1.22)
$PCRE_t$	−0.0046*** (−7.87)	−0.0047*** (−7.87)	−0.0014*** (−2.93)	−0.0022*** (−4.56)
$MCAP_t$	0.0001 (0.33)	0.0001 (0.43)	−0.0002* (−1.71)	−0.0002 (−1.56)
$GCAP_t$	0.1873*** (10.68)	0.2144*** (10.13)	−0.0614*** (−4.02)	−0.0907*** (−5.18)
$GGRO_t$	0.0609*** (8.90)	0.0703*** (8.93)	0.0206*** (4.64)	0.0160*** (3.58)
$ASD \times EXC_{i,t}$		−0.0359 (−0.42)		0.1087 (1.37)
$CRE \times EXC_{i,t}$		0.0200 (1.16)		0.0246 (1.41)
$ROL \times EXC_{i,t}$		−0.0260 (−0.93)		−0.0483** (−2.36)
$PCREt \times EXC_{i,t}$		−0.0010*** (−2.61)		−0.0011*** (−3.13)
$MCAPt \times EXC_{i,t}$		0.0002 (1.25)		0.0002** (2.29)

(*continued*)

Table 2.
Economic policy uncertainty and value of cash during the pre-crisis and the post-crisis periods

Table 2.

Variables	Pre-crisis (1)	Pre-crisis (2)	Post-crisis (1)	Post-crisis (2)
GCAPt × $EXC_{i,t}$		0.0372*** (3.20)		−0.0457*** (−4.52)
GGROt × $EXC_{i,t}$		−0.0005 (−0.12)		−0.0077 (−3.21)
Industry fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
R^2	0.3902	0.3927	0.2854	0.2880
F-statistics	110.80***	91.22***	102.28***	84.52***
Breusch-Pagan Chi-squared	33,064.96***	33,344.10***	31,945.53***	32,928.02***
N	34,049	34,049	69,425	69,425

Note(s): The dependent variable is MV_t. X_t is the value of variable X in year t. dX_t is the annual change in X in year t. dX_{t+1} is the annual change in X in year $t+1$. MV is market value. EPU1 is economic policy uncertainty. EXC is excess cash. EN is earnings before interest and extraordinary items. NA is net assets calculated by total assets minus total cash and short-term investment. RD is research and development expenditure. IN is interest expense. DV is cash dividend. All firm-level variables except EXC are deflated by net assets. ASD is anti-self-dealing index. CRE is revised creditor right index. ROL is rule of law. PCRE is private credit. MCAP is market capitalization. GCAP is GDP per capita. GGRO is GDP growth rate. * is significant at 10%. ** is significant at 5%. *** is significant at 1%. *t*-statistics are in parentheses

In addition, we find that economic policy uncertainty is positively associated with value of excess cash during the post-crisis period. In line with Arslan *et al.* (2006), Chang *et al.* (2017), Lian *et al.* (2011), under the impact of the global financial crisis, firms experience server external financial constraint and thus investors focus more on the role of cash reserves in firms' survival and investment.

5.2 Robustness checks

The distribution of our research data shows that the three largest countries including the US, Japan and China constitute 61.49% of observations. Therefore, we present all regression results for a reduced sample without them to ensure that these countries fail to drive our research findings. Table 3 reports that economic policy uncertainty still negatively (positively) affects value of excess cash during the pre-crisis (post-crisis) period.

Moreover, we also replace excess cash by cash level measured by cash holdings to net assets ratio and present regression results for this alternative measure as robustness checks. Table 4 shows that our research findings remain unchanged.

Furthermore, following Demir and Ersan (2017), Tran (2019b), we employ alternative measures of economic policy uncertainty as robustness tests. EPU2 is the weighted average of monthly BBD indices in a fiscal year. Those in the first (last) 6 months are assigned a weight of one (two). EPU3 is also the weighted average; however, but BBD indices from the first to the last quarter of a fiscal year are granted corresponding weights from 1 to 4. Regression results presented in Table 5 show consistent findings.

In addition, our research sample is unbalanced panel data; therefore, we also employ panel data regression methods including fixed effects and random effects as robustness checks. Panel data regression is able to control heterogeneity that is not performed by cross-sectional analysis and reduces the risk of biased results. Table 6 shows that our key findings are still stable in both panel data regression techniques.

5.3 The role of firm-level financial constraint in the post-crisis period

Almeida *et al.* (2004) find that financially constrained firms tend to save more cash. Chang *et al.* (2017) document that value of cash is higher in financially constrained firms under the impact of the global financial crisis. Therefore, we continue to investigate how firm-specific financial constraint influences the relationship between economic policy uncertainty and value of cash in the post-crisis period. An observation is defined as financially constrained (unconstrained) if it belongs to the country-year top (bottom) 30^{th} percentile of Kaplan and Zingales (1997) index or Whited and Wu (2006) index or the country-year bottom (top) 30th percentile of firm size.

Table 7 reports regression results to analyze the effect of economic policy uncertainty on value of cash by financial constraint during the post-crisis period. We find that this positive effect is statistically and economically stronger in financially constrained firms. This finding supports the argument that investors more emphasize on the role of cash holdings in firms' survival and investment due to high external financial constraint in the post-crisis period. Financially constrained firms face much higher financial constraint; therefore, investors assign higher value to corporate cash holdings when they face high economic policy uncertainty.

6. Conclusion

Prior studies show that economic policy uncertainty positively affects corporate cash holdings but they have not fully addressed how economic policy uncertainty determines value of cash. Using a research sample of 103,474 firm-years from 19 countries during the

Table 3.
Robustness checks with the reduced sample

Variables	Pre-crisis (1)	Pre-crisis (2)	Post-crisis (1)	Post-crisis (2)
Intercept	1.2425*** (4.81)	1.4178*** (5.21)	1.4706*** (6.58)	2.3417*** (9.55)
$EPU1_t \times EXC_{i,t}$		−0.0122*** (−4.79)		0.0054*** (3.89)
$EXC_{i,t}$	0.1278*** (7.40)	0.2248 (1.47)	0.0592*** (3.18)	0.9074*** (5.86)
$EPU1_t$		−0.0102** (−2.12)		−0.0121*** (−6.14)
$EN_{i,t}$	−2.6538*** (−8.16)	−2.6053*** (−8.00)	−2.6765*** (−9.11)	−2.6248*** (−8.95)
$dEN_{i,t}$	0.9581*** (3.36)	0.9346*** (3.28)	1.0985*** (7.45)	1.0750*** (7.32)
$dEN_{i,t+1}$	−0.6685*** (−2.57)	−0.6575** (−2.52)	−0.5362*** (−3.00)	−0.5428*** (−3.03)
$dNA_{i,t}$	0.9570*** (8.10)	0.9628*** (8.15)	0.6806*** (7.34)	0.6866*** (7.49)
$dNA_{i,t+1}$	0.8626*** (8.71)	0.8515*** (8.64)	0.6865*** (8.41)	0.6925*** (8.58)
$RD_{i,t}$	3.3936*** (3.94)	3.3162*** (3.76)	5.9783*** (8.30)	5.9152*** (8.19)
$dRD_{i,t}$	1.1584 (0.57)	1.1948 (0.58)	2.7091** (2.26)	2.9749** (2.48)
$dRD_{i,t+1}$	9.2341*** (6.03)	9.0433*** (5.89)	9.1341*** (6.93)	9.1362*** (6.93)
$IN_{i,t}$	12.5423*** (4.67)	12.5549*** (4.67)	5.0765*** (3.48)	5.7351*** (3.95)
$dIN_{i,t}$	−21.1116*** (−5.11)	−20.9247*** (−5.04)	−10.0955*** (−5.71)	−9.8230*** (−5.56)
$dIN_{i,t+1}$	−0.1411 (−1.08)	−0.1450 (−1.10)	−0.2479** (−2.49)	−0.2733*** (−2.71)
$DV_{i,t}$	16.6435*** (13.81)	16.7087*** (13.76)	24.8128*** (18.26)	24.4560*** (18.07)
$dDV_{i,t}$	−0.5826 (−0.39)	−0.6645 (−0.44)	−2.5125** (−2.16)	−2.1892* (−1.91)
$dDV_{i,t+1}$	12.6141*** (8.09)	12.5188*** (8.06)	17.4153*** (14.37)	17.2607*** (14.38)
$dMV_{i,t}$	−0.0254 (−0.56)	−0.0233 (−0.52)	0.0508 (1.35)	0.0459 (1.24)
ASD	0.6555*** (4.88)	0.5254*** (4.06)	−0.0949 (−0.76)	0.2404* (1.94)
CRE	−0.1251*** (−4.93)	−0.1339*** (−4.93)	0.0689** (2.10)	−0.0480 (−1.44)
ROL	−0.1489*** (−2.67)	−0.1479** (−2.53)	−0.2067*** (−5.66)	−0.1962*** (−4.81)
$PCRE_t$	0.0004 (0.45)	0.0007 (0.81)	−0.0052*** (−3.43)	−0.0022* (−1.68)
$MCAP_t$	−0.0001 (−0.37)	0.0000 (0.09)	0.0002 (1.08)	0.0001 (0.37)
$GCAP_t$	−0.0425* (−1.80)	−0.0315 (−1.15)	0.0025 (0.08)	−0.0851*** (−2.92)
$GGRO_t$	−0.0069 (−0.64)	−0.0033 (−0.29)	−0.0129* (−1.79)	−0.0154** (−2.26)
$ASD \times EXC_{i,t}$		0.0271 (0.27)		0.2931*** (3.59)
$CRE \times EXC_{i,t}$		−0.0137 (−0.66)		−0.1137*** (−5.20)
$ROL \times EXC_{i,t}$		0.0184 (0.37)		−0.0097 (−0.39)
$PCRE_t \times EXC_{i,t}$		0.0003 (0.40)		0.0072*** (5.46)
$MCAP_t \times EXC_{i,t}$		0.0002 (1.56)		−0.0006*** (−4.66)
$GCAP_t \times EXC_{i,t}$		−0.0016 (−0.09)		−0.1718*** (−6.23)
$GGRO_t \times EXC_{i,t}$		−0.0038 (−0.62)		0.0208*** (4.64)

(*continued*)

Variables	Pre-crisis		Post-crisis	
	(1)	(2)	(1)	(2)
Industry fixed effects		Yes		Yes
Year fixed effects		Yes		Yes
R^2	0.2804	0.2841	0.1935	0.2075
F-statistics	33.13***	29.52***	31.37***	27.26***
Breusch-Pagan Chi-squared	6,373.70***	6,448.94***	9,325.07***	12,868.09***
N	9,930	9,930	29,923	29,923

Note(s): The dependent variable is MV_t. X_t is the value of variable X in year t. dX_t is the annual change in X in year t. dX_{t+1} is the annual change in X in year $t+1$. MV is market value. EPU1 is economic policy uncertainty. EXC is excess cash. EN is earnings before interest and extraordinary items. NA is net assets calculated by total assets minus total cash and short-term investment. RD is research and development expenditure. IN is interest expense. DV is cash dividend. All firm-level variables except EXC are deflated by net assets. ASD is anti-self-dealing index. CRE is revised creditor right index. ROL is rule of law. PCRE is private credit. MCAP is market capitalization. GCAP is GDP per capita. GGRO is GDP growth rate. * is significant at 10%. ** is significant at 5%. *** is significant at 1%. *t*-statistics are in parentheses

Table 3.

Table 4.
Robustness checks with cash level

Variables	Pre-crisis (1)	Pre-crisis (2)	Post-crisis (1)	Post-crisis (2)
Intercept	−0.8788*** (−4.36)	0.0467 (0.21)	1.1102*** (6.52)	0.7626*** (4.13)
$EPU1_t \times CAS_{i,t}$		−0.0782*** (−5.01)		0.0166** (2.37)
$CAS_{i,t}$	1.5273*** (11.06)	−4.3714*** (−2.98)	1.3109*** (12.66)	7.6894*** (5.69)
$EPU1_t$		0.0058* (1.73)		−0.0012 (−0.87)
$EN_{i,t}$	−2.8072*** (−14.20)	−2.7647*** (−14.00)	−2.7396*** (−15.15)	−2.7535*** (−15.22)
$dEN_{i,t}$	1.2413*** (8.21)	1.2184*** (8.04)	1.0386*** (9.83)	1.0260*** (9.76)
$dEN_{i,t+1}$	−0.4042*** (−2.66)	−0.3917*** (−2.59)	−0.2706** (−2.21)	−0.2869** (−2.34)
$dNA_{i,t}$	1.1700*** (14.79)	1.1827*** (15.03)	0.9249*** (14.55)	0.9341*** (14.73)
$dNA_{i,t+1}$	1.1328*** (18.27)	1.1275*** (18.16)	0.7753*** (14.23)	0.7836*** (14.43)
$RD_{i,t}$	3.1174*** (6.04)	3.1841*** (6.03)	4.3938*** (10.58)	4.5600*** (10.77)
$dRD_{i,t}$	3.9015*** (3.15)	3.8017*** (3.08)	6.3842*** (7.59)	6.2738*** (7.51)
$dRD_{i,t+1}$	9.7002*** (9.23)	8.7791*** (8.37)	10.4447*** (12.05)	10.6216*** (12.28)
$IN_{i,t}$	16.2301*** (10.59)	16.3395*** (10.69)	13.6422*** (12.44)	13.8701*** (12.63)
$dIN_{i,t}$	−15.6201*** (−7.22)	−15.6242*** (−7.22)	−16.4708*** (−11.98)	−16.2816*** (−11.94)
$dIN_{i,t+1}$	−0.3207*** (−4.05)	−0.3265*** (−4.12)	0.1396** (2.14)	0.0842 (1.29)
$DV_{i,t}$	15.4345*** (17.87)	15.4594*** (17.84)	21.8440*** (23.38)	21.5485*** (23.50)
$dDV_{i,t}$	−0.1205 (−0.12)	−0.2352 (−0.23)	−3.2416*** (−3.85)	−3.1778*** (−3.79)
$dDV_{i,t+1}$	12.9624*** (11.67)	13.1063*** (11.92)	15.0488*** (17.14)	14.7940*** (16.91)
$dMV_{i,t}$	−0.1087*** (−5.79)	−0.1039*** (−5.55)	0.0123 (0.60)	0.0125 (0.61)
ASD	0.5600*** (5.01)	0.8737*** (6.09)	0.8401*** (8.76)	0.5579*** (3.94)
CRE	−0.1120*** (−5.47)	−0.1766*** (−6.01)	−0.1045*** (−5.57)	−0.0692** (−2.43)
ROL	0.0215 (0.65)	0.0536 (1.15)	0.0743*** (2.84)	0.0441 (1.22)
$PCRE_t$	−0.0039*** (−6.85)	−0.0017** (−2.34)	−0.0011** (−2.40)	−0.0013** (−2.04)
$MCAP_t$	0.0001 (0.42)	0.0002 (1.16)	−0.0002* (−1.93)	0.0001 (0.31)
$GCAP_t$	0.1742*** (10.16)	0.0629*** (2.75)	−0.0604*** (−4.00)	0.0118 (0.68)
$GGRO_t$	0.0570*** (8.43)	0.0128 (1.41)	0.0202*** (4.59)	0.0082 (1.63)
$ASD \times EXC_{i,t}$		−2.7630*** (−2.87)		1.5501** (2.00)
$CRE \times EXC_{i,t}$		0.3902* (1.82)		−0.1220 (−0.71)
$ROL \times EXC_{i,t}$		−0.4344 (−1.53)		0.0331 (0.14)
$PCRE_t \times EXC_{i,t}$		−0.0147*** (−3.42)		−0.0033 (−0.97)
$MCAP_t \times EXC_{i,t}$		−0.0006 (−0.60)		−0.0012* (−1.89)

(*continued*)

Table 4.

Variables	Pre-crisis (1)	Pre-crisis (2)	Post-crisis (1)	Post-crisis (2)
$GCAP_t \times EXC_{i,t}$		0.8209*** (5.74)		−0.7007*** (−5.62)
$GGRO_t \times EXC_{i,t}$		0.3439*** (6.95)		0.0405** (2.00)
Industry fixed effects		Yes		Yes
Year fixed effects		Yes		Yes
R^2	0.3998	0.4057	0.2927	0.2978
F-statistics	111.86***	95.77***	103.54***	87.46***
Breusch-Pagan Chi-squared	37,059.57***	37,588.59***	34,537.10***	35,337.27***
N	34,049	34,049	69,425	69,425

Note(s): The dependent variable is MV_t. X_t is the value of variable X in year t. dX_t is the annual change in X in year t. dX_{t+1} is the annual change in X in year $t+1$. MV is market value. EPU1 is economic policy uncertainty. CAS is cash holdings. EN is earnings before interest and extraordinary items. NA is net assets calculated by total assets minus total cash and short-term investment. RD is research and development expenditure. IN is interest expense. DV is cash dividend. All firm-level variables except CAS are deflated by net assets. ASD is anti-self-dealing index. CRE is revised creditor right index. ROL is rule of law. PCRE is private credit. MCAP is market capitalization. GCAP is GDP per capita. GGRO is GDP growth rate. * is significant at 10%. ** is significant at 5%. *** is significant at 1%. *t*-statistics are in parentheses

Table 5.
Robustness checks with alternative measures of economic policy uncertainty

Variables	Pre-crisis		Post-crisis	
	EP_uncertainty is EPU2	EP_uncertainty is EPU3	EP_uncertainty is EPU2	EP_uncertainty is EPU3
Intercept	−0.7487*** (−3.06)	−0.7397*** (−3.04)	1.7836*** (8.89)	1.7265*** (8.59)
$EP\_uncertainty_t \times EXC_{i,t}$	−0.0087*** (−6.43)	−0.0091*** (−6.47)	0.0029*** (3.63)	0.0013* (1.91)
$EXC_{i,t}$	−0.0599 (−0.50)	−0.0425 (−0.36)	0.4725*** (4.89)	0.5299*** (5.45)
$EP\_uncertainty_t$	−0.0031 (−1.27)	−0.0032 (−1.22)	0.0021** (2.23)	0.0034*** (4.07)
$EN_{i,t}$	−2.9303*** (−14.81)	−2.9308*** (−14.81)	−2.8302*** (−15.48)	−2.8327*** (−15.49)
$dEN_{i,t}$	1.3205*** (8.77)	1.3206*** (8.77)	1.0742*** (10.13)	1.0743*** (10.13)
$dEN_{i,t+1}$	−0.5059*** (−3.33)	−0.5060*** (−3.33)	−0.3696*** (−2.99)	−0.3698*** (−2.99)
$dNA_{i,t}$	1.0817*** (13.92)	1.0818*** (13.92)	0.7978*** (12.55)	0.7962*** (12.52)
$dNA_{i,t+1}$	1.2501*** (20.27)	1.2504*** (20.28)	0.8797*** (16.38)	0.8797*** (16.37)
$RD_{i,t}$	4.0421*** (8.28)	4.0425*** (8.29)	5.2861*** (13.24)	5.2753*** (13.20)
$dRD_{i,t}$	3.9078*** (3.19)	3.9055*** (3.19)	6.2629*** (7.50)	6.2464*** (7.48)
$dRD_{i,t+1}$	10.7147*** (10.31)	10.7104*** (10.30)	11.2443*** (13.10)	11.2508*** (13.11)
$IN_{i,t}$	14.3359*** (9.50)	14.3360*** (9.49)	11.9682*** (10.77)	11.8894*** (10.70)
$dIN_{i,t}$	−15.0583*** (−6.96)	−15.0627*** (−6.96)	−16.0101*** (−11.61)	−16.0270*** (−11.62)
$dIN_{i,t+1}$	−0.5224*** (−6.44)	−0.5221*** (−6.44)	−0.1036 (−1.63)	−0.1082* (−1.70)
$DV_{i,t}$	15.6800*** (17.98)	15.6806*** (17.99)	22.0104*** (23.33)	22.0191*** (23.33)
$dDV_{i,t}$	0.3682 (0.35)	0.3713 (0.35)	−2.7972*** (−3.28)	−2.8249*** (−3.31)
$dDV_{i,t+1}$	13.7416*** (12.32)	13.7467*** (12.32)	15.6480*** (17.51)	15.6183*** (17.47)
$dMV_{i,t}$	−0.1117*** (−5.91)	−0.1118*** (−5.92)	0.0129 (0.62)	0.0137 (0.66)
ASD	0.6688*** (5.89)	0.6713*** (5.90)	0.8881*** (9.47)	0.8552*** (9.15)
CRE	−0.1071*** (−5.01)	−0.1071*** (−5.01)	−0.0942*** (−4.98)	−0.0860*** (−4.54)
ROL	0.0238 (0.69)	0.0216 (0.63)	0.0372 (1.34)	0.0337 (1.22)
$PCRE_t$	−0.0047*** (−7.94)	−0.0047*** (−7.97)	−0.0020*** (−4.16)	−0.0022*** (−4.52)
$MCAP_t$	0.0000 (0.28)	0.0000 (0.28)	−0.0002 (−1.63)	−0.0002 (−1.55)
$GCAP_t$	0.2058*** (9.85)	0.2049*** (9.88)	−0.0965*** (−5.52)	−0.0910*** (−5.20)
$GGRO_t$	0.0662*** (8.48)	0.0660*** (8.49)	0.0150*** (3.34)	0.0162*** (3.61)
$ASD \times EXC_{i,t}$	−0.0254 (−0.30)	−0.0191 (−0.22)	0.0984 (1.24)	0.1156 (1.45)
$CRE \times EXC_{i,t}$	0.0216 (1.26)	0.0221 (1.29)	0.0284* (1.65)	0.0227 (1.29)
$ROL \times EXC_{i,t}$	−0.0216 (−0.80)	−0.0239 (−0.88)	−0.0475** (−2.32)	−0.0475** (−2.33)
$PCRE_t \times EXC_{i,t}$	−0.0011*** (−2.76)	−0.0011*** (−2.83)	−0.0012*** (−3.40)	−0.0011*** (−3.02)

(*continued*)

Table 5.

Variables	Pre-crisis		Post-crisis	
	EP_uncertainty is EPU2	EP_uncertainty is EPU3	EP_uncertainty is EPU2	EP_uncertainty is EPU3
$MCAP_t \times EXC_{i,t}$	0.0002 (1.24)	0.0002 (1.20)	0.0002** (2.35)	0.0002** (2.27)
$GCAP_t \times EXC_{i,t}$	0.0351*** (3.01)	0.0336*** (2.89)	−0.0438*** (−4.38)	−0.0467*** (−4.61)
$GGRO_t \times EXC_{i,t}$	−0.0017 (−0.38)	−0.0024 (−0.54)	−0.0067*** (−2.78)	−0.0079*** (−3.31)
Industry fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
R^2	0.3925	0.3925	0.2880	0.2880
F-statistics	91.15***	91.11***	84.61***	84.55***
Breusch-Pagan Chi-squared	33,288.96***	33,279.44***	32,952.45***	32,942.90***
N	34,049	34,049	69,425	69,425

Note(s): The dependent variable is MV_t. X_t is the value of variable X in year t. dX_t is the annual change in X in year t. dX_{t+1} is the annual change in X in year $t+1$. MV is market value. EP_uncertainty is economic policy uncertainty. EPU2 and EPU3 are alternative measures of economic policy uncertainty. EXC is excess cash. EN is earnings before interest and extraordinary items. NA is net assets calculated by total assets minus total cash and short-term investment. RD is research and development expenditure. IN is interest expense. DV is cash dividend. All firm-level variables except EXC are deflated by net assets. ASD is anti-self-dealing index. CRE is revised creditor right index. ROL is rule of law. PCRE is private credit. MCAP is market capitalization. GCAP is GDP per capita. GGRO is GDP growth rate. * is significant at 10%. ** is significant at 5%. *** is significant at 1%. t-statistics are in parentheses

Table 6.
Robustness checks with panel data regression

Variables	Fixed effects		Random effects	
	Pre-crisis	Post-crisis	Pre-crisis	Post-crisis
Intercept	−5.2584*** (−5.97)	−0.3837 (−0.52)	−1.2984*** (−5.74)	1.6700*** (10.06)
$EPU1_t \times CAS_{i,t}$	−0.0075*** (−4.33)	0.0006** (2.23)	−0.0081*** (−5.36)	0.0004** (2.27)
$CAS_{i,t}$	−0.0085*** (−3.79)	−0.0028*** (−4.34)	−0.0055*** (−2.77)	−0.0015** (−2.23)
$EPU1_t$	−0.5432*** (−2.75)	0.0487 (0.58)	−0.2302* (−1.88)	0.1382* (1.94)
$EN_{i,t}$	−1.5694*** (−5.81)	−0.8716*** (−5.44)	−2.0999*** (−10.56)	−1.4244*** (−9.96)
$dEN_{i,t}$	0.8115*** (5.25)	0.4946*** (6.35)	0.9522*** (6.98)	0.6064*** (8.21)
$dEN_{i,t+1}$	−0.1983 (−1.36)	0.1332 (1.39)	−0.3701*** (−2.91)	−0.0973 (−1.07)
$dNA_{i,t}$	0.3507*** (5.27)	0.2750*** (5.90)	0.6067*** (10.07)	0.4190*** (9.60)
$dNA_{i,t+1}$	1.2894*** (20.32)	1.1636*** (24.70)	1.2662*** (23.64)	1.1193*** (26.91)
$RD_{i,t}$	3.7630*** (3.96)	4.6328*** (7.87)	4.5417*** (8.43)	5.7525*** (13.80)
$dRD_{i,t}$	1.8131* (1.83)	2.0318*** (3.31)	2.1347** (2.30)	2.1624*** (3.63)
$dRD_{i,t+1}$	6.8916*** (6.72)	7.3016*** (10.65)	8.2718*** (9.89)	8.3229*** (13.36)
$IN_{i,t}$	11.0703*** (5.91)	7.7414*** (6.44)	13.9476*** (9.77)	10.4764*** (10.54)
$dIN_{i,t}$	−9.5792*** (−5.40)	−8.2983*** (−7.75)	−11.5644*** (−7.03)	−10.2254*** (−10.18)
$dIN_{i,t+1}$	−0.6356*** (−4.15)	−0.4322*** (−3.89)	−0.5208*** (−5.54)	−0.2286*** (−2.83)
$DV_{i,t}$	3.8434*** (2.99)	10.5640*** (12.87)	10.4084*** (11.54)	13.6203*** (19.48)
$dDV_{i,t}$	2.8420*** (3.50)	−1.3147** (−2.34)	0.8017 (1.03)	−2.1735*** (−4.09)
$dDV_{i,t+1}$	5.6033*** (6.40)	7.8455*** (13.30)	9.2963*** (11.75)	9.5595*** (16.69)
$dMV_{i,t}$	−0.2787*** (−22.05)	−0.2541*** (−21.15)	−0.2459*** (−19.14)	−0.2323*** (−19.21)
ASD			0.4270*** (3.56)	1.4126*** (14.27)
CRE			−0.0922*** (−4.05)	−0.2053*** (−10.37)
ROL	−0.0420 (−1.46)	−0.0775*** (−3.61)	−0.0086 (−0.30)	−0.0085 (−0.39)
$PCRE_t$	−0.0030*** (−2.66)	0.0036*** (4.82)	−0.0047*** (−8.60)	0.0012*** (2.72)
$MCAP_t$	0.0017*** (5.48)	0.0021*** (5.89)	0.0009*** (4.27)	−0.0002* (−1.87)
$GCAP_t$	0.6478*** (7.66)	0.2834*** (4.91)	0.2604*** (12.66)	−0.0765*** (−5.19)
$GGRO_t$	0.0875*** (10.31)	0.0143*** (4.83)	0.1036*** (13.98)	0.0148*** (5.20)
$ASD \times EXC_{i,t}$	0.1817 (1.17)	0.0217 (0.26)	0.0277 (0.27)	0.0712 (1.01)
$CRE \times EXC_{i,t}$	−0.0383 (−1.54)	0.0142 (0.86)	−0.0072 (−0.42)	0.0136 (0.95)
$ROL \times EXC_{i,t}$	−0.0202 (−0.94)	0.0064 (0.41)	−0.0298 (−1.42)	0.0031 (0.21)
$PCRE_t \times EXC_{i,t}$	0.0002 (0.35)	−0.0010*** (−2.90)	−0.0004 (−1.10)	−0.0010*** (−3.36)
$MCAP_t \times EXC_{i,t}$	−0.0006** (−2.05)	0.0002** (2.07)	−0.0003 (−1.25)	0.0002** (2.48)

(*continued*)

Variables	Fixed effects		Random effects	
	Pre-crisis	Post-crisis	Pre-crisis	Post-crisis
$GCAP_t \times EXC_{i,t}$	0.0604*** (3.25)	0.0035 (0.38)	0.0439*** (3.57)	−0.0088 (−1.12)
$GGRO_t \times EXC_{i,t}$	0.0171*** (3.69)	−0.0023 (−1.39)	0.0105*** (2.61)	−0.0026 (−1.62)
Industry fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
N	34,049	69,425	34,049	69,425

Note(s): The dependent variable is MV_t. X_t is the value of variable X in year t. dX_t is the annual change in X in year t. dX_{t+1} is the annual change in X in year $t+1$. MV is market value. EPU1 is economic policy uncertainty. CAS is cash holdings. EN is earnings before interest and extraordinary items. NA is net assets calculated by total assets minus total cash and short-term investment. RD is research and development expenditure. IN is interest expense. DV is cash dividend. All firm-level variables except CAS are deflated by net assets. ASD is anti-self-dealing index. CRE is revised creditor right index. ROL is rule of law. PCRE is private credit. MCAP is market capitalization. GCAP is GDP per capita. GGRO is GDP growth rate. * is significant at 10%. ** is significant at 5%. *** is significant at 1%. *t*-statistics are in parentheses

Table 6.

Table 7.
The effect of economic policy uncertainty on value of cash by financial constraint during the post-crisis period

Variables	KZ index		WW index		Firm size	
	Low	High	Low	High	Large	Small
Intercept	1.9086*** (5.73)	1.0306*** (2.84)	0.0020** (2.30)	0.0070*** (3.72)	1.8025*** (7.11)	2.7450*** (6.00)
$EPU1_t \times EXC_{i,t}$	0.0034*** (2.79)	0.0044*** (2.59)	−0.0001 (−0.11)	0.0070*** (3.25)	0.0020** (2.28)	0.0067*** (3.49)
$EXC_{i,t}$	0.0063 (0.03)	0.4521** (2.56)	1.5987** (2.24)	−3.4905*** (−18.02)	0.2455* (1.87)	0.8797*** (4.47)
$EPU1_t$	−0.0004 (−0.22)	0.0082*** (3.68)	0.2870** (2.22)	0.7752*** (4.02)	−0.0012 (−1.13)	0.0083*** (3.67)
$EN_{i,t}$	−1.0801*** (−3.22)	−3.8750*** (−17.12)	0.2413 (0.77)	0.8446*** (6.55)	4.1613*** (8.85)	−3.4315*** (−17.32)
$dEN_{i,t}$	1.2553*** (6.88)	0.8960*** (5.39)	1.8176*** (4.47)	−1.0406*** (−7.32)	−0.3075** (−2.17)	0.8167*** (6.16)
$dEN_{i,t+1}$	0.5536** (2.50)	−1.0030*** (−5.45)	0.6305*** (5.80)	1.0187*** (9.35)	3.0249*** (13.42)	−1.0349*** (−7.17)
$dNA_{i,t}$	0.7796*** (6.48)	0.7456*** (6.87)	0.4886*** (4.99)	1.2251*** (13.36)	0.1219** (1.96)	0.9174*** (8.19)
$dNA_{i,t+1}$	0.7684*** (9.04)	1.2331*** (11.68)	8.0070*** (10.11)	3.7589*** (7.45)	0.1969** (2.46)	1.2011*** (12.76)
$RD_{i,t}$	5.6166*** (11.90)	5.0257*** (6.94)	9.0352*** (3.25)	5.0033*** (4.92)	5.8849*** (5.51)	3.8438*** (7.33)
$dRD_{i,t}$	7.1493*** (6.23)	3.0815** (1.98)	15.0993*** (5.57)	8.3691*** (8.07)	7.6366*** (3.42)	4.9940*** (4.91)
$dRD_{i,t+1}$	12.1243*** (11.40)	9.0252*** (5.32)	5.6439*** (3.59)	17.2513*** (11.09)	12.7415*** (5.40)	8.3741*** (7.60)
$IN_{i,t}$	17.5443*** (9.10)	9.3041*** (5.80)	−8.3035*** (−2.68)	−17.8582*** (−9.20)	5.3514*** (5.22)	18.9171*** (11.37)
$dIN_{i,t}$	−13.5644*** (−4.93)	−16.0409*** (−8.03)	0.0574 (0.80)	−0.5025*** (−3.76)	−4.1574** (−2.38)	−18.6636*** (−9.21)
$dIN_{i,t+1}$	−0.1771* (−1.74)	−0.3249*** (−2.94)	19.6909*** (12.39)	26.1928*** (10.38)	0.2182*** (2.92)	−0.4258** (−2.55)
$DV_{i,t}$	18.8544*** (16.29)	53.9883*** (6.12)	−0.9581 (−0.88)	−8.3586*** (−3.42)	14.8932*** (10.94)	24.4272*** (12.70)
$dDV_{i,t}$	−0.0293 (−0.03)	−16.0536*** (−4.26)	14.1744*** (9.93)	15.5222*** (7.69)	−2.0077** (−2.11)	−6.8930*** (−3.38)
$dDV_{i,t+1}$	14.4255*** (12.25)	21.8134*** (6.39)	−0.1347*** (−2.78)	−0.0049 (−0.17)	10.1555*** (8.51)	16.3502*** (9.76)
$dMV_{i,t}$	−0.0221 (−0.85)	−0.0102 (−0.26)	0.2778* (1.92)	1.6759*** (8.48)	−0.1447*** (−3.13)	−0.0258 (−1.00)
ASD	1.1642*** (8.20)	−0.0670 (−0.25)	0.0400* (1.79)	−0.2755*** (−6.32)	0.1237 (0.75)	1.8760*** (8.94)
CRE	−0.1386*** (−5.15)	0.0720 (1.17)	−0.1365*** (−3.43)	0.1842*** (2.75)	0.0464** (2.08)	−0.3074*** (−6.39)
ROL	−0.0058 (−0.11)	0.0341 (0.57)	−0.0051*** (−9.54)	0.0035*** (3.25)	−0.0965*** (−2.82)	0.1565** (2.30)
$PCRE_t$	−0.0011 (−1.55)	−0.0058*** (−3.70)	0.0003 (0.99)	−0.0009*** (−5.28)	−0.0042*** (−7.36)	0.0040*** (3.49)
$MCAP_t$	−0.0005*** (−4.52)	0.0005* (1.89)	−0.0918*** (−3.83)	−0.1713*** (−4.91)	0.0004 (1.06)	−0.0012*** (−6.27)
$GCAP_t$	−0.1529*** (−5.18)	−0.0192 (−0.50)	−0.0155*** (−2.66)	0.0374*** (3.87)	−0.0556** (−2.19)	−0.2339*** (−6.53)
$GGRO_t$	0.0258*** (3.38)	−0.0174 (−1.56)	0.2011 (1.35)	0.0841 (0.58)	−0.0038 (−0.56)	0.0380*** (4.05)
$ASD \times EXC_{i,t}$	−0.1123 (−0.91)	−0.0841 (−0.55)	0.0184 (0.84)	0.0257 (0.72)	0.2919* (1.70)	0.2064 (1.29)
$CRE \times EXC_{i,t}$	0.1082*** (4.34)	0.0499 (1.48)	0.0289 (1.06)	−0.1412*** (−2.87)	0.0211 (0.96)	−0.0004 (−0.01)
$ROL \times EXC_{i,t}$	−0.0742* (−1.67)	−0.1227*** (−2.81)	−0.0007 (−1.76)	−0.0002 (−0.26)	0.0707*** (2.84)	−0.1054 (−2.16)
$PCRE_t \times EXC_{i,t}$	−0.0036*** (−5.85)	−0.0014* (−1.97)	−0.0001 (−0.30)	0.0002 (1.37)	−0.0011** (−2.56)	−0.0001 (−0.09)
$MCAP_t \times EXC_{i,t}$	0.0002 (1.31)	0.0003 (1.52)	−0.0360** (−2.43)	−0.0866*** (−4.22)	−0.0002 (−0.80)	0.0002 (0.93)

(*continued*)

Variables	KZ index		WW index		Firm size	
	Low	High	Low	High	Large	Small
$GCAP_t \times EXC_{i,t}$	0.0362* (1.83)	−0.0375*** (−2.00)	−0.0084** (−2.40)	−0.0032 (−0.63)	−0.0353** (−2.28)	−0.1002*** (−4.70)
$GGRO_t \times EXC_{i,t}$	−0.0049 (−1.15)	−0.0157*** (−3.08)	2.2630*** (8.18)	1.7347*** (4.75)	−0.0128*** (−3.28)	−0.0040 (−0.74)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.3089	0.3294	0.3107	0.3585	0.3008	0.36
N	20,846	21,004	20,885	20,911	20,897	20,897

Note(s): The dependent variable is MV_t. X_t is the value of variable X in year t. dX_t is the annual change in X in year t. dX_{t+1} is the annual change in X in year $t+1$. MV is market value. EPU1 is economic policy uncertainty. EXC is excess cash. EN is earnings before interest and extraordinary items. NA is net assets calculated by total assets minus total cash and short-term investment. RD is research and development expenditure. IN is interest expense. DV is cash dividend. All firm-level variables except EXC are deflated by net assets. ASD is anti-self-dealing index. CRE is revised creditor right index. ROL is rule of law. PCRE is private credit. MCAP is market capitalization. GCAP is GDP per capita. GGRO is GDP growth rate. * is significant at 10%. ** is significant at 5%. *** is significant at 1%. *t*-statistics are in parentheses

Table 7.

period 2004–2016, we find that economic policy uncertainty is negatively (positively) related to value of cash in the pre-crisis (post-crisis) period. These findings imply that investors pay more attention to agency costs (precautionary motive and transaction motive) than precautionary motive and transaction motive (agency costs) of cash holdings in the pre-crisis (post-crisis) period. Moreover, we also document that the positive effect of economic policy uncertainty in the post-crisis period is stronger in financially constrained firms.

This paper contributes to the literature of corporate cash holdings and financial crisis. While prior studies focus on the effect of economic policy uncertainty on cash levels, we show that economic policy uncertainty also determines value of cash across countries. In addition, we extend the line of research on how a financial crisis affects corporate financial decisions by showing that the effect of economic policy uncertainty on cash value are different before and after the financial crisis. These understandings help investors in their investment decisions under normal economic conditions (before a financial crisis) and in the post-crisis period. Future research may investigate how the Covid-19 pandemic affects the relationship between economic policy uncertainty and value of cash.

Note

1. Our research findings remain stable with 3% and 5% of winsorization.

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Appendix 1

Appendix 1 is avaialble at https://www.emerald.com/insight/content/doi/10.1108/EJMBE-10-2020-0292/full/html

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The route to well-being at workplace: examining the role of job insecurity and its antecedents

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Abstract

Purpose – The current study focuses on the role of antecedents to prevent perceived job insecurity and mitigate its negative impacts on work-related well-being. The study examined variables of the resourceful environment (effective organizational communication and involvement), conserved resources (perceived employability and emotional exhaustion) and resource loss (job insecurity) by drawing on the Conservation of Resources (COR) theory for predicting the work-related well-being adding the moderating role of boundaryless career orientation.

Design/methodology/approach – A sample of 306 salespersons of pharmaceutical companies working in Pakistan was obtained. The hypothesized relationships were tested through structural equation modeling in SmartPLS.

Findings – The results confirmed showed that the organizational communication, employee involvement and perceived employability reduce the perceived job insecurity; however, the emotional exhaustion was positively related. It also confirmed the moderating effect of boundaryless career orientation on relationship of job insecurity and well-being.

Practical implications – To make employees engaged, the organizations are required to involve employees by sharing knowledge, information and power to make decisions, value their opinion and ensuring the employability. Further, salespersons having a preference of a boundaryless career proved to mitigate negative impact of job insecurity on work-related well-being.

Originality/value – Many empirical studies have identified that the perceived job insecurity is one of the major concerns affecting employee's well-being. However, few studies simultaneously have sought to prevent the perceived job insecurity among employees. The findings are important in developing the understanding that how salespersons perceive their capabilities and the work environment of the organization, this perception; resultantly, can influence their behaviors particularly the work engagement dimension of well-being.

Keywords Perceived job insecurity, Salespersons, Work engagement, Work related well-being, Boundaryless career orientation

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1. Introduction

In the past few years, there has been a constant rise in the studies on workplace well-being (Kowalski and Loretto, 2017; Diener *et al.*, 2018). The surge in this trend is based on the findings that happy employees are more productive employees (Miller, 2016; Warr and Nielsen, 2018). Health and well-being have also been adopted by the United Nations as the third Goal out of seventeen "Goals of Sustainable Development" (United Nations, 2015), which calls for healthy lives and well-being for all and at all ages. It is recognized that the good health and well-being of individuals depend on and contribute to the other Goals of Sustainable Development such as sustaining social justice, economic growth and environmental protection. The current investigations have become more relevant especially after the coronavirus disease 2019 (COVID-19) outbreak against which the individuals in organizations are facing limited social and work support, increased work pressure and asymmetrical working hours (Blake *et al.*, 2010; International Labor Organization, 2020).

In an organizational milieu, well-being embraces the worker's physical, mental, emotional and spiritual health (Mirabito and Berry, 2015). Researchers have proposed the factors such as psychological capital, job satisfaction, organizational commitment and role of leader/supervisor to contribute to well-being at work in any given organizational and cultural context (Avey *et al.*, 2010; Kumar and Giri, 2009; Chughtai *et al.*, 2015). At the same time, job insecurity is consistently proven to damage both the mental and physical health and well-being of employees (Richter *et al.*, 2014; De Witte *et al.*, 2016). At the individual level, perceptions of job insecurity affect the physical health and well-being negatively, whereas at the organizational level it results in reduced work engagement and poor work behaviors (Richter, 2011; Vander Elst *et al.*, 2012; Nella *et al.*, 2015; Jiang and Lavaysse, 2018). Researchers in the field have almost unanimously affirmed that the perceptions of job insecurity must be reduced and ultimately prevented for the betterment of individual employees and the organization's health. Sjöberg (2018) has regarded perceived job insecurity as the disease of the 21st century. Growing research has documented its detrimental effects on employee's health and well-being (Cheng *et al.*, 2012; Jiang and Probst, 2016; Witte, 2016).

However, most job insecurity research is conducted in the Western context (Wang *et al.*, 2014). As perceived job insecurity has become a worldwide concern (Cheng *et al.*, 2012), Pakistan has no exemption to it. Job insecurity is a subjective perceptual experience and perceptions largely arise from the work environment of employees (Qureshi and Khan, 2016). In Pakistan where the majority of people are facing unemployment, persons having jobs, are facing tough competition at one hand and threats of job loss on the other hand. There exists empirical evidence that job insecurity has been experienced as a common phenomenon in the private sector organizations of Pakistan (Awan and Salam, 2014; Qureshi and Khan, 2016). Drawing on the sample of private college teachers, Awan and Salam (2014) concluded that there exists a negative relationship among age, performance and job insecurity. In response to the call of filling in the gaps in the meta-analysis by Shoss (2017), who recommended additional studies to expand knowledge of antecedents as well as the consequences of job insecurity, the current study investigates whether organizational communication, employee involvement, perceived employability and emotional exhaustion are associated with job insecurity perception among the salespersons in pharmaceutical companies as job insecurity is the major concern in many industries; including pharmaceuticals employ salespersons (Chaker *et al.*, 2016). Vander Elst *et al.* (2010) recognized through a broad study that organizational communication and participation relate negatively to job insecurity. Likewise, Huang *et al.* (2012) disclosed that employment involvement practices of information sharing, inclusion in decision-making as well as group goals reduce perceptions of job insecurity. Likewise, exhausted employees possess little emotional and physical resources (Maslach *et al.*, 2001), which reduce employees' control and may raise negative emotions and attitudes (Jiang and Probst, 2016). Another variable which Shoss (2017) suggested in meta-analysis is

perceived employability. Workers who experience job insecurity due to lack of perceived employability have increased risk of deviant behaviors and intentions to leave (De Cuyper *et al.*, 2009; Huang *et al.*, 2017). Additionally, these variables have buffering effects on several negative effects of job insecurity (Jiang and Probst, 2014; Schreurs *et al.*, 2012; Wang *et al.*, 2015). If not mitigated these variables can ultimately harm well-being and job attitudes (De Cuyper *et al.*, 2014; Hewlin *et al.*, 2016). Additionally, little is known about mitigating the negative effects of perceived insecurity on work-related well-being (Cheung *et al.*, 2016). Therefore, it is suggested that by taking "boundaryless career orientation" like pursuing educational opportunities, the negative effect of job insecurity can be mitigated (Klehe *et al.*, 2012; Shoss, 2017). Hence, the study examines boundaryless career orientation as a moderator on the job insecurity well-being association. To the best of our knowledge, this study is the first to investigate the effect of job insecurity on well-being, particularly in a sales context as well as its original to examine boundaryless career orientation as a moderator between perceived job insecurity and work-related well-being.

2. Literature review

Well-being is viewed as the first and foremost goal in every society. Human well-being remained the goal of all human activities (Diener *et al.*, 1999). The literature review synthesizes that interest in employee well-being at work is growing globally (Kowalski and Loretto, 2017). Following the stream of positive psychology (Seligman and Csikszentmihalyi, 2000), there is a surge in organization behavior–related scholarship (Luthans, 2002; Cameron *et al.*, 2003; Cameron and Spreitzer, 2012; Simmons and Nelson, 2007) focusing on positive attitude and experiences at work. Since this development our understanding related to happiness and well-being at workplace has enhanced. Ample of constructs, including job satisfaction, job involvement, organizational commitment, work engagement, emotions and moods, intrinsic motivation, thriving and vigor have been measuring different forms and aspects of well-being (Fisher, 2010). The well-being of employees is a broad construct as it includes the physical, emotional, mental and spiritual health of employees (Mirabito and Berry, 2015). It describes the level of their work involvement, intrinsic motivation, engagement and meaning in work (Fisher, 2014). While well-being at work is multi-dimensional (Grant *et al.*, 2007; Page and Vella-Brodrick, 2009; Warr, 2013), its measurement and conceptualization vary in timeframe and range (Warr, 2013). For instance, Bakker and Oerlemans (2011) have proposed five frequently used indicators; engagement, job satisfaction, workaholism, burnout and happiness to measure affect based hedonic well-being at work. They ranked engagement in high pleasantness, while burnout in the low pleasantness low arousal quadrant. Finally, happiness as an emotion is considered to be high pleasantness and moderate arousal. Consequently, Fisher concluded that the scholars have defined construct in "many and inconsistent ways." He also noted that definition of well-being whether broad and or specific depends on the research questions being asked. He suggested that if the other constructs in the research model are specific and narrow, then specific and narrow measures of aspects of well-being might be most appropriate. If the other constructs in the model are broad, then general measures of well-being may be most suitable. Hence, he recommended the construct of job engagement to measure the intrinsic engagement and enjoyment aspect of the work-related well-being. He further acknowledged that the inclusive scale on work-related well-being measuring the entirety of the concept does not exist as the existing scale omits either subjective well-being aspects or social well-being items.

The current study focuses on "work-related" well-being. In the academic tradition, the construct of work-related well-being is measured by the concept of burnout, work engagement, occupational stress level and job satisfaction level. These measures estimate the vigor-fatigue, enthusiasm-depression and anxiety-comfort dimension of well-being

(Warr, 2002). In the similar vein, Maslach *et al.* (2012) conceive that employees' psychological relationship to their work is like a continuum between the negative experience of burnout and the positive experience of engagement. Besides, in the context of well-being the term engagement has become very popular though many scholars have defined it differently (Macey and Schneider, 2008). Some have conceptualized it in eudaimonic well-being domain focusing more on meaning and intrinsic motivation, and flow experiences while the other for instance Kahn (1990, 1992) coined the term "personal engagement" to denote to the physical, emotional and cognitive devotion to work. In the literature, the construct of well-being is defined in line with the hedonic perspective of happiness (Ryan and Deci, 2001), which connotes to the presence of positive mood and absence of negative mood (Diener *et al.*, 1998). Work engagement is the positive, fulfilling and affective motivational state of work-related well-being (Warr and Inceoglu, 2012) which is characterized by the concept of vigor, dedication and absorption (Bakker and Demerouti, 2008). Vigor denotes the extraordinary level of drive and mental resilience where one is ready to invest energy in execution of tasks while facing obstacles. Dedication refers to involvement in work such that it gives you sense of worth, pride and challenge, while absorption symbolizes full focus and of being joyfully immersed in activities (Bakker *et al.*, 2008; Schaufeli *et al.*, 2004; Narainsamy, 2013). In conformity with the previous related studies "work engagement" is employed as the indicator of work-related well-being (De Cuyper *et al.*, 2008; Vander Elst *et al.*, 2012). Work engagement is a significant indicator of occupational well-being for both employees and organizations (Bakker *et al.*, 2011). Just as Buitendach *et al.* (2016) used work engagement, happiness and job satisfaction as positive aspects whereas burnout as the negative aspect of employee well-being. In a recent study Vander Elst *et al.* (2012) on a heterogeneous sample of 3,185 Flemish employees measured the work-related well-being through vigor construct of engagement using Utrecht Work Engagement Scale (UWES; Schaufeli and Bakker, 2004). Work-specific well-being of Finnish dentists were determined by the burnout and work engagement constructs (Hakanen and Schaufeli, 2012). Besides, Kanste (2011) considers work engagement and work commitment as essential, positive components of work-related well-being. As Hakanen and Schaufeli (2012) argued, work engagement has temporal precedence over well-being. Dissimilar to the symptoms of burnout those who are engaged employees have a sense of robust and effective connection with their work (Schaufeli *et al.*, 2006), this engagement is characterized by the properties of "vigor, dedication and absorption" (Schaufeli *et al.*, 2002). Schaufeli *et al.* (2008) through the sample of 587 telecom managers concluded that workaholism, burnout and engagement are three different kinds of employee well-being. Moreover, burnout akin to job demands (e.g. role stress) (Bakker *et al.*, 2003, 2004), while engagement is associated to personal resources (Bakker *et al.*, 2005; Hakanen *et al.*, 2006; Langelaan *et al.*, 2006; Mauno *et al.*, 2007; Xanthopoulou *et al.*, 2007).

According to the World Health Organization (WHO), well-being of workers comprised of conditions whereby an employee understands his/her potential and ability to handle the pressures in working productively and contributing toward the whole society. Previous research suggested that happy and engaged employees are more likely to be productive (Saks, 2006; Reio and Rocco, 2011; Warr and Nielsen, 2018). This study takes Conservation of Resources (COR) theory (Hobfall, 1989) as the theoretical base that explained the relationship between perceptions of insecurity and work-related well-being. According to the basic credence of the COR theory, all individuals seek to acquire, retain, foster and protect those resources they consider valuable and that the individuals are threatened by the actual or potential loss of those resources (Hobfoll, 1989). He views "resources" as personal (skills, self-esteem), conditions (e.g. being employed, autonomy, performance feedback), energies (time, money and knowledge) and objects of value.

This study is investigating organizational communication, employee involvement, perceived employability and emotional exhaustion as antecedents of job insecurity using the

theory of COR. Resources can be categorized as job related and person related (Del Libano *et al.*, 2012). Personal resources reflect a sense of strength and refer to the individuals' capability to control as well as influence their environment (Hobfoll *et al.*, 2003). Perceived employability is a useful resource for active adaptability to labor market changes (De Cuyper *et al.*, 2011). Froehlich *et al.* (2015) confirm how perceived employability influences the relationship between job insecurity and job satisfaction. The COR theory considers emotional intelligence as a resource and for many years the emotional exhaustion has affected resource investment strategies tied to performance at work (Demerouti *et al.*, 2014; Halbesleben and Bowler, 2007). In literature, positive organizational communication efforts are proposed as a resource that might serve as a buffer in times of job insecurity (Jiang and Probst, 2013). Following sections present the theoretical review of each antecedent and its proposed influence on job insecurity and well-being.

2.1 Job insecurity and well-being

Job insecurity is considered as the common stressor having unfavorable consequences for employees (Cheng *et al.*, 2005). Job insecurity is the disease of the 21st century (Sjöberg, 2018). Greenhalgh and Rosenblatt (1984, p. 438) defined it as "a sense of powerlessness' to maintain desired continuity in the threatened job situation". De Witte (2005) has defined job insecurity as a perceived risk of losing the current job. It reflects the current situation of a job not the overall career of a person. Later, Vander Elst *et al.* (2016) described job insecurity as a subjective experience to feel the risk of potential job loss. Perceived job insecurity contributes to reducing job satisfaction, job involvement and trust in an organization (Richter and Naswall, 2019); soars organizational stress, anxiety and depression (Chirumbolo and Areni, 2010); ascends absenteeism (Jiang and Lavaysse, 2018; Karatepe *et al.*, 2020) and increases turnover (Hellgren *et al.*, 1999).

The COR theory (Hobfoll, 2002) explains the negative outcomes that job insecurity generates. From the COR theory's (Hobfoll, 2001) perspective, job security is also a resource as it guarantees access to other resources like salary to fulfill economic needs (Sjöberg, 2018). According to the COR theory, when the valued resources go under threat of loss it creates anxiety and stress. People get stressed when they fail to invest resources that are essential for their goals (Hobfoll, 1989). Taking note of the COR theory, we can conclude that the possible or actual job loss presents a threat to the valuable resource or resources that would, in turn, lead toward impaired well-being. The potential job loss would generate stress reactions, i.e. less engagement in work that eventually goes toward the loss spiral. Consistent with the COR theory, we can say that the possible or actual job loss of employees be it job features presents a threat to the valuable resource or resources. Employees simultaneously start searching for other jobs during work time instead of concentrating on their present job (König *et al.*, 2010). Likewise, when employees experience the threat of resource (job) loss, they invest less energy in their current job to prevent further resource losses (Cheng *et al.*, 2012).

Findings of various studies proposed that job insecurity has a negative link with job attitude, as well as the well-being of employees (Cheng *et al.*, 2005; Otto *et al.*, 2011, 2016; Jiang and Probst, 2016; Huang *et al.*, 2017; Getahun Asfaw and Chang, 2019). People having more resources may perceive the less risk job loss, however, those with fewer resources may perceive their jobs insecure and become less engaged (Holmgreen *et al.*, 2017). Studies confirmed that job insecurity is related to a separate dimension of work engagement and job insecurity predicted low dedication (Mauno *et al.*, 2007; Xanthopoulou *et al.*, 2007; Vander Elst *et al.*, 2010). That is, engaged employees are working enthusiastically (vigor), are concerned about their work (dedication) and are fully focused and happily immersed in their work (absorption) (Bakker *et al.*, 2008). Thus, the study tested the following hypothesis for the salespersons:

H1. Perceived job insecurity has a negative relationship with work-related well-being.

2.2 Employee involvement

Employee involvement creates a setting that connects employees in all levels of organizational decision-making, giving them information, and involving them in problem-solving activities (Riordan *et al.*, 2005). Therefore, employee involvement policies are globally practiced (Su and Wright, 2012; Smith *et al.*, 2018). Employee involvement can be an important resource at work to achieve success (Hobfoll, 1988, 1989). The basic assumption of the COR theory is that individuals in all contexts strive to retain, protect and gain resources for maintaining well-being (Hobfoll, 2001). When employees possess resources, they develop the ability to protect the future loss of resources (Hobfoll *et al.*, 2018). Previous literature provides the evidence that employee involvement is positively related with work engagement (Macky and Boxall, 2008; Rana, 2015). Similarly, more engaged employees are less likely to feel insecure about their job.

In the same way, involved employees are less likely to feel insecure about a job. Similarly, Huang *et al.* (2012) revealed that employee involvement practices that include decision-making, information sharing would increase perceptions of control in employees; hence, minimizing the perceived job insecurity. This is because the participation of employees provides opportunities for networking with supervisors that may increase the perception of security (Vander Elst *et al.*, 2010). The COR theory suggests that a person when gaining more resources will move to well-being (Hobfoll, 2002). It can be hypothesized that:

H2a. Employee involvement is positively related with work-related well-being

H2b. The relation between employee involvement and work-related well-being is mediated by perception of job insecurity.

2.3 Organizational communication

Organizational communication is the extent to which workers have an adequate amount of information about the organization and their tasks (Stoter, 1997). Organizational communication reinforces the worker's understanding and control over their work situation and conditions (DeWitte, 2005), as it offers clarity and certainty in one's employment setting and is related with higher well-being (Vander Elst *et al.*, 2010). Previous studies reported a positive relationship of organizational communication and work engagement (May *et al.*, 2004; Lieke *et al.*, 2012). Adkins *et al.* (2001) suggested the negative association of organizational communication with perceived job insecurity. That is, when employees have information about their roles such as expectations, performance ratings and conditions of employment, it helps workers to feel secure (Huang *et al.*, 2012). However, poor organizational communication creates unclear expectations and enhances employee's perceptions of job insecurity (Keim *et al.*, 2014). Likewise, rumors also create confusion, enhancing the perception of job insecurity among employees (Smet *et al.*, 2016). The COR theory (Hobfoll, 2001) conceptualizes organizational communication as a key resource for employees to gain insights about work situations. Well-being is influenced by the extent to which the resources are pooled by employees in understanding and controlling the job insecure situations. It can be hypothesized that:

H3a. Organizational communication is positively related to work-related well-being.

H3b. The relationship between organizational communication and work-related well-being is mediated by perceived job insecurity

2.4 Perceived employability

Perceived employability is defined as the perceptions of an individual's ability to find alternate employment (McQuaid and Lindsay, 2005). It is been evaluated by objective

indicators such as education, skills, training and occupational or market position (Van Dam, 2004; De Jong and Schalk, 2017). Several studies described perceived employability as a "potential antecedent of job insecurity" (Forrier and Sels, 2003; Berntson *et al.*, 2007). Previous studies also confirmed a negative association between perceptions of job insecurity and employability (Kalyal *et al.*, 2010). This study conceptualized the perceived employability as the personal resource from the COR perspective. According to the COR theory, individuals with resources can gain more means as well as have less risk of resource loss. The characteristics which are tied to an individual as resources include feelings about being able to influence its environment and situation (Hobfoll *et al.*, 2003). Researchers have found a positive relation of perceived employability with employees' general and work-related well-being (Silla *et al.*, 2009; De Cuyper *et al.*, 2008). It can be hypothesized that:

H4a. Perceived employability is positively related to work-related well-being.

H4b. The relation between perceived employability and work-related well-being is mediated by perceived job insecurity

2.5 Emotional exhaustion

It is observed that exhausted workers express very little energy, and they also have reduced resources, hence reduced personal accomplishment. Emotional exhaustion is mostly demonstrated by physical fatigue and the feeling of psychologically and emotionally drained sensations (Wright and Cropanzano, 1998). Emotional exhaustion arises when workers feel that they do not have sufficient physical and emotional resources in coping with different stressors (Hobfoll, 1989). Emotional exhaustion is found to initiate perceived job insecurity because the exhausted workers exhibit poor performance. So, emotional exhaustion with poor performance spurs feelings of job insecurity. Work engagement is essentially regarded as energy and thereby a resource, consistent with the COR theory. The COR theory conceptualizes emotional exhaustion as the depletion of energy resources (Halbesleben, 2010; Zijlstra *et al.*, 2014) that ultimately reduces the work engagement. Most of the research has reported a negative relationship between work engagement and emotional exhaustion (Schaufeli and Bakker, 2004; Hakanen *et al.*, 2018). In a study of 1,314 employees of Finnish universities, De Cuyper *et al.* (2012) found the positive relation of emotional exhaustion and perceived job insecurity which ultimately affects the work-related well-being. Therefore, it can be hypothesized that:

H5a. Emotional exhaustion is negatively related to work-related well-being.

H5b. The relation between emotional exhaustion and work-related well-being is mediated by perceived job insecurity.

2.6 Moderating role of boundaryless career orientation

The boundaryless career orientation is defined as the career paths wherein employees respond to reduced organizational resources by seeking opportunities and resources from outside the current employer, by changing employers or building an external professional network (Arthur and Rousseau, 1996). It encourages flexibility, the development of knowledge and networks, and the taking of responsibility for one's career (Cartwright and Cooper, 2008). Sullivan and Arthur (2006) proposed a boundaryless career orientation as physical or psychological mobility. Physical mobility refers to the actual movement across organizations and industries, whereas psychological mobility is the psychological orientation toward making those movements. This study adopted Briscoe and Hall's (2006) idea of boundaryless career orientation as the preference of employees to move across different employers/organizations. Boundaryless career orientation provides the shift in control of

careers from organizations to individuals. By using the COR theory (Hobfoll, 2001), the study conceptualizes boundaryless career orientation as a personal resource; therefore, the employees who possess resources, develop the ability to protect their resources (Hobfoll *et al.*, 2018). Personal resources in work environment refer to an individual's sense of capability to manage his or her surroundings. When an individual takes account of one's career, they perceive their work as significant, meaningful and valuable (Rosso *et al.*, 2010). Employees who have personal resources have confidence in their capabilities and are optimistic about their future. This allows them to be more engaged in their jobs (Xanthopoulou *et al.*, 2007; Ngo and Hui, 2018). Individuals while gaining resources and opportunities for developing new skills and competencies may better adapt to the current work environment and move toward well-being (Hobfoll, 2002). From the COR theory and the above discussion, it can be hypothesized that:

H6. Boundaryless career orientation will be positively related to the work-related well-being.

Several studies suggest that individuals with high boundaryless career orientation are characterized by high mobility. Conversely, persons with low boundaryless career orientation choose to do an existing job with the same employer (Volmer and Spurk, 2011). Boundaryless career orientation allows individuals to continue to thrive even in uncertain conditions and explore alternative opportunities, while maintaining capabilities in their existing employment at the same time (Briscoe *et al.*, 2012). The COR theory states that resource investment is more evident during the time of possible loss (Hobfoll, 2001). It is therefore assumed that the salespersons with a high presence of boundaryless career advance their resources to develop more resources. Moreover, boundaryless career orientation provides the basis of career success by understanding one's competencies, opportunities in the wider economic environment and likely development in future jobs. From the COR theory and the above discussion, it can be hypothesized that:

H7. Boundaryless career orientation buffers the negative association between perceived job insecurity and work-related well-being (Figure 1).

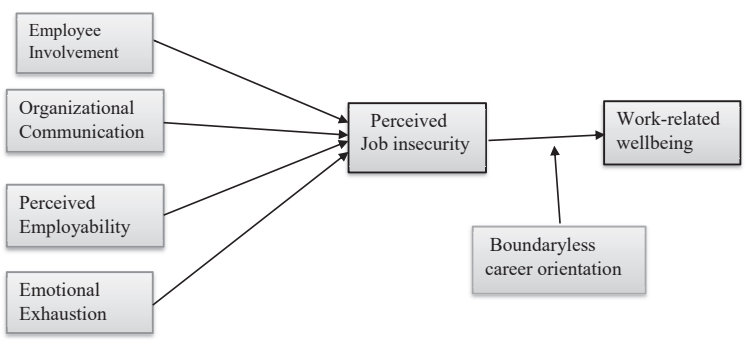

Figure 1.
Proposed research framework

3. Research methodology

The present study employed a quantitative design and deductive approach as the objective is to examine the factors to reduce the perceptions of job insecurity among salespeople. The study takes the COR theory by Hobfoll (1989, 1998) as the deductive argument that sets the foundation for establishing the hypotheses of the research.

3.1 Data collection

Cross-sectional data were collected from salespersons of pharmaceutical companies in Pakistan where job insecurity is a reality (Chaker *et al.*, 2016). Furthermore, the literature review synthesized scarcity of well-being related empirical studies on this sector. The self-reported questionnaire was personally distributed to 350 salespersons using simple convenience sampling. This method of sampling is recommended when the sample meets the objectives of research and is willing to participate in the study, sample is easily accessible, is at proximity and accessible on time (Dörnye, 2007). Convenience sampling technique is appropriate to both qualitative and quantitative design of studies as this method underscores generalizability of the findings on the population (Etikan *et al.*, 2016; Suen and Lee, 2014). In total, 306 filled questionnaires were obtained, yielding the rate of response 87% approximately. The standard statistical analysis including structural equation modeling "recommends a sample of 200 as fair and 300 as good" sample for such studies (Tabachnick and Fidell, 1996). The current study followed the suggestion of Hair *et al.* (2008) to choose a sample that is five times the number of items in the questionnaire. Therefore, a sample size of 310 was required for this study. The demographic characteristics of the sample are shown in Table 1.

3.2 Measures

The questionnaire comprised of 62 items, 12 items measured employee involvement using the scale of Vandenberg *et al.* (1999), employee's perceptions of involvement on four components such as sharing of power, information, reward and knowledge was assessed. For example, items included "I have sufficient authority to fulfill my job tasks," "Company policies and procedures are communicated to employees," "Generally, I feel this company rewards employees who make an extra effort," "I am given a real opportunity to improve my skills at this company through education and training programs." Similarly, 11 items of the scale proposed by Smidts *et al.*'s (2001) assessed organizational communication (e.g. "I have received information about the goals of our organization"; "I have received information about how well I fulfill my task"; "I have received information about ongoing management decisions"). A six-item scale for emotional exhaustion by Maslach *et al.* (1996) was used. Burnout inventory measures how often an individual feels emotionally exhausted by his job. The items were rated on a seven-point Likert scale ranges from 0-never to 6-everyday. Sample items include "I feel emotionally drained from my work," "I feel tired when I get up in the morning and face another day of work," and "I feel I'm working too hard on my job." perceived employability was measured with four items from De Witte (1992). It has items as: "I am confident that I could quickly get another job," rated on a 5-point Likert-type scale ranges from 1-(totally disagree) to 5-(totally agree), and 7-items of perceived job insecurity was lent

Variables	Characteristics	Frequency	Percentage (%)
Gender	Male	288	94
	Female	18	6
Age	21–30	220	71.8
	31–40	70	22.8
	41–50	13	4.2
	51–60	3	1.0
Education	Graduation	226	73.9
	Masters	80	26.1
Experience	1–10 years	281	91.8
	11–20 years	21	6.8
	21–30 years	4	1.3

Table 1. Demographic information of sample

from Hellgren *et al.* (1999) such as: "I am worried that I will have to leave my job before I would like to," "I worry about being able to keep my job." 17-item scale of work-related well-being was lent through the Utrecht Work Engagement Scale (Schaufeli *et al.*, 2002). It measured vigor (6 items), dedication (5 items) and absorption (6 items) and were rated on a 7-point Likert-type scale ranges from 0-never to 6-everyday. Boundaryless career orientation is measured through Briscoe *et al.*'s (2006) subscale of organizational mobility. It was rated on a 5-point Likert-type scale ranging from 1 (to a little or no extent) to 5 (To a great extent). The items of organizational mobility were reversely coded. The sample items include "I would feel very lost if I could not work for my current organization," "I prefer to stay in a company I am familiar with rather than look for employment elsewhere," "In my ideal career, I would work for only one organization." Demographic information such as gender, education level and years in service was treated as control variables.

4. Analysis and results

The preliminary analysis of data was conducted with Statistical Package for Social Sciences (SPSSs), version 20.0. The analysis includes the screening of data, descriptive statistics and normality. The descriptive analysis including means and standard deviation (SD) of the sample is shown in Table 2. The table also includes the skewness and kurtosis values of variables demonstrating that the normality of data is ensured. Structural equation modeling was employed with SmartPLS 3.0. to test the measurement and structural model. The following is the detailed evaluation of both measurement and structure model.

4.1 Assessment of measurement model

The assessment of the outer model determines the fit among the proposed theory and data collected (Hair *et al.*, 2014). The confirmatory factor analysis was used to evaluate the measurement model. The outer loadings of every item used in this study are generated in partial least squares (PLS) calculation. Table 4 shows that each item has a loading of above 0.50, the items below 0.40 loading were deleted for further analysis (Hair *et al.*, 2014). It ensures that only valid and reliable constructs should be used to measure the relationships among variables. The reliability of instruments is evaluated with Cronbach's alpha. The Cronbach's alpha evaluates the internal consistency of the instrument, and Sekaran (2006) recommends the value of 0.5 as poor, 0.6 is satisfactory and 0.7 as good. For this study, Cronbach's alpha of all constructs is greater than a satisfactory level (See Table 3). The composite reliability indicates the internal consistency and its value should be 0.6 (Bagozzi and Yi, 1988; Awang, 2015). Composite reliability values displayed a satisfactory level (See Table 3). Construct validity is defined as the degree to which measured items characterize the underlying construct (Saunders *et al.*, 2016, p. 193). The validity of the construct is measured by convergent and discriminant validity. For establishing convergent validity, the factor loadings (See Table 4) and "average variance extracted" (AVE) are higher than 0.5 as recommended by Hair *et al.* (2014). Table 3 exhibits AVE values thus establishing the convergent validity of all variables. Discriminant validity evaluates that every construct to be distinct and unique from all other constructs and the correlation matrix in Table 1 exhibit the square root of the AVE for every variable is higher than their correlation with other variables as recommended by Fornell and Larcker (1981).

4.1.1 Control variable:. Control variables like gender education level and years in service were assessed to eliminate alternative explanations for the obtained results in SPSS. As such coding for gender is 1 = male; 2 = female. For education level (1 = masters; 2 = graduation; 3 = other) and years in service is coded as (1 = 1–10 years; 2 = 10–20 years; 3 = 20–30 years). An independent sample *t*-test was conducted to compare the mean difference between males

Variables	Mean	St. deviation	Skewness	Kurtosis	BCO	EE	EI	OC	PE	WWB	JIS
Boundaryless career orientation	2.39	0.719	0.014	−0.777	*0.725*						
Emotional exhaustion	2.92	1.112	−0.584	−0.285	−0.317	*0.728*					
Employee involvement	3.05	0.6938	−0.219	−1.147	−0.054	−0.062	*0.674*				
Organizational communication	3.12	0.638	−0.406	−0.431	−0.249	0.136	0.491	*0.652*			
Perceived employability	2.89	0.702	−0.665	0.259	−0.280	0.243	0.323	0.409	*0.733*		
Work-related well-being	3.69	0.732	−0.839	0.650	−0.137	0.410	−0.001	0.224	0.272	*0.660*	
Perceived job insecurity	2.65	0.732	−0.082	−0.263	−0.319	0.574	0.215	0.306	0.491	0.309	*0.720*

Note(s): Square root of AVE values diagonally in bold established discriminant validity

Table 2.
Descriptive statistics and correlations of studied variables

and females. The reported result was insignificant; hence, there is no statistical significance difference between gender male and female with respect to work-related well-being. To check the significant mean differences among different education levels and years in service with respect to the dependent variable, we run the one-way Analysis of Variance (ANOVA) test in SPSS, but we did not find the significant result of the test, justifying that there is no mean statistical difference in education and years in service concerning work-related well-being.

4.1.2 Common method variance:. Data were collected through a self-reported questionnaire. Thus, to avoid common method variance, several measures were adopted. First, the study adopted procedural recommendations by Podsakoff *et al.* (2003) such as using different scale types for the independent and outcome variable; adopted the validated measures and used reverse-coded items on a scale. Next, Harman's one-factor test was conducted to examine common method variance. This has ensured that all measurement items were subjected to factor analysis by applying the extraction method of the principal component of one fixed factor with no rotation method (Podsakoff, 2003). Common method variance exists when a single factor accounts for more than 50% variance independent variable. The first factor explained 34.14% of the variance, demonstrating that there is no single factor accounting the variance in this study.

4.2 Assessment of structure model

The partial least squares structural equation modeling (PLS-SEM) technique was employed for hypotheses testing. The bootstrapping analysis estimated the β-coefficients that reflect the strength of relations among dependent and independent variables. The hypothesis is accepted if $t \geq 1.96$ at the 0.05 level of significance (Peng and Lai, 2012; Hair *et al.*, 2014). Table 5 demonstrates the results of path estimates. All paths are significant except for the direct relationship of perceived employability and work-related well-being (β 0.047, p 0.432) (See Table 5). Our first hypothesis (H1) examined the negative relationship of perceived job insecurity with work-related well-being. The results demonstrated negative significant paths from work-related well-being and perceived job insecurity (β −0.335, p 0.00); hence, H1 is accepted (See Table 5). First, we tested the direct relationships of work-related well-being with employee involvement (H2a), organizational communication (H3a), perceived employability (H4a) and emotional exhaustion (H5a). Except perceived employability (H4a) all direct hypothesis are accepted (See Table 5).

4.2.1 Mediation analysis. Mediation refers to the existence of a third variable or mechanism which influences the effect of the independent variable on the consequence or outcome variable (Aguinis *et al.*, 2017). The researcher used bootstrap analysis (Preacher and Hayes, 2008) to test the mediation. Bootstrapping is a robust method to conduct mediation analysis (Hayes, 2013). In this method, sampling distribution is computed by intensive repeated iterations. First, the path model was assessed using the bootstrapping technique, without the mediator (See Table 6). We tested the mediating role of perceived job insecurity

Table 3.
Cronbach's alpha, composite reliability and average variance extracted of all variables

Variables	Cronbach's alpha	Composite reliability	AVE
Employee involvement	0.739	0.802	0.504
Organizational communication	0.668	0.786	0.501
Perceived employability	0.711	0.821	0.537
Emotional exhaustion	0.780	0.849	0.530
Perceived job insecurity	0.767	0.843	0.519
Work-related well-being	0.745	0.821	0.436
Boundaryless career orientation	0.708	0.815	0.526

Items	EI	OC	PE	EE	JIs	BCO	WWB
EI1	0.630						
EI2	0.767						
EI3	0.570						
EI5	0.554						
EI6	0.830						
EI11	0.527						
EI12	0.743						
OC1		0.713					
OC11		0.802					
OC2		0.782					
OC5		0.827					
OC6		0.700					
OC9		0.686					
PE1			0.804				
PE2			0.840				
PE3			0.767				
PE4			0.835				
EE1				0.630			
EE2				0.767			
EE3				0.570			
EE5				0.554			
EE6				0.830			
JIs1					0.747		
JIs2					0.859		
JIs3					0.724		
JIs5					0.870		
JIs6					0.629		
JIs7					0.630		
BCO1Rev						0.656	
BCO2Rev						0.815	
BCO3Rev						0.686	
BCO4Rev						0.842	
BCO5Rev						0.860	
WWB1							0.736
WWB2							0.782
WWB3							0.781
WWB4							0.677
WWB5							0.547
WWB6							0.704
WWB10							0.577
WWB16							0.610
WWB17							0.809

Table 4.
Outer loadings of items used in this study

between work-related well-being and employee involvement (H2) organizational communication (H3), perceived employability (H4) and emotional exhaustion (H5). From that sampling distribution, the effects of the direct and indirect paths are evaluated (Awang, 2015) with SmartPLS. Table 6 demonstrates the significant results of the mediation analysis.

To check the strength of mediation, Hair *et al.* (2014) suggest mediation strength VAF (variance accounted for) score which was calculated in MS Excel. According to Hair *et al.* (2014) if the value of VAF is above 80% it is called full mediation. If the value of VAF lies in-between 20 to 80%, it is called partial-mediation and VAF below 20% accounted as no mediation. Table 6 also demonstrates the calculated VAF score. The indirect path (EI → JIS → WB) has a *t*-value of 3.17412; hence, H2 is accepted. The VAF value of

Effects	Path	β	t-values	p-values
Without mediator	Employee involvement → Work-related well-being	0.365	3.493	0.00
	Organizational communication → Work-related well-being	0.381	4.409	0.000
	Perceived employability → Work-related Well-being	0.047	0.786	0.432
	Emotional exhaustion → Work-related well-being	−0.300	8.391	0.000
	Boundaryless career orientation → Work-related well-being	0.260	3.551	0.000
	Moderating effect → Work-related well-being	0.230	3.676	0.000
With mediator	Employee involvement → Work-related well-being	0.279	2.956	0.003
	Organizational communication → Work-related well-being	0.354	4.823	0.000
	Perceived employability → Work-related well-being	0.071	0.797	0.428
	Emotional exhaustion → Work-related well-being	−0.301	8.391	0.000
	Job insecurity → Work-related well-being	−0.335	4.943	0.000
	Employee involvement → Job insecurity	−0.379	4.384	0.000
	Organizational communication → Job insecurity	−0.304	3.151	0.003
	Perceived employability → Job insecurity	−0.254	2.312	0.021
	Emotional exhaustion → Job insecurity	0.462	7.912	0.000

Table 5.
Path estimates of model

Path	Mediator	Direct effects	Indirect effect	Total effects	VAF	t-value	Mediation
EI-WWB	N/A	0.365	N/A	N/A	N/A	3.493	N/A
OC-WWB	N/A	0.381	N/A	N/A	N/A	4.409	N/A
PE-WWB	N/A	0.047	N/A	N/A	N/A	0.786	N/A
EE-WWB	N/A	−0.300	N/A	N/A	N/A	8.391	N/A
EI-WWB	JIs	0.279	0.126	0.395	32.06%	3.174	Partial
OC-WWB	JIs	0.354	0.101	0.456	22.29%	2.483	Partial
PE-WWB	JIs	0.071	0.034	0.415	8.38%	0.945	No mediation
EE-WWB	JIs	−0.301	−0.154	−0.455	33.96%	−4.299	Partial

Table 6.
Results of mediation analysis

Note(s): $p < 0.05$. VAF >80% = Full mediation, 20% ≤ VAF 80% = Partial mediation, and VAF <20% = No mediation; VAF, variance accounted for; N/A, not applicable

indirect path is 32% accounted for as partial mediation. H3 is confirmed as the indirect path (OC → JIS → WB) has t-value, 2.4839, and the VAF score of this path is 22% accounted as partial mediation. The indirect path (EE → JIS → WB) with t-value, −4.2991 also confirms the H5. The VAF accounted for this path is 33.96% all the above scores are between 20 and 80% it is established that perceived job insecurity partially mediates these relationships (See Table 6). However, the study revealed an indirect path (PE → JIS → WB) as insignificant with t-value 1.088; hence, H4 is rejected (See Table 6).

4.2.2 Moderating role of boundaryless career orientation. It was assumed that a positive relation between boundaryless career orientation and work-related well-being exists. The results demonstrated positive significant paths from work-related well-being and boundaryless career orientation (β 0.260, p 0.00). Thus, hypothesis H6 and H7 both are supported. The results confirmed the hypothesis 15 (β 0.230, p 0.00) which proposed that the relationship of perceived job insecurity and work-related well-being will be weaker when boundaryless career orientation will be high as compared to low. High boundaryless career orientation among salespersons has buffered the negative association between perceived job insecurity and work-related well-being. Figure 2 indicates the direction of the boundaryless career orientation and perceived job insecurity interaction with relationship to work-related well-being. It exhibits that the slope in the graph is steeper in case of low boundaryless career orientation. Moreover, individuals with low boundaryless career preferences appeared not to

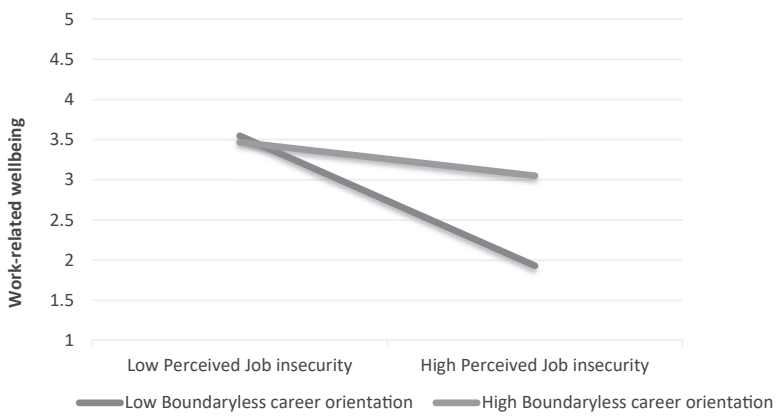

Figure 2.
Moderating effect of boundaryless career orientation

alleviate the negative relationship between perceived job insecurity and work-related well-being.

5. Discussion

Though many studies have brought the importance of organizational communication, employee involvement (De Witte, 2005; Vander Elst *et al.*, 2010; Shoss, 2017), perceived employability (Bernstrøm *et al.*, 2019) and other personal resources to prevent the perceived job insecurity, yet very few studies have investigated these relationships to reduce perceptions of job insecurity among employees (Huang *et al.*, 2012). The current study aspires to investigate the factors that contribute to prevent the perceived job insecurity and mitigate its negative impacts on the work-related well-being of salespersons.

Our first objective was to examine how organizational communication, employee involvement at the organization level and individual factors (perceived employability and emotional exhaustion) contribute toward well-being by reducing the perceptions of job insecurity among pharmaceutical salespeople in Pakistan. The empirical results confirmed the role of the salespersons' involvement and effective communication to reduce the perceptions of job insecurity (see Table 5). Our finding is consistent with the previous study of Vander Elest *et al.* (2010) who by engaging a sample of service and industrial workers in Belgium found that communication reduces the worker's perception of job insecurity. Keim *et al.* (2014) also found that greater communication makes the work environment less ambiguous, provide clarity in role and job duties, reduce conflicts, and thus, minimize the perceptions of job insecurity. Similarly, a longitudinal study of Huang *et al.* (2012) also found that organizational practices of employee involvement and communication reduce job insecurity by creating clarity and certainty in the work situation. Recent studies on the topic verified that organization which involve employees in strategic decisions can make them feel more secured, safe and attached with the organization (Pham *et al.*, 2020; Vinodkumar and Bhasi, 2010).This is also in alignment with the arguments of the COR theory that individuals having more resources perceive the less risk of job loss; however, those with fewer resources may perceive their jobs insecure (Holmgreen *et al.*, 2017). Thus, effective communication and employee involvement in terms of shared knowledge, involvement in decisions and reward compensation provide the opportunity to reduce the perceptions of job insecurity among salespersons.

Our finding validates a significant positive relationship between emotional exhaustion and job insecurity (see Table 5). Support for this relationship comes from Piccoli and De Witte

(2015) who proposed that exhausted workers are less likely to show desired performance, hence, experience more job insecurity. Finally, we also confirmed perceived employability as a personal resource prevents the feelings of job insecurity. This result simulated the findings of De Cuype *et al.* (2012) who also found the negative association of perceived employability to job insecurity among Finnish workers. Peiró *et al.* (2012) using the data of 3,000 Spanish employees also found that employability reduces job insecurity. Our finding proved the argument of the COR theory (Hobfoll, 1989, 2001) that employees who perceive themselves as employable are less vulnerable to resource loss in the form of job insecurity. Specifically, the salespeople having more personal resources perceive themselves as less insecure (Aybas *et al.*, 2015)

Next, the results of the mediation analysis confirmed job insecurity as a mediator as most (3 out of 4) mediation paths were significant (see Table 6). One of the significant effects is related to the partial mediation of job insecurity between employee involvement and their work-related well-being. As such when employees are involved in their work policies and procedures, they consider their job less insecure and engage more toward their work. Further, the relationship between organizational communication and well-being is mediated by job insecurity, so that effective communication prevents job insecurity, which, in turn, associates with well-being. Job insecurity also mediates the relationship between emotional exhaustion and well-being as emotionally exhausted salespersons perceive more insecurity that impairs their engagement toward work. The non-significant effect is related to the mediating role of job insecurity on perceived employability and work-related well-being. Thus, highly employable salespersons feel less job insecurity and are motivated to engage in their work. On the other hand, Bernstrøm *et al.* (2019) found that highly employable workers leave insecure jobs. Our finding is inconsistent with the previous study that salespersons having a will and the means to fulfill the requirements of work and achieve their goals move toward higher well-being (Bouzari and Karatepe, 2018).

Another objective was to mitigate the effects of perceived job insecurity by using boundaryless career orientation among salespersons. The study confirmed the moderating role of boundaryless career orientation on the association between perceived job insecurity and well-being that salespeople having high boundaryless career orientation are less likely to feel insecure about their job. Our finding is following the COR theory that resourceful employees possess relevant skills and expertise and become less vulnerable to job loss. Similarly, the relevant resources of work enable flexibility and reduce the negative effects of perceived job insecurity by lowering expectations for security (Klehe *et al.*, 2012). Salespersons with more resources, possessing the relevant skills and expertise in their field are less vulnerable to job loss, and this resource gain (being able to get employed) will buffer the negative reactions of perceived job insecurity. Moreover, salespersons with a high presence of boundaryless career advance their resources to develop more resources such as knowledge, experience and professional networks across organizations.

6. Conclusion and implications

Thus far, there is little empirical research directed on the effects of job insecurity on work-related well-being using the lenses of the COR theory (Lee *et al.*, 2018).

Further, the study introduced and examined the buffering role of boundaryless career orientation by using the COR theory. Boundaryless career orientation is conceptualized as a personal resource moderating the association between perceived job insecurity and employee well-being and its outcomes. Furthermore, the study tested the extent to which boundaryless career orientation (BCO) operates as a buffer that weakens negative effects. The results revealed that employees having high BCO are less likely to feel insecure about their job.

This study examined the ways to prevent and mitigate the negative effects of perceived job insecurity on the work-related well-being of pharmaceutical salespersons. To make employees engaged, the organizations are required to involve employees by sharing knowledge, information, and power to make decisions, value their opinion and ensuring employability. Such salespersons, in turn, contribute to the organization by offering solutions to customer problems and making suggestions for increasing their sales performance. BCO proved to moderate the relationship between job insecurity and work-related well-being. Salespersons having a preference of a boundaryless career are motivated to advance their resources and develop more resources such as knowledge, experience and professional networks across organizations. This conclusion fills in the gap of current literature on moderating variables in the association of perceived job insecurity and well-being which was one of the objectives of this research.

This investigation makes meaningful theoretical implications in the existing literature of well-being. The study proposed that the utilization of organizational and personal resources will reduce the perceptions of job insecurity among salespersons using the lens of the COR theory which was less investigated. Further, using the COR theory, this study spearheaded future research by examining BCO mitigating the negative impact of job insecurity on the well-being of salespersons. The finding attached the importance of work environment and work practices (involvement and communication) to reduce perceptions of insecurity among pharmaceutical salespersons.

COVID-19 has recently transformed the demand and supply side of labor market. This mega crisis has influenced the wage rates and downsizing has become a panacea. Consequently, the employees feel threatened and their job quality is compromised (Frone, 2018; Meyer *et al.*, 2018). Niesen *et al.* (2018) acknowledged that downsizing increase employees' job insecurity. Economic indicators and company reports indicate "service mega-disruptions" due to COVID-19 for businesses, in particular for the services sector (Kabadayi *et al.*, 2020). In this background, our findings provide several useful implications for administrators, pharmaceutical salespersons and managers. It is noted that in uncertain conditions like COVID-19, the employees feel less engaged toward work and exhaust emotionally; therefore, the employers and managers should minimize the effects of perceived job insecurity to win the commitment of employees. A recent meta-analysis on organizational resilience during the turbulent times like pandemics concluded that communication and openness along with contact frequency with employee will have a positive influence on the overall well-being of employees (Bui *et al.*, 2019). This communication must contain the element of hope and continuity of services during the crisis. An organization may engage employees in their decisions which may reduce their concerns over potential job loss. It will enable organizations to create an engaged and loyal salesforce. Further by providing the feeling of employability to pharmaceutical salespersons, the insecurity perception may reduce, and it will send signals to employees that management is willing to invest in developing their skills and knowledge. Our support theory of COR maintains that effective response of organization during the uncertainty like pandemics reduces the psychological and physiological strain associated with a depletion of resources tempted by a pandemic (Vo-Thanh *et al.*, 2020). The moderating role of high BCO suggests the need for individual workers to develop new skills and opportunities as job insecurity is influenced by one's subjective perceptions. With this recognition, the corporate strategy must revolve around the continuous training for enhancing the motivation level as well as to improve the professional and emotional skills for career advancement in the organization. At the management level, this can be done through strong internal recruitment systems that enable the employees to upgrade their current position through internal mobility.

7. Limitations

There are some limitations related to this research. The first limitation of the study is the cross-sectional design thereby the researcher has collected data at one point in time. Some researchers argued that job insecurity persists overtime which may affect the future well-being. Therefore, future studies must consider longitudinal designs so that the underlying process is investigated further. Another limitation of this study is the selection of the sample, pharmaceutical salespersons. Future research may be commissioned to consider other sets of salespersons which will lead to the validity of results. Future research needs to uncover additional moderators like psychological contract fulfillment to mitigate the negative impact of perceived job insecurity on employee's well-being.

The third limitation is the use of a self-report questionnaire. Employees reporting their perceptions about predictor and criterion variables can be a reason for common method variance that in turn affects the findings. Therefore, the study adopted procedural recommendations by Podsakoff *et al.* (2003) such as using different scale types for the independent and outcome variable; used reverse-coded items in scale; adopted the validated measures; ensuring that there was no single factor accounting for the majority of the variance. Besides, to prevent the effect of social desirability in data, the respondents were asked to participate voluntarily, and anonymity was ensured by the researcher. Additional research on the outcomes of the job insecurity among salespeople may illuminate this field of research. For instance, career adaptability dimension could be studied as the moderator or different components of work-related well-being may be measured through burnout and job dissatisfaction dimensions. Another interesting study could be the investigation on our antecedents on different career stages as employees face different set of challenges related to their well-being. For in-depth and holistic understanding of how pandemics are shaping individuals' short-term and long-term career choices, this research could be extended by employing BCO and turnover intent as an antecedent.

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Managerial support, work–family conflict and employee outcomes: an Australian study

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Abstract

Purpose – Derived from leader–member exchange theory, this study hypothesises the relationships between work–family related managerial support and affective commitment and job satisfaction, and advocates that these relationships are mediated by work–family conflict.

Design/methodology/approach – The model was tested in an Australian manufacturing organisation using survey data from employees, using structural equation modelling in Analysis of Moment Structures (AMOS).

Findings – The findings suggest that enhanced work–family related managerial support will decrease work–family conflict, eventually enhancing employees' affective commitment and job satisfaction.

Originality/value – This study provides important insights into the impact of managerial support on improvements in employees' work–family conflict, and, in turn, its impact on affective commitment and job satisfaction, in the Australian context.

Keywords Managerial support, Work–family conflict, Affective commitment, Job satisfaction

Paper type Research paper

Introduction

The conflict between work and family has been an important research field due to substantial changes in workforce demographics, such as dual-earner couples and increasing women's workforce participation (Allen *et al.*, 2000; Greenhaus *et al.*, 2012; Odriozola and Baraibar-Diez, 2018). "Work–family conflict" (WFC), termed by Greenhaus and Beutell (1985, p. 77), refers to "a form of inter-role conflict in which the role pressures from the work and family domains are mutually incompatible in some respect". WFC is related to work–family interference, which refers to the situation in which participation in the family (work) domain is hindered by participation in the work (family) domain (Tummers and Babette, 2014). WFC can impose direct and indirect costs for an organisation. The former includes involvement and belonging (e.g. turnover, strike or slowdown) and industrial accidents, whereas the latter entails lower levels of job satisfaction and organisational commitment as well as deteriorating the employer–employee relationship (Quick, 2013).

WFC has been found to be negatively associated with employee outcomes in the work domain, including *job satisfaction* (e.g. Allen *et al.*, 2000; Frone *et al.*, 1992; Gözükara and Çolakoğlu, 2016; Kossek *et al.*, 2011), *affective commitment* (e.g. Cloninger and Selvarajan, 2015; Qureshi *et al.*, 2019), and well-being (e.g. Chambel *et al.*, 2017; Galletta *et al.*, 2019; Karatepe and Karadas, 2016; Kinman *et al.*, 2017; McDowell *et al.*, 2019). While job satisfaction refers to an individual's enjoyment or positive emotion arising from an evaluation of his or her job and/or job experiences (Locke, 1976), affective commitment is 'the relative strength of an

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individual's identification with and involvement in a particular organisation' (Mowday *et al.*, 1979, p. 226). *Managerial support* can elicit satisfaction and affective reactions among employees (Pohl and Galletta, 2017) and has been found to weaken WFC experienced by employees (Karatepe and Kilic, 2007; Frone *et al.*, 1992; Selvarajan *et al.*, 2013). Managerial support is the extent to which managers appreciate employees' contributions, care about their subordinates' well-being and are attentive to employee needs (Eisenberger *et al.*, 2002).

Our study extends work–family research in several ways. First, we test the mediating role of WFC between managerial support and both job satisfaction and affective commitment (see Figure 1). Recent studies have found that the effect of managerial support on job satisfaction was mediated by WFC (Drummond *et al.*, 2017; Hwang and Ramadoss, 2017). A meta-analysis also tested the mediating role of WFC in the relationship between general work support (including support from supervisors, colleagues and organisation) and job satisfaction (Ford *et al.*, 2007). However, little is known about whether WFC mediates the relationship between managerial support and *affective commitment* (see the Table A1 for key information on relevant studies).

Past studies have mainly explored separate elements of our model. A number of studies found direct effect of work–family related support from managers on job satisfaction (e.g. Babin and Boles, 1996; Charoensukmongkol *et al.*, 2016; Hwang and Ramadoss, 2017; Lapierre *et al.*, 2008; Qureshi *et al.*, 2018) and affective commitment (e.g. Talukder *et al.*, 2018; Thompson *et al.*, 1999; Wayne *et al.*, 2013). Literature has also established the negative association between WFC and the concerned two outcome variables. For example, Choi and Kim (2012) and Gözükara and Çolakoğlu (2016) show that WFC has a detrimental impact on job satisfaction; whereas Allen *et al.* (2000), Talukder *et al.* (2018) and Qureshi *et al.* (2019) suggest WFC is negatively associated with affective commitment. However, to our knowledge, the model proposed in Figure 1 has not been previously tested.

Second, it theorises a process by which the provision of managerial support for employees to manage their work and life roles accounts for an increase in affective commitment and job satisfaction among employees. We use leader–member exchange (LMX) theory (Deluga, 1994), which is underpinned by social exchange theory (Blau, 1964) and the norm of reciprocity (Gouldner, 1960). We postulate that supporting a subordinate employee in managing competing work–life demands (Eisenberger *et al.*, 2002) helps decrease the level of WFC experienced by the employee (Anderson *et al.*, 2002; Kim and Mullins, 2016; Lapierre and Allen, 2006; Mas-Machuca *et al.*, 2016; Pluut *et al.*, 2018; Talukder *et al.*, 2018; Thompson *et al.*, 1999). The employee will reciprocate with affective responses in terms of affective commitment and job satisfaction (Birtch *et al.*, 2015; Major and Lauzun, 2010).

Third, our theoretical model was tested in the Australian context. WFC and related issues such as stress (Smith *et al.*, 2002; Turner *et al.*, 2014) have been considered as common among Australian employees (Skinner and Chapman, 2013). Despite reforms in childcare, parental leave and employment regulations over the past two decades, WFC continues to be a challenge in Australia. Many Australian employees were found to have encountered high

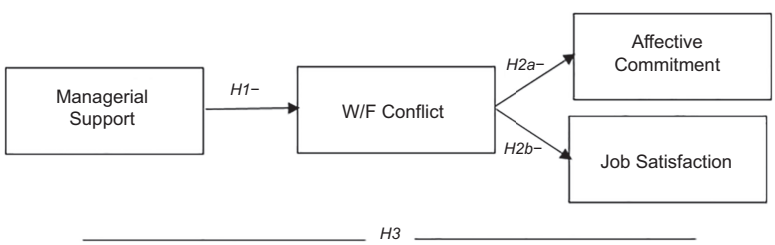

Figure 1.
Theoretical model

levels of WFC (Skinner and Pocock, 2014). WFC has received the attention from scholars, government, employers and employees (De Cieri *et al.*, 2005; Zheng *et al.*, 2016). Capturing the role of support from managers for employees to alleviate the conflict between work and family roles has the potential for organisations to understand the reciprocal exchange and in turn, to arrange necessary support in pursuit of desired employee attitudes and behaviour.

Theoretical foundation and hypotheses development

In building the theoretical model (as displayed in Figure 1), we draw on the LMX theory to investigate the process through which WFC could be alleviated and lead to positive employee outcomes, including affective commitment and job satisfaction. The theory posits that LMX emerges from the social exchange between a manager and employee, wherein the negotiation of the employee's work role occurs through reciprocities between the two parties (Deluga, 1994; Major and Lauzun, 2010). Consistent with social exchange theory (Blau, 1964), the LMX theory advances the idea that reciprocity arises from the (perceived) fulfilment of needs and expectations by both parties in the relationship (Birtch *et al.*, 2015). The LMX framework incorporates a focus on the quality of the manager–subordinate relationship (Gerstner and Day, 1997).

In addition, LMX and family-supportive managerial behaviour reportedly generate a positive environment in which both components influence and strengthen each other (Tummers and Bronkhorst, 2014). As noted by Graen and Scandura (1987, p. 182), it is crucial to the LMX quality that "each party must offer something the other party sees as valuable and each party must see the exchange as reasonably equitable or fair". Low-quality LMX relationships are characterised by transactional interactions, determined by the employment contract (Litano *et al.*, 2016), in which employees receive standard benefits, including salary, superannuation and sick leave, in exchange for fulfilling formal job duties (Lapierre *et al.*, 2006). By contrast, in high-quality LMX relationships, both instrumental and affective forms of support are increased (Bernas and Major, 2000) due to reciprocal exchanges between the manager and employee (Tummers and Bronkhorst, 2014).

The LMX theory suggests that when employees perceive that the manager is fulfilling his or her part of the LMX process through generating a family-friendly work environment and offering support for a range of work-related and life (personal) matters (Gözükara and ; Odriozola and Baraibar-Diez, 2018), reciprocity should emerge. On the basis of reciprocity, the exchange relationship between employees and managers (and the organisation) is formed (de Juana-Espinosa and Rakowska, 2018). This relationship is manifested in employees' inclination to demonstrate positive behaviours and attitudes towards the organisation (and manager) and job (Talukder *et al.*, 2018), including affective commitment and job satisfaction (Birtch *et al.*, 2015).

Managerial support and WFC

Research shows that high LMX is associated with lessened WFC. Using a sample of Dutch healthcare professionals, Tummers and Bronkhorst (2014) found that high LMX was negatively correlated with work–family interference, a construct that is closely related to WFC. Similar negative relationships have also been reported when examining the relationship between LMX and two types of WFC (Gutek *et al.*, 1991), namely family interference with work and work interference with family. Lapierre *et al.* (2006), for instance, reported a negative relationship between LMX and family interference with work in their study of a Canadian non-profit organisation. Studies conducted by Bernas and Major (2000) and Major *et al.* (2008) have found a negative relationship between LMX and work interference with family.

A general consensus in the literature is that managerial support has beneficial effects on work–family experiences among employees (Litano *et al.*, 2016). Scholars have contended that

managerial support exerts a stronger influence on work-to-family conflict, as opposed to family-to-work conflict, since the source of support is work-related (Frone *et al.*, 1992; Selvarajan *et al.*, 2013). Karatepe and Kilic (2007) have lent empirical support to the relationship between managerial support and work-to-family conflict. This finding is consistent with that of Thomas and Ganster (1995). Similarly, results in a longitudinal study pertain to the relationship between work-to-family conflict and turnover intentions, which is most effectively buffered by support stemming from the work domain (Nohe and Sonntag, 2014).

Managers who display accommodating behaviours and compassion for employees' work and family responsibilities can have a significant impact on employees' endeavour to achieve work–life balance (Talukder *et al.*, 2018; Thomas and Ganster, 1995). These managers serve as a source of instrumental and emotional assistance to buffer work-related demands (Choi, 2020). Support for work–life initiatives from managers propagates employees' perceptions of balance between their work and personal (life) commitments (Mas-Machuca *et al.*, 2016). Indeed, managerial support is considered as a crucial workplace resource conducive to employees' achievement of better work–life balance (Greenhaus *et al.*, 2012), including perceived decreased role conflict, specifically, decreased WFC (Talukder *et al.*, 2018).

For instance, flexible working hours may optimise employees' ability to fulfil both work and non-work responsibilities (Russo *et al.*, 2016). From a work–family perspective, Major and Lauzun (2010) suggest that not only does a manager appreciate an employee's contributions, the manager is also interested in ensuring that the employee feels appreciated and maintains productivity at work, including providing employees with assistance to handle work–family issues. Likewise, the employee could be inclined to contribute to the manager's goals and be confident in the manager's propensity for appropriate help and acknowledgement, namely aiding in the employee's ability to manage work–family demands. A meta-analysis suggests that support of immediate managers and positive work–family experience among employees are strongly related (Kossek *et al.*, 2011). Empirical literature has also established that a supportive manager plays a pivotal role in reducing WFC (e.g. Allen, 2001; Behson, 2002; Thompson *et al.*, 1999). Allen (2001) explains that managerial support exerts influence over employees' perceptions of their organisation's family-supportiveness, which could lead to reduced WFC. O'Driscoll *et al.* (2003) found that employees supervised by managers who provide more support for work–family balance reported less psychological strain than those with lower levels of managerial support. Managerial support is of great importance in work–family balance (Greenhaus *et al.*, 2012; Gözükara and Çolakoğlu, 2015), due to its alleviating effects on work–family tension (Beehr *et al.*, 2000).

The work-to-family type of conflict reflects the extent to which participation in the family role is complicated as a result of participation in the work role (Greenhaus and Beutell, 1985). From this perspective, antecedents of WFC arise from the work domain, and the levels of work resources and work demands are associated with WFC (Byron, 2005; Michel *et al.*, 2011). Therefore, the provision of managerial support for employees to participate in the family domain is likely to ameliorate the role demands at work interfering in family responsibilities (i.e. WFC). The present study therefore proposes the following hypothesis:

H1. Managerial support will be negatively associated with WFC.

WFC and affective commitment, job satisfaction

Affective commitment, as a component of organisational commitment (Meyer and Allen, 1991), is related to the role or roles of an individual within the social organisation, which could evoke satisfaction or stress experienced by the individual (Benligiray and Sönmez, 2012). Affective commitment is a form of psychological attachment originated from sense of pride and loyalty to an organisation or the manager as the organisation's representative (Allen and

Meyer, 1990; Meyer *et al.*, 2015), and is likely to be influenced by job- or role-related characteristics (i.e. job demands and resources) (Mowday *et al.*, 1982).

Job satisfaction emanates from employees' favourable evaluations of the job (Locke, 1976). Detrimental job characteristics that cause incompatible requirements arising from one's work and family roles that potentially have restraining influences on role fulfilment (Greenhaus and Beutell, 1985) could be minimised by manager support or "psychologically and functionally useful resources" for employees to achieve work–life balance (Kossek *et al.*, 2011, p. 294). Research has established that a common way in which employees reciprocate to their manager (and organisation) entails developing strong affective and socio-emotional attachment, including affective commitment and job satisfaction (Birtch *et al.*, 2015; Gözükara and Çolakoğlu, 2015; Mukanzi and Senaji, 2017).

According to Thompson *et al.* (1999), family-supportive management with goodwill and intention to assist employees in balancing work–family responsibilities could evoke feelings of attachment from employees, including affective commitment and intention to leave. Similarly, a recent study conducted in the Australian financial sector revealed the significant role of managerial support in promoting work–life balance (i.e. decreased WFC), which subsequently affected employee attitudes, including job satisfaction, organisational commitment and life satisfaction (Talukder *et al.*, 2018). Furthermore, substantial evidence suggests that affective commitment and job satisfaction are improved when an individual experiences fewer conflicts at the work–life interface. Meta-analytic evidence shows that WFC negatively impacts affective commitment and job satisfaction (Allen *et al.*, 2000; Kossek and Ozeki, 1998). Results from a number of studies (e.g. Boles *et al.*, 1997; Cannon, 1998; Good *et al.*, 1988; Weale *et al.*, 2019) reveal that WFC is related to a lower degree of job satisfaction and affective commitment. Drawing upon the LMX concepts and presented research evidence, it is proposed that:

H2a. WFC will be negatively associated with affective commitment.

H2b. WFC will be negatively associated with job satisfaction.

The mediating role of WFC

The above hypotheses combine to form a mediation model. In the present study, we applied the LMX framework, which is rooted in social exchange theory (Blau, 1964; Deluga, 1994), to theorise the process in which WFC will mediate the relationship between managerial support and employees' affective and socio-emotional outcomes, including affective commitment and job satisfaction. We predict that it is likely that managerial support will lessen the level of conflicts between employees' work and life roles (Hypothesis1), which in turn will promote affective commitment (Hypothesis 2a) and job satisfaction (Hypothesis 2b). Therefore:

H3a. WFC will mediate the relationship between managerial support and affective commitment.

H3b. WFC will mediate the relationship between managerial support and job satisfaction.

Methods

The study used a cross-sectional design, and data were collected through a survey of employees from an Australian manufacturing organisation.

Sample and data collection

The sampling frame comprised all employees of an Australian manufacturing organisation. Initially multiple organisations were approached, however only one organisation agreed to

participate and provided access to its employees. An e-survey link was sent to each employee via the HR manager. The responses were directly received by the researchers, with no involvement of the HR manager. Employees' self-reported data were collected as opposed to peer or supervisor ratings, objective observations or archival data. The data were collected between July 2013 to September 2013. A total of 250 employees were sent a survey. After deleting incomplete responses, 134 surveys with all questions answered led to a response rate of 53.6%. Final sample size was within the acceptable range of 30–500 responses, defined by scholarly standards (Roscoe, 1975). It also fulfils the various rules of thumb, such as $50 + k$ (Harris, 1975), $5k$ (Tabachnick and Fidell, 1989), $50 + 8k$ (Green, 1991) and 100 (Combs, 2010). The value of k for the current study is 4. The respondents comprised 75% male and 25% female, with a mean age of 45 years. Of participating employees, 62.5% were below the age of 45, and 47.8% had the European/Anglo-American background.

Measures

This study uses four latent variables measured through multiple indicators which represent the underlying constructs (Byrne, 1998). These indicators are repeatedly used in the literature for the measurement of these latent constructs that cannot be directly measured (e.g. Bergami and Bagozzi, 2000; Boyar *et al.*, 2005). This is referred as parcelling in literature that involves "averaging or summing several raw items to form a single score, which can then be used as an indicator of a latent variable" (Sterba, 2011, p. 554). Hence, the main four variables (see Figure 1) are based on reflective scales where the measured items "jointly influence the latent construct, and meaning emanates from the measures to the construct in the sense that the full meaning of the composite latent construct is derived from its measures" (MacKenzie *et al.*, 2005, p. 713). The responses to the items were averaged to create the final score for the construct (e.g. Armstrong *et al.*, 2010; Liao *et al.*, 2009), as these indicators reflect the heterogeneous causes of latent construct (Jarvis *et al.*, 2003). Empirical justifications for averaging items include attaining normality, enhancing reliability and achieving a better model fit (Bandalos and Finney, 2001). Summing items can lead to misleading values in the presence of missing responses to some items.

Predictors. Work–family related *managerial support* was measured by an eleven-item scale developed by Thompson *et al.* (1999), with a reported reliability of 0.91. The exploratory factor analysis was run to check the validity of the scale with the current data. Three items were dropped from the scale due to factor loadings below 0.4. A sample item is "In general, managers are quite accommodating of family-related needs". The Cronbach's alpha value for the current study is 0.875. Scales were reported on a five-point Likert scale from "1" representing "strongly disagree" to "5" representing "strongly agree".

Outcomes. A seven-item scale was used to measure *job satisfaction,* developed by King *et al.* (2012), asking the degree of employee satisfaction with respect to different aspects of the job, for example "support from immediate manager" and "value of work". The reported reliability of the scale was 0.86. The Cronbach's alpha value for the current study is 0.89. *Affective commitment* was measured using a four-item scale originally developed by Allen and Meyer (1990). The sample item is "Working at this organisation has a great deal of personal meaning to me". The scale measures the emotional attachment, identification and involvement of employees with the organisation. The Cronbach's alpha value for the current study is 0.84. For both scales, employees reported on a five-point Likert scale from "very dissatisfied" to "very satisfied".

Mediator. The mediating variable of *WFC* was measured with a scale used by Netemeyer *et al.* (1996), with a reported reliability of 0.88. The scale comprised five items, for example, "The demands of my work interfere with my home and family life". Employees reported on five response choices ranging from "strongly disagree" to "strongly agree". The Cronbach's alpha for the current study is 0.94.

Controls. The analysis controlled for the effects of gender and age. Participant gender was coded as a dummy variable, where "0" = male and "1" = female. Age was an open-ended question in the survey. To convert it into a categorical variable, we calculated the median value of age and created two categories above and below the median value. Lower values were represented by "0", while the upper values were represented by "1". A total of 51.5% of the values lay below the median value.

Results

Means, correlations and standard deviations for all variables in the theoretical model are presented in Table 1. The data were checked for multivariate assumptions through Cook's distance, skewness, kurtosis and collinearity diagnostics. All the values were below 0.1 for Cook's distance hence showing no outliers (Cook, 1977). Similar was the case for skewness, kurtosis and variation inflation factor (VIF) values. The Mardia's standardised coefficient value is a multivariate measure of normality. Its value equal to or less than 1.96 indicates multivariate normality of the data (e.g. Vargas-Halabí *et al.*, 2017). For the proposed model, the value is 1.711 indicating the normality of data. Fornell-Larcker (1981) criterion has been used to establish the convergent and discriminant validity of the constructs. According to the criterion, the convergent validity can be assessed through average variance extracted (AVE), with the values above 0.5 acceptable. For the current model the AVE values for all the construct are above 0.5, indicating the presence of convergent validity of the constructs (see Table 2). On the other hand, the criterion proposes the presence of discriminant validity if the square root of AVE for each construct is greater than the correlations involving the constructs. The results fulfil the criterion for the presence of discriminant validity in the current data. At the same time the correlation coefficient values for all variables were below 0.5, indicating convergent and discriminant validity of the data. Convergent and discriminant validity of variables were also established through exploratory and confirmatory factor analysis, where all factor loadings were above 0.5 (see Table 2: Cunningham *et al.*, 2001;

VARIABLE	MEAN	SD	1	2	3	4	5
Predictors							
1. Managerial support	*3.60*	*0.575*					
Mediator							
2. Work–family conflict	2.69	0.969	−0.177*				
Outcome							
3. Affective commitment	3.43	0.710	0.477**	−0.206*			
4. Job satisfaction	3.81	0.640	0.110	−0.345**	0.254**		
Controls							
5. Gender	0.27	0.445	0.069	−0.026	0.201*	−0.076	
6. Age	1.49	0.502	−0.179*	0.017	0.039	−0.016	−0.182*

Note(s): *$p < 0.05$ (2-tailed). **$p < 0.01$ (2-tailed)

Table 1. Means, standard deviations and correlations

Variable	Reliability	Convergent validity
Managerial support	0.87	0.50
Work–family conflict	0.94	0.74
Affective commitment	0.84	0.51
Job satisfaction	0.89	0.56

Table 2. Construct reliability and validity

Tharenou *et al.*, 2007). The cross-sectional nature of data may also pose threats of common method bias (Podsakoff *et al.*, 2003). Consistent with past literature, the statistical procedures were used to reduce the bias (e.g. Bitrian *et al.*, 2020; Erkutlu and Chafra, 2019). Therefore, Harmon's single factor test was conducted to exclude superfluous items. The results indicate that 35.15% of total variance was explained by single factor, demonstrating no risk of common method bias.

The structural equation modelling (SEM) technique in Analysis of Moment Structures (AMOS) was used to test the hypothesised model shown in Figure 1. Hypotheses 1, 2a and 2b state the direct relationships in the model. Hypothesis 1 proposes that work–family related managerial support is negatively associated with WFC ($\beta = -0.40$, $\alpha < 0.05$). Hypotheses 2a and 2b anticipate that WFC is negatively related to affective commitment ($\beta = -0.51$, $\alpha < 0.001$) and job satisfaction ($\beta = -0.42$, $\alpha < 0.001$), respectively. Table 3 presents the estimates and significance of the direct effects in the model. The 95% confidence interval using 5000 bias corrected samples does not include zero, reporting the relationships to be significant.

Hypothesis 3a states that WFC will mediate the relationship between managerial support and affective commitment ($\beta = 0.32$, LLCI = 0.007, ULCI = 0.140, $\alpha < 0.05$), whereas hypothesis 3b predicts the mediating influence of WFC on the relationship of managerial support and job satisfaction ($\beta = 0.30$, LLCI = 0.010, ULCI = 0.167, $\alpha < 0.05$). The results (presented in Table 4) indicate that managerial support had a positively significant effect on affective commitment and job satisfaction via WFC. The 95% confidence interval using 5000 bias corrected samples does not include zero, reporting the relationships to be significant.

The chi-square to the degrees of freedom ratio for the complete model is 1.627, suggesting that the model is fit for the data. The root mean square error of approximation (RMSEA) is the most used index to check model fitness (McDonald and Ho, 2002). For the proposed model, the RMSEA value is 0.05, indicating a model fit (Schumacker and Lomax, 2004; Steiger, 2007). Other absolute fit value measures are the goodness of fit index (GFI) and adjusted goodness of fit index (AGFI). For the proposed model, the GFI and AGFI values are 0.977 and 0.919, respectively, showing acceptable variance for the study (Hooper *et al.*, 2008). The incremental fit indices mostly reported for SEM are the comparative fit index (CFI), normed fit index (NFI) and Tucker Lewis index (TLI). The CFI, NFI and TLI values for the proposed model are 0.954,

Table 3.
Direct effects

Predictor	Outcome	Estimate	LLCI – ULCI
Managerial support	Work–family conflict	−0.40**	−0.622 – −0.036
Work–family conflict	Affective commitment	−0.51***	−0.267 – −0.092
Work–family conflict	Job satisfaction	−0.42***	−0.330 – −0.116

Note(s): ***$p < 0.001$, **$p < 0.05$
Bootstrap sample size = 5000 bias corrected, LL = lower limit, UL = upper limit, CI= Confidence Interval, Level of confidence = 95%

Table 4.
Mediating effects

Predictor	Mediator	Outcome	Estimate	LLCI – ULCI
Managerial support	Work–family conflict	Affective commitment	0.32**	0.007–0.140
Managerial support	Work–family conflict	Job satisfaction	0.30**	0.010–0.167

Note(s): **$p < 0.05$
Bootstrap sample size = 5000 bias corrected, LL = lower limit, UL = upper limit, CI= Confidence Interval, Level of confidence = 95%

0.90 and 0.886, respectively. According to Schumacker and Lomax (2004), values approaching one are treated as good and acceptable. All the parsimonious, absolute and incremental fit indices show the proposed model fit for the study.

Discussion

The basic purpose of this paper was to explore whether: (1) managerial support decreases WFC, (2) WFC is negatively associated with affective commitment and job satisfaction, and (3) WFC mediates the relationship between managerial support and outcomes (affective commitment and job satisfaction). The results reveal all the proposed relationships are significant.

The results indicate a negative relationship between work–family related managerial support and WFC. Our findings support and strengthen the literature suggesting decrease in WFC because of managerial support (e.g. Allen, 2001; Drummond *et al.*, 2017; Frone *et al.*, 1992; Karatepe and Kilic, 2007; Pluut *et al.*, 2018; Selvarajan *et al.*, 2013; Thomas and Ganster, 1995). For example, Pluut *et al.* (2018) stated that supervisor's support mitigates the within-individual workload effects on emotional exhaustion which reduces WFC. Kossek *et al.* (2011) reported a strong relationship between immediate manager support and work–family experience. Managerial support is also found to exert influence on employees' perceptions of an organisation's family supportiveness, which can lead to lower WFC (Allen, 2001). Similarly, Drummond *et al.* (2017) and Lapierre *et al.* (2008) found negative association between supervisory support and WFC.

Furthermore, the negative association between WFC and affective commitment/job satisfaction found in this study is widely supported in the literature (e.g. Allen *et al.*, 2000; Boles *et al.*, 1997; Cannon, 1998; Good *et al.*, 1988; Gözükara and Çolakoğlu, 2016; Kossek and Ozeki, 1998; McDowell *et al.*, 2019; Qureshi *et al.*, 2019). For example, Weale *et al.* (2019) found a significant association between WFC and job satisfaction among residential aged care employees. Choi and Kim (2012) and Grandey *et al.* (2005) reported an increase in job satisfaction with the decrease in WFC. Regarding commitment, Qureshi *et al.* (2019) reported a significant negative relationship between WFC and affective commitment. Lyness and Thompson (1997) also found negative association between WFC and affective commitment. Meta-analytic evidence has also attributed WFC to a broad range of employee outcomes, such as job dissatisfaction, low organisational commitment and high turnover intention (Allen *et al.*, 2000; Eby *et al.*, 2005; Mesmer-Magnus and Viswesvaran, 2005). Therefore, the findings of the current study strengthen the evidence for negative effects of WFC on job satisfaction and effective commitment.

Our findings indicate that the mediating relationships of managerial support–WFC–outcomes are also significant. This study provides pioneering evidence of the mediating role of WFC in the relationship between managerial support and affective commitment. However, the mediating relationship of managerial support–WFC–job satisfaction has been previously studied by Anderson *et al.* (2002) and Hwang and Ramadoss (2017). They reported significant mediation of WFC in the relationship of managerial support and job satisfaction. There is adequate theoretical support for the results via LMX theory. The LMX theory suggests that managers' fulfilment of needs and expectations lead employees to reciprocate the same behaviour towards their managers and the organisation (Birtch *et al.*, 2015; Gözükara and Çolakoğlu, 2015; Odriozola and Baraibar-Diez, 2018). The quality of this exchange relationship holds much importance (Gerstner and Day, 1997; Solís, 2017).

Theoretical and research contributions

This study makes various theoretical and research contributions. *First,* the findings provide support for LMX theory (Deluga, 1994), that is based on social exchange theory and its norm

of reciprocity (Blau, 1964; Gouldner, 1960). The fulfilment of needs and expectations of managers and employees through positive social exchange (de Juana-Espinosa and Rakowska, 2018) underpins the philosophy of LMX theory (Birtch *et al.*, 2015; Deluga, 1994; Major and Lauzun, 2010). Therefore, the decrease in the level of WFC experienced by employees, due to managers caring for employee well-being and family-supportive behaviour, led employee to reciprocate positively in the form of enhance affective commitment and job satisfaction (Birtch *et al.*, 2015; Eisenberger *et al.*, 2002). *Second*, the findings provide empirical evidence for the negative linear relationship between managerial support and WFC, and WFC and affective commitment/job satisfaction**.** This strengthens the argument that demonstration of family-supportive behaviours from managers helps employees to manage work–life demands effectively, reducing WFC (Drummond *et al.*, 2017; Eisenberger *et al.*, 2002; Pluut *et al.*, 2018) and leading to affective responses from employees in terms of commitment and job satisfaction (Birtch *et al.*, 2015; Qureshi *et al.*, 2019). This study focuses on managerial support as it has been considered as most useful and valuable for employees (Ng and Sorensen, 2008).

Third, this study addresses a gap in the literature by reporting the direct and mediating relationships in the Australian context that have not previously been explored. Researchers can also further explore the proposed framework in different cultural settings with larger data sets and longitudinal analyses. The influence and type of managerial support and facets of WFC might differ in developed, developing and under-developing cultures. Our research used the limited number of variables to undertake the focused study rather than the comprehensive study; however, WFC also has a number of other predictors that need to be further investigated, like work–family culture, work-role ambiguity, co-worker support, task autonomy, schedule flexibility and so on (Michel *et al.*, 2011; Thompson *et al.*, 1999). Similarly, managerial support and WFC can influence employee behaviours and outcomes at a larger level. Analysing larger sets of predictors and outcomes of WFC can help understand the reasons for the increase/decrease in WFC.

Fourth, the study provides pioneering evidence for the significant mediating effect of WFC on the relationship of managerial support and outcomes (affective commitment and job satisfaction). Studies can also be undertaken to compare the level of managerial support and family support in enhancing or reducing WFC (Madhavi, 2015; Michel *et al.*, 2011). At the same time, employee personality traits can also play a vital role in defining WFC (Michel *et al.*, 2011).

Practical implications

Managerial support has been considered as the most important and valuable resource for employees to reduce WFC (Kossek *et al.*, 2011; Ng and Sorensen, 2008). According to a survey by the Melbourne Institute: Applied Economic and Social Research, employees facing WFC can face problems in their work performance, their children's functioning and their family life (Wilkins *et al.*, 2019). WFC and stress in lives have been considered as common among Australian workers (Skinner and Chapman, 2013). The supportive and accommodating work–family climate among managers and employees can help employees achieve a balance (Talukder *et al.*, 2018; Thomas and Ganster, 1995) as they find instrumental and emotional assistance to fulfil work-related demands (Choi, 2020). Increasing attention of organisations' impact on the manager–employee relationship requires firms to focus on the quality of this exchange relationship. Therefore, evaluating the pros and cons of this relationship holds significant practical implications. The proposed theoretical framework helps organisations to understand this reciprocal relationship and its consequences. The more positive managerial support employees receive, the more positive their behaviours will be towards the organisation due to decreased conflict in their work and family lives. The improved

relationships among managers and employees will ultimately result in better outcomes for both employees and the organisation.

The HILDA Survey (Wilkins *et al.*, 2019) states that 12% of employees facing high WFC for around five years will certainly leave employment. This shows that if organisations understand the reasons for WFC and successfully create a family-supportive environment, they can develop a positive exchange relationship between managers and employees, leading to more positive outcomes. This study draws attention to the importance of managerial support in reducing WFC as managerial support plays a critical role in mitigating WFC (Goh *et al.*, 2015). Managers' family-supportive behaviour towards employees will eventually force employees to reciprocate positive behaviours and attitudes towards the organisation (Bettencourt and Brown, 1997; Hicks-Clarke and Iles, 2000; Mor Barak and Levin, 2002). Organisations can invest in training their managers to maximise their family-supportive behaviours (Hammer *et al.*, 2011; Mukanzi and Senaji, 2017); this will help managers to use resources to enhance employee well-being and alleviate the negative effects of a high workload.

According to a media release in 2019 by Australian Institute of Family Studies (AIFS, 2019) vis Australian Government, the incompatible work and family demands are a source of threat to the mental health of mothers as well as fathers. Fathers experiencing high WFC have reported to be psychologically distressed, and thus reduction in WFC can significantly improve their mental health (Cooklin, 2018). Therefore, it is important for organisations to boost managers' training to support employee health and well-being to reap benefits of the most critical resource of the organisation and to make it their competitive edge. Such training will aid them to communicate effectively with their workers and develop compatible working roles to enhance positive employee outcomes like affective commitment and job satisfaction (Deluga, 1994; Major and Lauzun, 2010). These positive outcomes will ultimately enhance organisational productivity.

Limitations

This study holds certain limitations. First, only managerial support is considered as the predictor of WFC, whereas many other organisational and family factors can influence WFC. Future research can account for additional predictors of WFC, such as work/family behaviour support, family non-supportive culture and work/family culture (Glaveli *et al.*, 2013; Thompson *et al.*, 1999). Second, this study was conducted in the Australian context—the influence and support of managers may differ in other cultural settings. Third, the limited sample size and inclusion of only one manufacturing organisation may limit the generalisability of the findings. Fourth, the study uses a cross-sectional, single-source, self-reported data design. This can constitute a risk of common method variance and does not allow for causal inferences. Future research can expand the scope of the study by using a longitudinal design to assess the relationships.

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Appendix

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Circular economy-based reverse logistics: dynamic interplay between sustainable resource commitment and financial performance

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Abstract

Purpose – The study aims to propose a circular economy-based reverse logistics (CERL) that emphasises the mediation effect of reverse logistics (RL) on sustainable resource commitment and financial performance.
Design/methodology/approach – The structural equation modelling (SEM) approach has been applied to analyse the data acquired through the survey method that included 113 vendors of automotive supplies of the 1st and 2nd levels.
Findings – The results confirm that CERL acts as an essential intervening entity between resources and financial performance. The findings of the study have provided research and development (R&D) opportunities for the industries to find alternative revenue streams and generate profit from resource investment whilst upholding environmental standards through reverse logistic practices.
Practical implications – Reverse logistic practices are the key components of a circular business model and a sustainable supply chain. The manufacturing companies need to explore critical enablers that can contribute to business productivity and financial growth.
Originality/value – The study has validated a CERL model that portrays the circular economy's resilient relationship with RL practices.

Keywords Circular economy, Reverse logistics, Resource commitment, Natural-resource-based view, Automotive, Importance-performance map analysis

Paper type Research paper

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1. Introduction

The automotive industry is one of the leading contributors to industrial waste, affecting environmental and financial efficiency (Fernando *et al.*, 2018). The rising demand for automotive products has led to the rapid accumulation of vehicle waste and issues with recycling that eventually created environmental violations (Saraiva *et al.*, 2020). Hence, RL, a sustainable business practice, is needed to assist a company in enhancing material utilisation and reducing cost (Chan *et al.*, 2020). Further, it helps establish practices with lower-environmental impact (CRR, 2015). The environmental performance can be improved by reducing environmental degradation and improving operational performance by eliminating surplus raw materials and scraps for recycling (Fernando *et al.*, 2019).

RL is the part of firms' competency to effectively utilise the resources to handle product returns (Autry *et al.*, 2001). Although RL is not a new concept, there is a need to create a collaborative mechanism to accommodate a circular economy based on RL activities. The firms need to have sufficient capacity to respond to the demand for returnable products and avoid waste and pollution generation (de Campos *et al.*, 2020).

In the automotive sector, RL offers companies an option to improve financial performance by receiving new market segments revenue such as retrofitting and remanufacturing (Chan *et al.*, 2020). Therefore, the favourable constructs of RL and the resource allotment in achieving better performance are given lesser attention. Moreover, previous studies have shown that companies are not fully motivated to follow RL programs, since they demanded additional investment and commitment (Abbas and Farooquie, 2020). After re-fabrication, the market growth contributed 10% to the overall automotive sector with less contribution from the Malaysian-based automotive industry (US ITC, 2012). Furthermore, reverse supply chain networks are also challenging to manage because of the volatile return rate (Tosarkani *et al.*, 2020). In-depth research is now underway in companies to visualise how RL affects financial performance indirectly (Govindan and Soleimani, 2017).

In terms of profitability, the current economic situation, the pandemic and global competition have struck the non-resilient automotive companies (Pirttilä *et al.*, 2020). Declining sales, increased competition and manufacturing costs directly pressure the industry (Sanni *et al.*, 2020). The challenges can be managed through efficient inventory with integration of the forward logistics (Fernando *et al.*, 2020).

As described in the Sustainable Development Policy of the EU, encouraging sustainable consumption and production is the best option for continuously improving well-being (Jonkutė and Staniškis, 2016). However, the automotive industry contributes to greenhouse gas (GHG) emissions and cannot cope with automotive waste (Passarini *et al.*, 2012). Globally, the number of new cars tends to grow annually. Because of its complexity and increasing quantity, the waste produced by end-of-life vehicles (ELVs) is another issue. European ELVs rose by 40% and exceeded 14 million tonnes from 2010 to 2015 (Passarini *et al.*, 2012).

Most logistic activities are from producers to customers and significantly less attention has been paid to product return and recall (Hofmann and Visagie, 2020). Hence, businesses need to merge their potential logistics process with RL protocol for better revenue prospects (Fernando *et al.*, 2017). However, there is little guidance on how they can attain sustainability and enhance financial performance via RL. Although the literature has widely discussed resource commitment and RL, only a very few empirical studies connect this success to financial performance (Niţă and Ştefea, 2014). The indirect path is not well covered in the literature. Scanty evidence is present to justify that sustainable resource commitment plays a critical role to leverage financial performance. Besides, RL is not often covered as a core competence in automotive businesses. New business models demand more green-oriented production activities that comply with recycling and restructuring architecture. Material reusability, energy quality and recyclability need to be carefully managed. It will assist the

decision-makers, can keep track of them and ensure that they meet operational specifications (Giampieri *et al.*, 2020).

However, ignoring the RL outcomes of today's supply chain frameworks is inconsistent with previous findings. Kirchoff *et al.* (2018) argued that RL implementation rubrics and procedures are still unclear. It calls for scholars to further strengthen the theory of circular-based supply chain management, particularly RL as the drivers and the existing supply chain framework (Julianelli *et al.*, 2020). However, the development of a supply chain framework that meets the requirements of today's manufacturing industry needs to have a mediation model that helps to clarify its performance between companies' sustainable resource allocation and RL (Kirchoff *et al.*, 2018).

Automotive sectors strictly require a sustainable circular chain of a commendable business value that can withstand customer refusals, recall, transformation and safe disposal. RL helps directly to develop, enable and improve a circular supply chain model based on eco-innovation policies (Geissdoerfer *et al.*, 2018). Moreover, due to the growing concern on environmental sustainability and cost saving, manufacturing companies have started to produce new products through circular business models (Prieto-Sandoval *et al.*, 2018). The idea of RL has driven proper solid management systems and set up a transitional platform driven towards the circular economy activity (Guarnieri *et al.*, 2020). Batista *et al.* (2018) postulated that the circularity concept had given potential returns to companies and society.

Furthermore, RL has been technically associated with the circular economy and sustainability (Merli *et al.*, 2018). Despite having a similar concept, the circular economy and RL are discussed separately. It was neglected how the circular economy works well, mimicking the concepts of RL.

This paper aims to examine the emerging concept of CERL and evaluate it as the mediating effect of sustainable resource commitment and financial performance through the mediation of RL practices. This study provides empirical data on CERL practices that lack evidence from the literature, particularly in developing countries such as Malaysia. Although previous literature on RL is precise, CERL is still in the development stage and financial interventions and related practical implications are still not explored. This study thus provides empirical evidence of the CERL model, which predicts the impact of sustainable resource commitment on financial performance.

In practical terms, this paper will help an automotive company to wisely utilise sustainable resources and invest in suitable green technology. In addition, companies can use this study to further develop and improve CERL for business sustainability. At first, this paper discusses the past studies that are related to the main variables, the theoretical model and the hypotheses. Then, the method employed in this study is presented, followed by findings, discussion-based conclusions and importance performance map analysis (IPMA). Last is the conclusion of this study, including limitations and directions for future research.

2. Theoretical framework

Companies must comprehend how environmental management can help them attain financial success. Companies have long recognised the need to effectively manage their resources to gain a competitive advantage and improve performance. According to Barney (1991), the resource-based view theory (RBV) has underpinning theory to predict enablers of adequate resources management to achieve performance. The RBV theory sheds light on the importance of resource commitment and how organisations that manage their resources can be crafted as distinctive, having a competitive advantage through improved performance.

It is challenging to retain competitive advantage or consistently achieve performance when environmental and technological advancements are the centre of attention in the current business environment. Thus, Davcik and Sharma (2016) suggested that companies' decisions on resource management start with how many resources

companies are willing to commit for their product or supply chain process. As a result, resource commitment severely impacts the overall implementation of the product revenues (Maiti *et al.*, 2020).

Environmental practice has an impact on business performance and attracts stakeholders' attention. Moreover, previous scholars had previously criticised the RBV theory for not considering the external environment of the companies. Hart (1995) established the natural RBV (NRBV) theory as an effective alternative and a guiding pathway for competitive advantage by closely considering eco-friendly and sustainability factors. This argument was exacerbated further by stakeholder pressure on firms to take a proactive approach to environmental protection. The adoption of NRBV theory is also motivated by the concept of social responsibility (Lopez-Becerra and Alcon, 2021).

Thus, it is no longer acceptable for companies to rely on resource commitment practice alone to achieve performance and competitive advantage. RBV theory's limitation cannot provide better guidance for companies to adapt to the dynamic and complex stakeholders' environmental-based requirements. Michalisin and Stinchfield (2010) suggested the limitation of RBV can be solved using NRBV, where it explains the heterogeneity of constraints imposed by natural resources, which considers environmental practices as primary drivers to achieve performance. Hart (1995) recommends three strategies for companies to achieve performance. The first strategy is the pollution prevention strategy where it helps companies reduce operational cost by reducing emissions and improve other operations. The second strategy is product stewardship where it helps companies gain a competitive advantage financially by reducing life-cycle cost through supply chain integration. The third strategy is sustainable development to position the organisation as one of the industry leaders by minimising environmental hazards through a shared vision with other players in the sector.

Although NRBV theory explains how organisations can retain competitive advantage and performance by implementing environmental management, the knowledge extension is one-sided. It fails to differentiate itself from RBV theory and the idea of resource commitment explained by NRBV theory. The limitations can be presented through the work of Hart (1995), where the three strategies had been specifically mentioned. Thus, scholars have been investigating the performance of companies through the lenses of these three strategies. Whilst pollution prevention and product stewardship are more specific, the sustainable development strategy is used by scholars to include other critical environmental practices that are specific to the industry or context of research, such as supply chain and operations (McDougall *et al.*, 2019). However, this paper revamped all three strategies by linking pollution prevention strategy to resource commitment, product stewardship and sustainable development strategies to circular economy RL product return and product recovery. To better understand the linkage, Figure 1 shows the theoretical framework that this study proposes for automotive companies to achieve financial performance:

Figure 1 shows that automotive companies can achieve financial performance when sustainable resource commitment is being practised. Sustainable resource commitment allows companies to achieve financial performance when companies allocate resources efficiently and commit resources to retain competitive advantage. On the other hand, the CERL is divided based on RL practices of product return and product recovery that add resources back to the companies' supply chain. When RL practices are combined with the circular economy concept, it prolongs the life cycle by limiting wastage of resources such as materials, products and wastage to reduce cost and achieve better financial performance. In addition, companies' sustainable resource commitment practice will further be improved when CERL is practiced as resources, stays in the life cycle longer and when wastage is reduced. As a result, companies can allocate resources efficiently and use resources to strengthen the company's position in the industry.

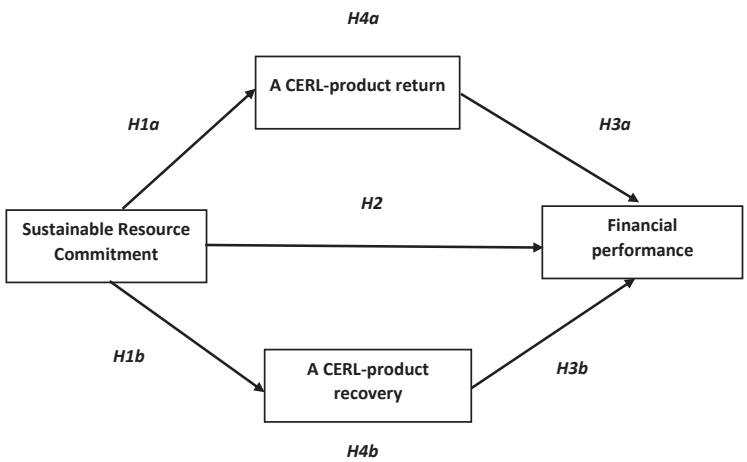

Figure 1.
Theoretical model

3. Literature review and hypothesis development

3.1 Financial performance

The critical criterion for business strategy is financial sustainability. Financial performance is the tangible outcome that maximises sales, improves profits/rising production costs and improves equity contribution and cash flow. Within the literature, revenue generated by the company's profits includes the sale of goods, or dividends, together with the sale of properties. In comparison, returns on equity combine the shareholder's net profit and cash flow that represents the transfer of equities to or from a company over a specified period. To study how financial performance is affected, scholars have considered disposal cost, reseller income, recovery of goods returned, cost of returned products and RL inventory storage and carrying expenditure in their previous studies (Maiti *et al.*, 2020).

3.2 Sustainable resource commitment

Resource commitment focusses on managing and recovering essential resources (Liu *et al.*, 2020). The contribution to resource management can be split into multiple clusters. The first cluster consists of knowledge-based resources, whilst the second cluster consists of property-based resources (Kitano, 2020). Knowledge in inventory information (Fernando *et al.*, 2020), technology and expert human intelligence on resource utilisation are vital inputs for organisational change (Mousa and Othman, 2020).

As per the RBV theory, Fernando *et al.* (2019) found that greater attention to resources improves resource commitment. Due to limited access to natural resources, companies should be highly committed to manage the resources efficiently and handle CERL-product return and recovery accordingly (Mahindroo *et al.*, 2018). Consequently, it will contribute to the firms' financial performance. Sustainable resource commitment can help companies to reduce emissions and pollution when companies manage the resources efficiently. Hart (1995) suggested that companies practice quality improvement in the supply chain and operations to achieve sustainability goals. However, continuous improvement in the supply chain and operations alone is insufficient, as companies need to sustainably manage their resources. Therefore, it can be hypothesised as follows:

H1a. Sustainable resource commitment has a positive and significant effect on a CERL-product return.

H1b. Sustainable resource commitment has a positive and significant effect on a CERL-product recovery.

H2. Sustainable resource commitment has a positive and significant effect on a company's financial performance.

3.3 Reverse logistics – a cornerstone for sustainable supply chain management

RL can be characterised as an excellent production, implementation and monitoring process that enables the cost-effective flow of raw materials, ongoing inventory and semi-finished goods from the customer to the point of origin (Rogers and Tibben-Lembke, 1999). As a result, additional value or appropriate waste disposal is made easy and required inventory for the consequent cycle is replenished (Fernando and Saththasivam, 2017). RL aims to revive interest to increase economic output and increase customer revenues and market share (Guarnieri *et al.*, 2020).

Companies circumvent profit margin angles and align logistics in their supply chains for reduced energy usage and lower emissions under financial, socio-economic, legal and political pressures (Hopkins, 2012). Eco-friendly consumers favour brands engaged in sustainable RL activities that contribute to profitability and efficient usage of assets to meet existing requirements for mitigating environmental impacts (Marić and Opazo-Basáez, 2019). The balance between cost savings and environmental conservation has become a productive effort to boost the sustainable competitiveness of firms (Ngu *et al.*, 2020).

RL also provides economic benefits in terms of less raw material procurement, inventory control and landfill by setting strategic locations for collection centres, reprocessing centres, remanufacturing and transportation (Ali *et al.*, 2020). RL is becoming a critical strategic differentiator amongst organisations promoting cleaner production (Dutta *et al.*, 2021). However, several firms face difficulties to add the recovered used goods into their current forward logistics networks. In this situation, a modern, sustainable RL supply chain network needs to be redesigned by reconstructing existing infrastructure integrated processing facilities (Gao and Cao, 2020). The CERL concept proposed in this paper directly supports these interventions.

3.4 Circular economy

The synthesis of circular economy and RL has importance in constructing social and economic value. Manufacturing sectors tend to pursue eco-friendly production and consumption of goods (Guarnieri *et al.*, 2020). Companies now aim to facilitate the development and recycling of a versatile circular supply chain to reduce waste and positively impact the whole business model (Campos *et al.*, 2017). The circular economy enables this type of business activity (Makarova *et al.*, 2018). However, business disruptions and government policies often affect the model's performance (Shen *et al.*, 2020).

Resource scarcity is thoroughly addressed by the industry. On that note, a CERL-based model is conceptualised in this paper that provides insights for businesses to adopt sustainability-oriented activities that can guide them to utilise the circularity of materials and manage resources efficiently. It will assist the company in reducing unnecessary costs, pollution and initiate sustainable business green growth. The concept of CERL comes from two essential notions of circular economy and RL. The circular economy and RL are different but support each other. Therefore, the circular economy can contribute to sustainable development by applying RL models related to waste recycling, value creation and customer loyalty (Dev *et al.*, 2020). The details of the discussion are as follows:

3.5 Circular economy-based reverse logistics

The CERL is extended to the current circular economy literature based on several criteria. The first criteria shall fit well to improve the business sustainability that focusses more on supply chain operations. The second criterion combines the complex sustainability concepts such as closed-loop supply chain and RL. The third criterion, the CERL, needs to offer better values and practical solutions to achieve sustainable competitive advantage. One of the realised ideas of sustainability incorporated in a business is RL. RL involves the management of product return and product recovery. The domains of CERL will be further discussed in the next section of this paper. Given that as justification, the circular economy's definition is still new, and scholars have called to improve the notion of circular economy (Pieroni *et al.*, 2021).

The CERL has conceptualised the circular economy's features, including an increased life cycle, RL and a closed-loop supply chain (Figure 2). The life cycle stops at the end of the product's life, but a closed-loop supply chain will prolong the product or materials in the life cycle. At the same time, RL focusses on processing those products or materials for reintroduction in the supply chain or secondary market.

Figure 2 shows the business life cycle of a supply chain network. Nowadays, supply chain network capability is the primary criterion of comparison. Thus, Figure 2 shows the company's complete supply chain process from the supplier to the end-user. Figure 2 shows the responsibility of each supply chain process. For example, the supply process involves acquiring energy and raw material, whilst manufacturing involves designing a product and determining the production process. The distribution process involves storing products in a warehouse, monitoring product movement and the supply chain network. The logistics process is about transporting the product to the end-user.

Disposal is not a supply chain process but an outcome of product usage. If a product can be reintroduced to the supply chain, it can be reused, recycled or repaired, whilst the unusable products will be disposed of as waste. RL also enables the reintroduction of waste and creates a secondary market where companies can resell useable products. Even converted wastes

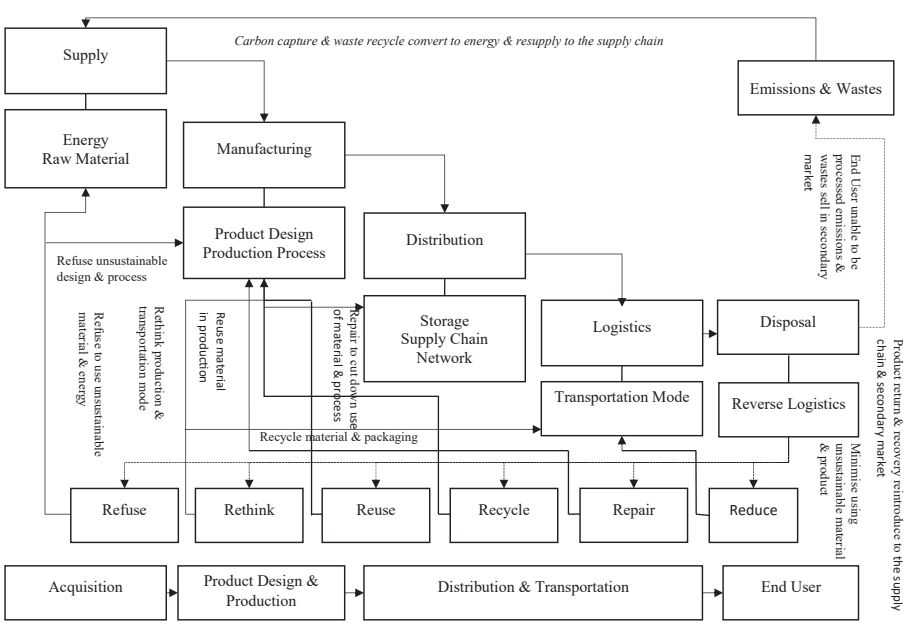

Figure 2.
Circular economy RL framework

and emissions captured through technology can be resold in another market to provide additional income. Companies can rethink their process, product design and product and eventually cut down resources in few production processes. Therefore, combining the features of a business life cycle, closed-loop supply chain and RL can improve companies' sustainable performance.

The domains of CERL are as follows:

3.5.1 CERL-product return. Product returns are detrimental financial strategies in customer sales. Most businesses project uncertain values based on product return fees and transportation charges. Product returns can lead to a loss in revenue for the company if the product is not accurately transported from the customer to the manufacturer. Hence, a company's profits and environmental efficiency can be increased through a controlled return cycle (Zaid *et al.*, 2018) and operational performance (Fernando and Tew, 2016). Effective product returns protocols are strongly related to the concept of a circular economy that brings financial profits. This theory is in line with the NRBV principle, as the company's expertise would directly contribute to improving financial performance and competitive advantage (Baah *et al.*, 2021).

According to NRBV theory, companies need to prolong the product life cycle and reuse materials to reduce cost. Therefore, it needs proper adoption of CERL – product return to manage and remanufacture the recycled materials for more value-added products. The companies need to design an adequate product return mechanism that makes a smooth sailing effort of repair and reuse with system integration. It will bring back the recovered product or material and save resources into the supply chain processes. This paper argued that a properly managed CERL – product return would benefit the company financially. Our argument aligns with Fernando *et al.* (2018) that managing product return can impact resources efficiency and financial performance. Therefore, managing product returns has a direct impact on the company's competitiveness. It is also aligned with NRBV, especially in articulating sustainable development and product stewardship strategies in environmental oriented supply chains.

NRBV has postulated that the company will gain a sustainable competitive advantage when resources are shared amongst supply chain networks to handle product returns using technology partnerships. However, it will be hard to copy the company strategy when it has integrated internal capabilities with external support from the suppliers and business partners. This justification underlies the application of product return management in the supply chain. The company needs to be committed and willing to support the efficient product return that involved sustainable internal and external resources. The stringent ELVs policy amongst the global automotive industry has driven the company to commit and optimise the sustainable resources to handle recycling and remanufacturing. Using mediating variables, Mao *et al.* (2016) argued that the supportive attitude of the company could be observed from the allocation level of resource commitment.

Despite the resource commitment found as a critical construct in RL, the variations in the commitment and willingness to allocate the resource across organisations and industries have inconsistent impacts on the performance (Mahindroo *et al.*, 2018). According to Fernando *et al.* (2021a, b), incorporating RBV and circular economy principles into the research model can improve the impact of environmental innovation on recycled product performance. Daugherty *et al.* (2005) argued that little guidance was provided on RL resource allocation. The inconsistent findings and various levels of commitment in handling product return in sustainable manners will, directly and indirectly, impact the total cost supply chain. The NRBV does not satisfactorily explain the guideline allocation of resources sharing. We argue that sustainable resource commitment is essential to drive efficient product returns and avoid fraudulent returns. The commitment to efficient resource utilisation can strengthen the relationship between the product return process and financial performance.

The company's commitment to allocate the resources for recovery operations in reuse and remanufacturing return products can impact financial gain. The effectiveness of product return can improve the company's commitment to allocate more resources to enhance financial performance. This study argues that effective product return management as an intervening variable can improve company commitment to using the resource wisely, which lead to financial gain. Sustainable resource commitment can drive innovativeness, cost reduction and firm longevity. In this regard, the study contends that the company can improve their commitment to utilise sustainable resources through CERL-product return and recovery procedures. Therefore, it can be hypothesised that:

H3a. A CERL-product return has a positive and significant effect on the company's financial performance.

H4a. A CERL-product return mediates the relationship between sustainable resource commitment and the company's financial performance.

3.5.2 CERL-product recovery. In congruence with the rising environmental problems and related costs (Fernando *et al.*, 2017), the Government stresses the manufacturing sector to recover and reuse materials, especially those at the end of their life span. It is made possible by the industrial revolution and technology development (Govindan and Soleimani, 2017). Restoration of products also extends the product life cycle by saving money and capital (Chen *et al.*, 2017). Product recovery services may be described as the manufacturing process flow dedicated to recovering redundant components, parts and products (Thierry *et al.*, 1995). Thus, product recovery is aimed at increasing environmental values and reducing waste.

Six recovery methods are used, including reuse, repair, refurbishment, renovation, retrofitting and commercialisation (Vijayaraghavan *et al.*, 2013). Recycling is the best way of recovering the product by acquiring and reselling redundant components, parts or products for use on the market (Fernando *et al.*, 2017). Recovery activities have the potential to significantly enhance financial performance (Garg *et al.*, 2015). Product recovery-related constructs are the lifeline of a circular business model. Based on the concept of NRBV, a CERL-product recovery will strengthen the relationship between the company's commitment to using green-based resources and financial performance. NRBV theory posits that a CERL-product recovery is in line with sustainable development and product stewardship strategies. This understanding comes from how companies manage the sustainable resource and less dependency on natural resources. CERL-product recovery will assist the company in keeping the scrap and undamaged materials within the closed-loop supply chain. The product recovery needs to be designed as part of a business strategy compatible with supply chain networks.

The company can improve its financial performance when integrating the CERL–product recovery through supply chain networks. In addition, the company has committed to using environmental-friendly materials and resources obtained efficiently through CERL-product recovery can impact the financial outcomes. It will save more cost and turn waste into valuable products. Li (2014) found that resource commitment has positively mediated the linkage between environmental innovation practices and financial performance.

The CERL drives the company commitment to utilise sustainable resources for competitiveness. This study argues that a company's internal capability can be improved if the company has committed to sustainable resources in the supply chain for operational efficiency. It is argued that RL is hard to achieve when the company is unwilling to utilise sustainable resources. The company needs to commit and modify their supply chain processes to achieve profitability (Fernando and Tew, 2016). Companies can gain and maintain a competitive advantage when successful collaboration exists amongst business networks.

The product recovery process is complex and fraught with difficulties. The company's commitment to allocating resources is a critical enabler of successful product recovery. Company performance can be determined by co-creating value with adequate collaborative resources (Sinkovics *et al.*, 2018). To ensure that the product recovery quality is comparable to that of new products, companies must expend significant effort and resources, particularly in the areas of cannibalisation, repair, refurbishment and remanufacture product return (Zhao *et al.*, 2021). Unfortunately, the product return and recovery process continue to be a critical issue affecting financial performance (Ambilkar *et al.*, 2021). Sinkovics *et al.* (2018) found that RBV-based competency mediated RL commitment, innovative abilities and manufacturer performance. However, to the best of our knowledge, there is little evidence in the literature on how resource commitment can improve the relationship between product recovery and financial performance. It is argued that managing a sustainable resource plays a mediating role in fostering a positive effect on product recovery efficiency and financial outcomes.

This paper argued that a company would regain the lost value of scrap when the product recovery was successfully conducted. The company will enhance its commitment to using sustainable resources and be less dependent on natural resources when the financial performance improves. However, if it is not adequately managed, the reuse of materials for product recovery has its own risk, like a product that breaks quickly and impacts its brand image. Typically, the company is unwilling to commit when the sustainable efforts do not affect the financial return. The mediating effect of product recovery will enhance the company committed to utilising the CERL methods of sustainable resources to improve financial performance. Therefore, it can be hypothesised that if the product recovery helps companies to obtain resources efficiently, it improves resource commitment:

H3b. A CERL-product recovery has a positive and significant effect on financial performance.

H4b. A CERL-product recovery mediates the relationship between sustainable resource commitment and the company's financial performance.

4. Methods

This study adopted a cross-sectional and survey method that was applicable for the required analysis. In this study, the target population was the companies directly or indirectly involved in the Malaysian automotive supply chain. The study sample was taken from the MATRADE (2020). Specifically, the sample frame was from the automotive parts and components section of the database. A total of 616 companies that were identified seemed relevant for this study. Malaysian automotive companies were chosen as a sample due to the ability to comply with environmental management standard (ISO 14001:2015).

For the selected sample, the research unit was the organisation. The selected respondents held management roles in each organisation with sufficient expertise and information to serve their respective companies. In addition, they were selected for their knowledge in implementing RL practices such as inventory recovery, returns, merchandising approval and international certification (ISO standards). This study uses a stratified sampling approach since the characteristics of the population were heterogeneous.

Some efforts have been conducted to control the risk of biases. The data collection was conducted within three weeks with anonymous feedback from respondents. The cut-off duration between early responses in the survey is a week and the rest were considered late. There is no mean value difference between early and late responses in the survey (p-value > 0.05) based on non-response bias results (Table 1). The measurement indicators for the survey have been adapted from existing scholarly work (Table 2). It ensures that the content

is accurate, reliable and correctly structured to avoid inaccurate documentation of responses. The measurement relating to the financial performance was adapted from Lai *et al.* (2013), whilst resource commitment-based measurement items have been adapted from Richey *et al.* (2014).

Variable	Mean (SD) G1	Mean (SD) G2	Std error mean G1	Std error mean G2	*p*-value (remarks)	HTMT FP	HTMT PR	HTMT PRT	HTMT RC
FP	3.895 (0.485)	4.113 (0.364)	0.101	0.038	0.183 (NS)				
PR	3.895 (0.478)	4.097 (0.398)	0.099	0.041	0.372 (NS)	0.640			
PRT	3.891 (0.464)	4.094 (0.369)	0.096	0.038	0.236 (NS)	0.712	0.837		
RC	3.884 (0.477)	4.044 (0.538)	0.099	0.056	0.810 (NS)	0.561	0.479	0.668	

Note(s): *G*1 = early response ($n = 23$); *G2* = late response ($n = 90$); SD = Std deviation; *p*-value: >0.50; NS = not significant; HTMT <0.85; RC = resource commitment; PRT = product return; PR = product recovery and FP = financial performance

Table 1. Non-response bias results and discriminant validity: heterotrait-monotrait ratio (HTMT)

Construct	Item	Indicator	Loadings	CR	AVE
Financial performance	FP1	Decrease of disposal costs	0.776	0.917	0.688
	FP2	Increase of revenue from the resale	0.830		
	FP3	Effective in handling recovery of assets related to our returned products	0.859		
	FP4	Effective in handling cost containment related to our returned products	0.839		
	FP5	Reduction of inventory investment	0.842		
Product recovery	PR1	Our company designs the product to be easy to recycle	0.831	0.919	0.696
	PR2	Our company establishes recycling procedures	0.810		
	PR3	Our company establishes appropriate procedures for dangerous or contaminated materials at the end of the product's life cycle	0.914		
	PR4	Our company uses biodegradable content materials for packaging	0.718		
	PR5	Our company reuses materials from used products or components	0.885		
Product return	PRT1	Collects back used products from customers for recycling, reclamation of materials or reuse	0.744	0.917	0.650
	PRT2	Collects back used packaging from customers for reuse or recycling	0.816		
	PRT3	Requires suppliers to collect back their packaging materials	0.778		
	PRT4	Returns its products to suppliers for recycling, retaining of materials or remanufacturing	0.865		
	PRT5	Returns its packaging to suppliers for reuse or recycling	0.849		
	PRT6	Returns the products from customers for a safe refill	0.778		
Resource commitment	RC1	Level of technological resource commitment to reverse logistics within your company	0.823	0.900	0.751
	RC2	Level of managerial resource commitment to reverse logistics within your company	0.896		
	RC3	Level of financial resource commitment to reverse logistics within your company	0.879		

Table 2. Convergent validity of measurement indicators

On the other hand, measurement items for RL were adapted from Fernando and Tew (2016). The initial survey was pre-tested with ten manufacturers from the automobile industry. This is to ensure that respondents did not have difficulties in understanding any of the question items. Furthermore, their opinions were not included in the final data collection to avoid any bias. IBM SPSS version 25 and partial least squares structural equation modeling (PLS-SEM) version 3.3.7 have been applied to data processing once the data have been collected.

4.1 Database

A set of 616 questionnaires was propagated through an Internet-based survey based on the list of organisations listed in the repositories. Of the total of 616 questionnaires issued, 113 were returned, for an 18.34% response rate. Many factors affected this response rate, including the respondents were busy with the coronavirus disease-2019 (COVID-19) recovery stage. The survey was distributed through the Internet, which usually has a lower-response rate than hand-delivered instruments. None of the survey questions was unfinished, as the electronic survey has an option to make all questions mandatory to be answered before the respondent can proceed to the next section. Out of the 113 companies that replied, 47.8% (54 companies) were foreign-owned multinational corporations (MNCs). The size of the organisation was determined by the number of employees in the company. Large corporations (500 employees) constituted the largest category of respondents with 67 companies (59.3%). The response rate and the balance distributed in this survey show that this study can represent the Malaysian automotive industry and provide empirical evidence of CERL in Malaysia.

4.2 Variables and method of analysis

Even though respondents' acceptable response rate and demographic profile were achieved, the empirical data must comply with the goodness of measures to prove that the data are valid and reliable. The validity and reliability of data are essential to ensure that the finding aligns with the existing theory. Reliability and convergence validity tests were performed through statistical software SmartPLS version 3.3.3. The reliability indicators to prove that the data are reliable and valid are the composite reliability (CR) value, factor loadings value and average variance value extracted (AVE). Hair *et al.* (2019) postulated that the cut-off value of CR should be above 0.7.

Thus, the acceptable cut-off value ensures that the data has achieved 70% or more reliability value. Hair *et al.* (2019) proposed that the cut-off value for factor loading and AVE are above 0.5 or should achieve more than 50% reliability and validity thresholds. Table 2 shows the construct AVE and CR values that are more than the cut-off value whilst the factor loading values for each indicator exceed 0.5 cut-off value.

As a result, the data have been shown to meet the convergence validity criteria. Other than convergence validity, the data have to be tested for discriminant validity. Discriminant validity will prove that the measurement indicators were distinguished in each construct. Hair *et al.* (2019) recommended heterotrait-monotrait (HTMT) criterion as a test of discriminatory validity. The discriminant validity has examined the consistency of solid connection between reflective construct and its indicators in variance-based structural equations modelling (Hair *et al.*, 2022). Henseler *et al.* (2015) postulated that HTMT is a robust test to examine the discriminant validity in composite and factor-based modelling.

The model value was below 0.85, and the discriminatory validity of the two reflective structures was calculated as the results were consistent with Henseler *et al.*'s (2014) rule of thumb (Table 1). Although the correlation between product return and product recovery is high (HTMT: 0.837), our results show that the ratio of correlations criterion between product return and product recovery is within the acceptable cut-off value (HTMT: 0.85). The results

suggest that the variables comprehended and distinguished each research construct. It is argued that there is not enough evidence to conclude that the correlation across latent constructs and indicators is too high and not distinguishable. As a result, we can conclude that discriminant validity has been established.

5. Results

5.1 Hypothesis testing

This paper has proposed hypotheses based on a theoretical framework (Figure 1). Based on the Malaysian perspective, the findings of these hypotheses are shown in Table 3. Hypothesis H1a suggests that sustainable resource commitment will have a positive and significant impact on CERL-product return. The H1a results showed that the path was significant at $p < 0.001$ (β-path coefficient = 0.764 and t-value = 10.592). As a result, H1a was accepted.

H1b expected that sustainable resource commitment has a positive and significant effect on the CERL-product recovery. The tests showed that H1b was statistically significant at $p < 0.001$ (β-path coefficient = 0.600 and t-value = 8.342). Hypothesis H2 stated that sustainable resource commitment has a positive and significant relationship to financial performance. However, the finding shown in H2 was statistically negligible at $p > 0.050$ (β-path coefficient = 0.055 and t-value = 1.308); thus, the H2 hypothesis was rejected.

H3a suggested that CERL return on the product would positively and significantly relate to financial performance. The result showed that H3a was statistically significant at $p < 0.001$ and positively related (β-path coefficient = 0.729 and t-value = 10.271). Thus, the H3a hypothesis was approved. Hypothesis H3b indicated that CERL-product recovery has a positive and significant relationship to financial performance. The analysis revealed that H3b was statistically significant at $p < 0.001$, and the recovery of the product was strongly and positively related to financial performance (β-path coefficient = 0.431 and t-value = 6.519). Hypothesis H3a was then accepted.

Table 3 examined CERL-product return and recovery variables' mediating effect for statistical significance at $p < 0.001$. H4a was established as the CERL-product's return substantially mediates the path from sustainable resource commitment to financial performance (β-path coefficient = 0.557 and t-value = 7.276). Additionally, H4b of CERL-product recovery was accepted as a mediating variable between sustainable resource commitment and its financial performance as the t-value was 2.781 and 0.140 for the β-path coefficient. The R^2 value is analysed to determine the scale of the effect (f^2). The R^2 value for financial results is 0.925, the product recovery is 0.584 and the product return is 0.360.

The R^2 value shows that the sustainable resource commitment construct explained 92% of companies' financial performance whilst achieving 58 and 36%, respectively, for CERL-product recovery and CERL-product return. Thus, there was sufficient evidence that the hypotheses developed represented companies' sustainable resource commitment towards financial performance, CERL-product recovery and CERL-product return.

Furthermore, this paper also reported the effect size of the R^2. Whilst R^2 explained the effect of independent variables on explaining the dependent variable, f^2 on the other hand, measured the strength of the relationship provided by R^2. This study followed Cohen (1988) guideline on the size of the effect. The results showed that the effect size values (f^2) were sufficient to support the hypotheses strength. Table 3 demonstrates the predictive relevance (Q^2) of the structural model using the blindfolding technique. The Q^2 analysis was provided by SmartPLS statistical software to determine the relevancy of the proposed theoretical framework. According to Hair *et al.* (2019), the cut-off value of Q^2 is predicted to exceed zero. The cut-off value was found to be more than zero. Therefore, the results suggest that all three predictive relevance values provide ample evidence to claim that the model has adequate predictive relevance.

Table 3.
Summary of hypotheses testing of initial PLS path model

Hypothesis	Path	β	SE	T-value	p-value	Effect Size, f^2	R^2	Q^2	Confidence interval bias corrected	
H1a	RC → PR	0.764	0.072	10.592	$p < 0.001$	0.404	0.584	0.391	0.004	0.137
H1b	RC → PRT	0.600	0.072	8.342	$p < 0.001$	0.363	0.360	0.211	0.042	0.882
H2	RC → FP	0.055	0.042	1.308	0.182		0.925	0.604	0.139	0.355
H3a	PR → FP	0.729	0.071	10.271	$p < 0.001$	0.392			0.054	0.295
H3b	PRT → FP	0.233	0.068	3.413	$p < 0.001$	0.030			0.597	0.824
H4a	RC → PR → FP	0.557	0.077	7.276	$p < 0.001$	0.047			0.419	0.670
H4b	RC → PRT → FP	0.140	0.050	2.781	$p < 0.001$	0.037			0.072	0.230

Note(s): RC = resource commitment; PRT = product return; PR = product recovery and FP = financial performance

5.2 Importance-performance map analysis

This study was guided by Ringle and Sarstedt (2016) in examining the output level of latent and dependant variables in the PLS-SEM review. IPMA is useful for corporate decisions, as it offers a deeper understanding of market domain prioritisation. This is because IPMA can recognise the most critical practices for improving financial results; both scholars and practitioners can establish business strategies to improve their performance. Table 4 shows that financial performance has a latent variable index value of 4,068 and a score of 69,796 for resource commitment. Table 5 and Figure 3 show the importance-performance of the indicators. The IPMA result could be divided into four quadrants. The top left quadrant is of high importance but low performance, whilst the bottom left quadrant denotes low importance and low performance. On the other hand, the top right quadrant denotes high

	FP	PR	PRT	RC
LV index values	4.068	4.056	4.052	4.017
LV performance	55.917	55.651	54.925	69.796

Note(s): RC = resource commitment; PRT = product return; PR = product recovery; FP = financial performance and LV = latent variable

Table 4. Latent variable index values and performance of the target construct FP

	PR	PRT	RC
1	0.176 (69.322)	0.047 (68.732)	0.251 (66.962)
2	0.165 (54.425)	0.052 (54.867)	0.336 (68.437)
3	0.191 (53.097)	0.058 (50.885)	0.279 (74.336)
4	0.161 (50.885)	0.046 (52.655)	
5	0.180 (51.77)	0.048 (55.212)	
6		0.038 (51.212)	

Note(s): Values in parentheses are indicators' performance; RC = resource commitment; PRT = product return; PR = product recovery; FP = financial performance

Table 5. Indicators' importance and performance of predictors to the targeted construct

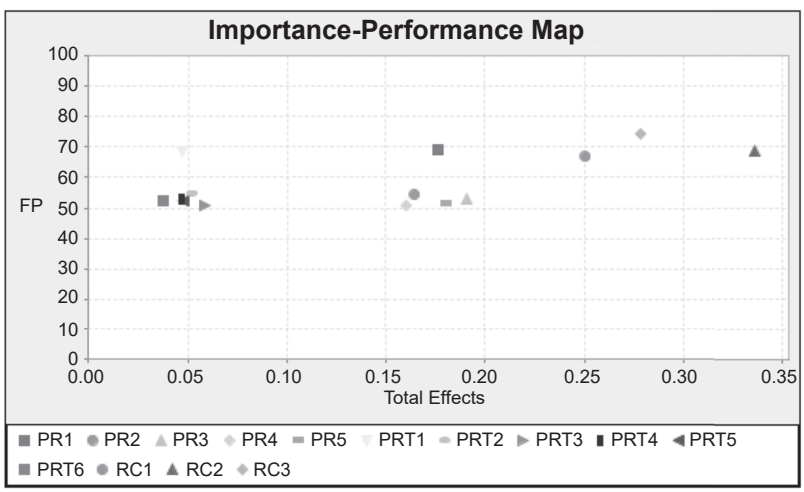

Figure 3. Importance-performance map

importance and high performance, whilst the bottom right quadrant has low importance but high performance. Thus, Figure 3 shows that RCR3 and PR1 have high importance and high performance.

Due to limited access to natural resources, companies should be highly committed to manage the resources efficiently and handle CERL-product return and recovery accordingly (Mahindroo *et al.*, 2018).

6. Discussion

The impact of a sustainable resource commitment on CERL has been significant in achieving financial performance. Using CERL, automotive companies can optimise the use of materials by restoration activities and meet the environmental objectives. In addition, resource commitment can drive efficient and productive product return and recovery management. This study showed that CERL has a significant impact on financial performance (Saxena *et al.*, 2018). The finding further suggests that the automotive industry can increase its financial performance by investing further in remanufacturing, refurbishment or recycling, creating new opportunities and niche markets maintaining the same environmental quality standards (Fernando *et al.*, 2018).

Furthermore, this study found that the greater the resource commitment, the greater are the financial performance. Our finding is in line with Mahindroo *et al.* (2018). On the other hand, our result found not enough evidence to prove that resource commitment directly affects financial performance. The finding is in contrast with Sinkovics *et al.* (2018). Overall, our results show that the circular economy helps businesses improve efficiency, especially with RL. Hence, the proposed theoretical model is embraced with the use of CERL. In regard to mediating role in the research model, we found that sustainable resource commitment has mediated the relationship between CERL and financial performance. Our findings are consistent with those of Daugherty *et al.* (2005).

The CERL concept proposed in this study would help gain insights into the process management of market players and help design supply chains of great value achieved through waste reduction (Marić and Opazo-Basáez, 2019). Awareness of the circular economy has also seen a rising trend amongst the industry. However, given the significant changes in our natural habitat and ecosystems, stakeholders and government bodies should expand their operations to include circular economy-based concepts that target the right infrastructure, services, and skills in logistics, procurement, distribution and training. The Malaysian automotive sector and related public bodies and stakeholders should derive insights from these ideas and put them into practice. This study opens several pathways with the help of the proposed CERL model.

7. Implications

Nowadays, it is challenging to retain competitive advantage or consistently achieve performance when environmental and technological advancements are the centre of attention in the current business environment. Therefore, we discussed both the theoretical and practical implications of our findings separately.

7.1 Theoretical implications

This study has also expanded NRBV theory to improve financial sustainability with a commitment to internal resources. The circularity concept in RL has led to an increase a strategic advantage for the automobile industry. In other words, a company should optimise the use of resources for sustainable growth. The adoption of the CERL program, in particular, reduces energy use, scraps and raw material used in the automotive industry and indirectly

improves the overall environment efficiency, which benefits all stakeholders. Work using NRBV theory shows that it is possible to extend the theory since NRBV states that sustainable resource commitment and sustainability practices can improve financial performance.

7.2 Practical implications

The dynamic market, especially in the automotive industry, means that companies concentrating on assets without stressing the value of environmental concerns have no competitive edge. From the company's point of view, additional revenue would be created if CERL activities were to meet the requirements to accomplish the social responsibilities. Government officials should use a win–win of CE to build and manage a more green and sleek production market that promotes political legislation (Korhonen *et al.*, 2018). Resource and production based on waste management and life-cycle policies can be framed according to demographic parameters. Even though current policies depend too heavily on government subsidies, they should benefit from production and market governance (Zhu *et al.*, 2019).

Industrial wastes, especially in developed countries, are severely controlled. New options for controlling demand have been created for zero-waste initiatives to eliminate waste creation and manage trash (Das *et al.*, 2019). This study portrays thoughtful, practical implications from which policymakers and government organisations can derive insights, especially in governing the automotive sector. Therefore, the CERL model proposed by the product return and recovery protocol positively and significantly affects the company's financial performance and significantly mediates the relationship between sustainable resource commitment and its financial performance.

8. Conclusion

To conclude, most companies' financial performance is affected by economic downturns, but RL offers a solution by generating additional revenues to support the company. This is the benefit of the inclusion of a circular economy and its processes that can create value. Therefore, the circular economy permits the development of the circular supply chain and is responsible for environmentally friendly practices. During the economic recession and COVID-19 pandemic, the operations of automobile manufacturing companies are reduced because of lower demand or technological disruption due to lower competition for replaced parts or components.

In this case, better understanding and proper management on how to use existing infrastructure, machinery and equipment to increase production through the use of RL or to extend business lines to a specific segment of the market, such as the resale to the secondary market of used replacement parts and components, would surely allow a company to cope with any downturns. A closer look into other returns and recovery management approaches that are related to remanufacturing in the automotive industry is required. The study only deals with the global product return and recovery in the automotive sector. In future research, this CERL model as proposed has good scope to be explored in automation systems and new sustainable metrics of sustainable supply chains. Further work on the development of strategic circular business models based on concepts of circular economy and Industry 4.0 should be undertaken swiftly. The company is suggested to adopt Blockchain technology to monitor the traceability of carbon emission and integrity of green practices in the supply chain (Fernando *et al.*, 2021a, b). Value creation through a circular economy that runs through all directions into a winning business model should be tested empirically in all business sectors.

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The relationship between board characteristics and social responsibility with firm innovation

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Abstract

Purpose – The present study aims to assess the potential impacts of board members' characteristics, including connectedness and independence, on the level of the firm's involvement in innovation and corporate social responsibility (CSR).

Design/methodology/approach – Variables of board members' interlock and independence are selected for measuring the board characteristics and their association with innovation. The range of disclosure of social responsibility (SR) of the firms inside and outside the industries is also analyzed through descriptive-correlational. The selected sample includes 280 firm-years listed firms on Iraq Stock Exchange during 2012–2017 and 1,026 firm-years on the Tehran Stock Exchange. The hypotheses are examined using multivariate regression models and panel data.

Findings – The observations show that board interlock and independence in both countries are willing to improve firms' innovation. Moreover, having controlled the industry index, the authors find that business environment innovation is willing to be transmitted into the firms through outside industry sources in Iran. In the Iraq country, regardless of industry index, the positive association between interlocked boards and firm innovation is established. Further analyses also articulate that board interlock is not considered a mechanism to transmit information and experiences about CSR activities.

Originality/value – This paper is a pioneer study to assess the relationship between board member characteristics and the firms' innovation and SR both in Iran and Iraq. Also, it extends the literature by considering the industry index as a significant source of knowledge and experience to gain more precise results. Therefore, the current paper may contribute to the development of knowledge in this field of study.

Keywords Board interlock, Board independence, Firm innovation, Social responsibility

Paper type Research paper

1. Introduction

The only survival way for organizations in today's turbulent environment is to get along with environmental changes. Innovation for embracing changes and sometimes modifying changes is a useful and modern tool for current organizations. The current situation for firms is far more complicated than before, so organizations should be innovative for developing markets, attracting customers and entrepreneurship (Aghion *et al.*, 2013). Innovation is a

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basic factor in creating competition because it would lead to firm growth and future success (Tian and Wang, 2014).

On the one hand, business firms frequently promote innovation in products and processes to survive the competition. In today's competitive world, firms' survival relies on paying special attention to innovation (Seru, 2014). Hsu *et al.* (2014) defines the current business setting as a dynamic platform such that failure in planning and performing innovation would lead to a decrease in firm competitiveness (Atanassov, 2013; Balsmeier *et al.*, 2014), gaining information seems essential for innovation development (Drucker, 1993; Hall *et al.*, 2005).

There is a conflict of interest between managers and owners. Therefore, the presence and establishment of an effective and efficient board of directors would align managers' and owners' interests, enhancing operational performance and firm development (Masulis and Mobbs, 2014). The board of directors' members can be interlocked, simultaneously serving on many boards in different firms. Having an interlocking board of directors might have several knock-on effects proposed by the previous literature. For instance, on the light side, Pfeffer and Salancik (2003) articulate that interlocked directors may transmit additional resources such as legitimacy, skills, information into the firm and provide some worthy links, including customers, suppliers, capital providers and other stakeholders for their companies.

Companies suffering from market pressures may be engaged in corporate social responsibility (CSR) activities to address their activities to society, leading to competitive advantages (Dhaliwal *et al.*, 2011). The director's Interlock characteristic may generate experience for companies in CSR activities and reporting to decline external pressures. Such a measure has led to the boards of directors' demands to voluntarily disclose additional and non-financial information in their annual report in recent decades. To obtain the most efficient results, the board are supposed to check the retrospective and prospective consequences of these reports (Perry and Peyer, 2005; Villiers *et al.*, 2011; Hafsi and Turgut, 2013; Boulouta, 2013).

Considering the above discussions, it is observed that this line of the literature proposes mixed findings related to the knock-on effects of the interlocked board of directors. Therefore, first, the present study attempts to provide a clear picture of the exact consequences of having interlocked directors. Second, one of the pioneer studies assessing the effects of board interlock and independence on the firms' innovation and engagement in social responsibility (SR) activities, especially in emerging economies, including listed firms on Iran and Iraq Stock Exchange. Since the former studies mostly evaluate the other aspects of board interlocks, including resource seeking (Chin-Huat *et al.*, 2003), signaling (Luffarelli and Awaysheh, 2018), monitoring (Carpenter and Westphal, 2001), accessing human capital (Johnson *et al.*, 2011) and social cohesion (Burris, 2005). Thirdly, we discriminate between directors interlocked inside and outside the industry since it is expected that relative information to the domain of a firm's activity must contribute greatly to the firms' performance (Chang *et al.*, 2006; Belenzon and Berkovitz, 2010). Hence, the present study seeks to answer the question of "whether the board interlock and independence can lead to an increase in innovation level and improve the social responsibility in firms or not." Moreover, the comparison between the two countries' findings may contribute to the literature due to different institutional settings governing the business environments.

2. Theoretical principles, literature review and hypothesis development

2.1 An interlock between board members and firm innovation

The analyses of internal and external users of financial statements about the economic consequences of research and development (R&D) costs show there is a significant relationship between R&D costs and future operational efficiency (Drucker, 1993; Hall *et al.*, 2005). The frequent growth and change in markets, the decrease of products' lifecycle, the

necessity for organizational flexibility and such changes give rise to the issue (Tian and Wang, 2014). Hsu *et al.* (2014) declares that the reported profit and loss from adjusted R&D costs indicate such expenditures' resultant interests. Hope *et al.* (2017) conclude that technical innovation, product efficiency, external supervision and managerial motivational plans, due to competition increase, lower China's systematic economic uncertainty.

An interlocking directorate occurs when a director of one firm's board also sits on another company's board. A firm can have one or more directors who sit on the boards of other firms. While firms can also be connected through social ties between directors based on executives' shared educational background or past employment, our data do not allow us to identify such potential connections (Helmers *et al.*, 2017). According to the network theory specifications, it is argued that a firm's network position partially allocates the limitations and opportunities that the firm might face. This may influence strategic alternatives, information processes, corporate risk-taking and sheltering and provision of rare resources (Audretsch and Feldman, 1996; Storper and Venables, 2004). Therefore, the extended network capabilities might help firms have greater access to worthy information that might be considered to improve the firm's performance by operating innovatively (Chuluun *et al.*, 2017) and keeping pace with their competitors (Ahuja, 2000). To the extent that network connection, which may explain the level of innovation, incrementally plays a part as a channel for transmitting and facilitating the flow of skills, expertise, technology, R&D and other similarities (Andersson and Karlsson, 2007; Weterings and Ponds, 2009). Chuluun *et al.* (2017) show that network connectedness's different characteristics affect firm innovation input and output, particularly firms in relatively intangible industries. Helmers *et al.* (2017) find that board interlocks have significant positive effects on both R&D and patenting. Considering the above discussion, we expect that board interlock is likely to transmit knowledge, expert, innovation, etc. into the firms. Thus the first hypothesis is conducted as follow:

H1. Having an interlocked board plays an ameliorating role in firm innovation.

H2. Having an interlocked board within the industry plays an ameliorating role in firm innovation.

H3. Having an interlocked board outside industry plays an ameliorating role in firm innovation.

2.2 Board independence and firm innovation

Board composition can contribute to the financial performance of the firms. If most board members were unbounded managers, the board would be more efficient (Bathula, 2015). If the board members are executive managers, they are less concerned about their primary duty and role in the firm as members of the board, namely supervision on executive managers and controlling them, so this significant role is less evident (Bathula, 2015).

Innovation is a leading factor for empowering firms to create value and preserve competitive advantage in the complicated and ever-changing environment (Fan and Wang, 2012). Hence, decision-makers should understand the significance of innovation and apply that in their organizations. In this regard, Kim and Luo (2017) argue that board independence will create economic added value and innovation. Lu and Wang (2018) document a positive effect of board independence on corporate innovation. One side of the literature argues that independent boards are likely to improve a firm's performance by investing in R&D expenditures.

In contrast, some believe that firms adopting innovative strategies tend to select one or more measures that the customers in the industry recognize as an important item, which makes them posit themselves to respond to these demands for such important measures by producing innovative products (Porter, 1985), employing such a strategy requires companies

to invest heavily in R&D activities (Mia and Clarke, 1999). It also suggests that managers pursue creative and innovative action freely to thrive and succeed in the long run. Therefore, the boards' strict monitoring activities may limit managers from achieving these goals since such restrictions might reduce the manager's ability to make wise decisions vital for the firm's performance in the long run (Robinson and Mcdougall, 2001; Simerly and Li, 2000). As a result, managers are less likely to invest in risky projects, such as R&D investments, which have long-run outcomes (Baysinger and Hoskisson, 1990; Zahra, 1996). Gani and Jermias (2006) confirm that board independence has a more positive effect on performance for firms pursuing a cost-efficiency strategy than innovation. Coles *et al.* (2008) argue that firms with R&D investment must have a large representation of inside directors on their board. These members possess firm-specific knowledge that is crucial for the firm to succeed in a competitive environment.

According to the above discussions, we expect that board independence may improve the firm's innovation through more efficient manager monitoring. In this regard, the fourth hypothesis is conducted as follows:

H4. Having an independent board plays an ameliorating role in firm innovation.

2.3 Board members' interlock and social responsibility growth

Managers tend to show their optimal performance and extensively reflect the news, media and related events. CSR disclosure methods of the firm rely on the effects of economic activities of the society. The type of industry is among the factors that affect the SR disclosure of the firms. For example, in export-oriented industries, international clients' pressure is a significant factor for SR disclosure. To show a favorable picture at the international level, these firms embark on CSR disclosure and not regulating, leading to missing the contracts (Belal and Owen, 2007; Islam and Deegan, 2008).

According to network theory, firms may imitate good (Srinivasan *et al.*, 2018) and bad (Khanna *et al.*, 2015) procedures from other firms in the same board network. One of the firm's motivations to follow CSR activities might fulfill social expectations (Aguilera *et al.*, 2007). Firms usually engage in CSR activities and reporting to alleviate external pressures and prevent social sanctions. One view, which is based on the institutional level, argues that regulations and laws form the firms' social behaviors through mandatory power (Ali *et al.*, 2017; Gallego-Alvarez and Quina-Custodio, 2017). In turn, forcing companies to legitimize their activities based on social requirements and SCR disclosure might be recognized as a reaction to cultural–cognitive and normative impact pressures (Cormier *et al.*, 2005; Rupley *et al.*, 2012). The other view suggests that CSR reporting could help firms protect their reputations for achieving business success (Graafland, 2018), motivating firms to engage in CSR activities (Chih *et al.*, 2010). Therefore, CSR reporting aids firms to gain strategic resources and establish a competitive advantage reduces firms' equity capital cost (Dhaliwal *et al.*, 2011, 2014), provides positive capital among communities and stakeholders related to moralities, improves firms protection and reduces business risks (Luo and Bhattacharya, 2009). And reduce risks from the capital market, such as stock price crash risk (Kim *et al.*, 2014).

Accordingly, interlock boards may help firms in two ways: (1) interlocked directors transmit other firms' experiences in CSR activities and strategies to rectify the external pressures based on a mimetic view; (2) based on the communication mechanism view, they may transmit information, intelligence, knowledge, expertise and skill to issue CSR reports effectively. Therefore, board connectedness is an important mechanism to transfer knowledge in CSR activities and reporting into the firms and may play an allocative role in establishing corporate governance practices (Del Vecchio, 2010). Un *et al.* (2019) find that board interlocks positively affect firms' CSR reporting. According to the above discussions, it

is expected that interlocked boards are more likely to be engaged in CSR activities and reporting. Thus the following set of hypotheses is conducted in this sense.

H5. Having an interlocked board plays an ameliorating role in firm CSR activities.

H6. Having an interlocked board inside the industry plays an ameliorating role in firm CSR activities.

H7. Having an interlocked board outside the industry plays an ameliorating role in firm CSR activities.

2.4 Board independence and social responsibility growth

According to previous findings, board independence may affect CSR activities through improved manager-monitoring quality. Since independent directors are not engaged in the firm's daily activities, they can develop more objective advice. They do not possess financial interests as dependent directors (Coffey and Wang, 1998). Comparing internal and external directors, the former ones who usually consider the short-run financial objectives, the latter show different motivations, such as values and time horizons (Donnelly and Mulcahy, 2008; Post *et al.*, 2011). They are more likely to take a long run horizon and follow stable development (Johnson and Greening, 1999). Thus, it is expected that independent directors take into account CSR activities compared to internal directors since such activities provide long-run benefits. Bahar Moghadam *et al.* (2013) showed that corporate governance mechanisms, except the manager's dual role in the board, positively and significantly associated with CSR. The level of disclosure in the selected firms is low.

As mentioned earlier, unbounded board members supervise executive managers' decisions, and board composition can influence the firms' financial performance. On the other hand, being independent would lead to more reliance on SR, which is likely to create a positive and significant relationship with SR. Huang *et al.* (2016) perceive that increased independence causes quality improvement as a criterion for CSR and decreases presenting auditors' adjusted statements via increasing audit fees. Moreover, Eshleman and Lawson (2016) also show that increasing board independence, CSR and earnings quality will increase. Besides, Rodriguez *et al.* (2017) declare that the main determiner in creating costs is different credits obtained from different firms, although such a measurement may defect. Given the abovementioned fact, the eighth hypothesis is as follows:

H8. Having an independent board plays an ameliorating role in firm CSR activities.

3. Research methodology

Since the present study is conducted for 6 years, it is longitudinal in terms of time horizon. Since the user data are real and historical, it can be classified as a retrospective study. The main reason for choosing such a period is data availability. In this paper, the documentary method is used to collect information. The information of sampling companies was extracted from electronic archives of the Iraqi and the Tehran Stock Exchange's official websites and the Website of the Comprehensive Database of all listed companies. Then, the extracted raw information is prepared in the Excel spreadsheet.

The study's statistical population comprises all listed firms on the Tehran Stock Exchange and Iraq Stock Exchange. The statistical data and information related to listed firms in the statistical sample were collected during 2012–2017 for the Tehran Stock Exchange and Iraq Stock Exchange. Sample companies were selected using the systematic elimination method among the affiliated firms in the statistical population with the following exclusions:

(1) Since the financial and operational structures of banks, financial institutions, investment firms, intermediaries and holdings, are different from manufacturing companies, the mentioned industries are excluded.

(2) They should be active in the Tehran or Iraq Stock Exchange during the period of study; such a restriction is applied to the prevention of missing data and;

(3) The required financial information, especially the annexed notes to the board's financial statements and general assembly annual reports, should extract required data.

It is worth mentioning that by considering the above-said conditions (171*6 = 1,026) and (46*6 = 276), firm-years remained for Tehran Stock Exchange and (46*6 = 276) firm-years for Iraq Stock Exchange, which are indicative of the real statistical population. This study hypothesized that selected firms are a random sample from a time interval, so the results are generalizable to similar Stock Exchange markets. Finally, an unbalanced panel data is employed in this study to analyze the data.

3.1 Fitted patterns for hypothesis testing and variables of the study

In this paper, multivariate regression models are used to analyze the research parameters as follows:

3.1.1 Model 1 (First, second and third hypothesis testing). To assess the impact of boards interlock on the firm innovation, the variables including $\beta_1 \text{Interlocks}_{it}$, general measurement of interlock feature regardless of industry effect, $\beta_2 \text{Interlocks\_IND}_{it}$, considering the inside industry impact, and $\beta_3 \text{Interlocks\_OutIND}_{it}$, considering the outside industry effect, are employed in the Model 1.

$$\begin{aligned}\text{Innovation}_{it} = {} & \beta_0 + \beta_1 \text{Interlocks}_{it} + \beta_2 \text{Interlocks\_IND}_{it} + \beta_3 \text{Interlocks\_OutIND}_{it} \\ & + \beta_4 \text{Growth}_{it} + \beta_5 \text{INST}_{it} + \beta_6 \text{B\_IND}_{it} + \beta_7 \text{ROA}_{it} + \beta_8 \text{LEV}_{it} + \beta_9 \text{Size}_{it} \\ & + \varepsilon_{it}\end{aligned}$$

3.1.2 Model 2 (Fourth hypothesis testing). To assess the impact of board independence on firm innovation, the variable $\beta_1 \text{INDEP}_{it}$, is employed in Model 2.

$$\begin{aligned}\text{Innovation}_{it} = {} & \beta_0 + \beta_1 \text{INDEP}_{it} + \beta_2 \text{Growth}_{it} + \beta_3 \text{INST}_{it} + \beta_4 \text{B\_IND}_{it} + \beta_5 \text{ROA}_{it} \\ & + \beta_6 \text{LEV}_{it} + \beta_7 \text{Size}_{it} + \varepsilon_{it}\end{aligned}$$

3.1.3 Model 3 (Fifth, sixth and seventh hypothesis testing). To assess the impact of boards interlock on the firm CSR, the variables including $\beta_1 \text{Interlocks}_{it}$, general measurement of interlock feature regardless of industry effect, $\beta_2 \text{Interlocks\_IND}_{it}$, considering the inside industry impact, and $\beta_3 \text{Interlocks\_OutIND}_{it}$, considering the outside industry effect, are employed in the Model 3.

$$\begin{aligned}\Delta\text{CSRD}_{it} = {} & \beta_0 + \beta_1 \text{Interlocks}_{it} + \beta_2 \text{Interlocks\_IND}_{it} + \beta_3 \text{Interlocks\_OutIND}_{it} \\ & + \beta_4 \text{Growth}_{it} + \beta_5 \text{INST}_{it} + \beta_6 \text{B\_IND}_{it} + \beta_7 \text{ROA}_{it} + \beta_8 \text{LEV}_{it} + \beta_9 \text{Size}_{it} + \varepsilon_{it}\end{aligned}$$

3.1.4 Model 4 (Eighth hypothesis testing). To assess the impact of board independence on firm CSR, the variable $\beta_1 \text{INDEP}_{it}$, is employed, which is in Model 4.

$$\Delta \mathrm{CSRD}_{it} = \beta_0 + \beta_1 \mathrm{INDEP}_{it} + \beta_2 \mathrm{Growth}_{it} + \beta_3 \mathrm{INST}_{it} + \beta_4 \mathrm{B\_IND}_{it} + \beta_5 \mathrm{ROA}_{it} + \beta_6 \mathrm{LEV}_{it} + \beta_7 \mathrm{Size}_{it} + \varepsilon_{it}$$

3.2 Dependent variables

The firm's social responsibility growth (ΔCSRD): This is calculated using the social disclosure checklist for each firm in the year *t*. This checklist is designed for decoding qualitative information on the annual reports. SR is in six dimensions: environmental issues, products and services, human resources, customers, society responsibilities and energy. Content analysis of such disclosures is classified in the context of financial statements notes and board reports.

Firm innovation: market value to book value ratio is used to measure innovation in the firms under study.

3.3 Independent variables

Board members' interlock (Interlocks): a virtual variable is used to measure the interlock of board members, equal to one of two firms having a common member on the board; otherwise, it will be zero.

Board members' interlock inside the industry (Interlocks_IND): is 1 if two firms have a common member in the board inside the industry; otherwise, it will be zero.

Board members' interlock outside the industry (Interlocks_OutIND): is 1 if two firms have a common member on the board in two different industries; otherwise, it will be zero.

Board independence (INDEP): this variable is calculated by dividing the number of unbounded members into total members. The board's unbounded member or non-executive manager in the stock companies is a manager who is only responsible for membership in the board and is not physically present in the firm with no executive responsibility. Unbounded managers are only present at the board meeting times, mostly as senior managers' consultants and have no other firm work relationships. Such managers are like lawyers who perform the firm's authorities following the Regulations and Articles of Association.

3.4 Control variables

Firm growth (Growth): This is measured based on the firm's sales changes in proportion to the previous year.

Return on assets (ROA): operational profit to the firm's total assets.

Firm size (Size): natural logarithm of sales of the firm.

Institutional ownership (INST): the percentage of stock held by the insurance firms, financial and investment institutes, banks, state-owned firms and other sections of the state, which is calculated by dividing the number of institutional ownership stocks into total normal stocks of the firm at the beginning of the period.

Operational leverage (LEV): total liabilities of the firm to total firm assets.

Board size (B_IND): number of board members of the firm.

4. Research findings

First, to analyze and better understand the information, some central and data dispersion indices were studied, depicted in Tables 1 and 2. These tables illustrate Iraqi firms' descriptive statistics during six years of study and 35 firms and the Iranian firms' information during this period with 114 firms.

Table 1.
Descriptive statistics of non-indicative variables

	Iranian stock exchange firms						Iraqi stock exchange firms					
Sign	No. obs	Mean	Median	Std. dev	Max	Min	No. obs	Mean	Median	Std. dev	Max	Min
ΔCSRD	1,026	0.153	0.100	0.095	0.305	0.000	276	0.104	0.111	0.085	0.351	0.000
Innovation	1,026	2.551	2.324	3.822	4.081	1.024	276	2.301	2.061	3.625	4.162	1.100
INDEP	1,026	0.451	0.428	0.161	0.888	0.091	276	0.408	0.416	0.139	0.857	0.142
Growth	1,026	0.234	0.249	0.366	1.241	−0.356	276	0.189	0.241	0.359	0.935	−0.287
ROA	1,026	0.123	0.112	0.172	0.639	−0.784	276	0.056	0.058	0.207	0.635	−0.785
size	1,026	13.229	13.320	1.702	18.053	5.940	276	7.156	7.010	1.957	15.09	3.213
INST	1,026	0.241	0.260	0.541	0.950	0.060	276	0.209	0.230	0.497	0.910	0.000
LEV	1,026	0.608	0.634	0.518	0.952	0.187	276	0.629	0.640	0.585	0.922	0.207
B_IND	1,026	5.119	5.000	7.024	11.000	3.000	276	4.527	3.000	5.624	9.000	3.000

	Iranian stock exchange firms			Iraqi stock exchange firms		
Indicators	Interloks	Interloks_IND	Interloks_OutIND	Interloks	Interloks_IND	Interloks_OutIND
Numbers of 1 observations	88	38	50	93	4	88
Numbers of zero observations	955	1,005	993	187	276	192
Total observations	1,043	1,043	1,043	280	280	280
The percentage of 1 to total observations	0.084372	0.036433	0.047939	0.332143	0.014286	0.314286
The percentage of 0 to total observations	0.915628	0.963567	0.952061	0.667857	0.985714	0.685714
Std. dev	0.278078	0.187456	0.213739	0.471825	0.118879	0.465062

As can be seen in the Table, the average SR growth in listed firms on Iraq Stock Exchange is 0.104, which shows, on average, in these firms among the defined indices in the checklist of SR disclosure in each year, about 10% is added to the score of the previous year. In contrast, the average SR growth for listed firms on the Tehran Stock exchange is 0.153, which shows that about 15% is added to the previous year's rank among the related indices each year. The results reveal that recent developments of the industry in Iran and the needs related to managers' responsibility in different groups of stakeholders recently have caused the Iranian firms to be inclined toward more disclosure of SR reporting. Moreover, the innovation of Stock Exchange firms in Iraq and Iran has a mean of 2.301 and 2.551, respectively, indicating higher average innovation in the Iranian firms. On the other hand, the mean board members' interlock in the Iranian and Iraqi firms is 0.181 and 0.104, respectively, which shows board members in the Iranian Stock Exchange firms about 18 and 10% a similar board.

4.1 Linearity test

The variance inflation factor (VIF) test is applied to estimate the linearity problem between explanatory variables. According to the reported statistics in Table 2, as the VIF indices of all variables are less than 10, there is no linearity problem for regression variables. It is noticeable that, according to the VIF test, if the results were more than 10, there would be a linearity problem in the variables.

4.2 Preferential model

This paper employs two-sided F-Limer and Hausman tests to select the most suitable statistical model for hypotheses testing. The obtained results are depicted in Table 3.

4.3 Hypothesis testing

Since panel data are used to test the hypotheses, it is necessary to assess the model fitting tests before model estimation; the results are presented in the tables. The results of hypotheses 1–3 (model 1) for sample firms are depicted in Table 4.

This Table shows that coefficients for the variable (interlocks) in the model for the Iranian and Iraqi firms are equal to 0.921*** and 0.286***, respectively, which shows that there is a significant relationship between this variable and innovation, so the first hypothesis is confirmed for both groups of Iranian and Iraqi firms. Such findings mean that having interlocked directors lead to greater innovation inside the firms. In line with the underlying theory and previous studies, it argues that interlocked directors are supposed to transmit

	Iran		Iraq	
Variable	VIF	1/VIF	VIF	1/VIF
roa	1.09	0.919146	1.6	0.625719
inst	1.09	0.919769	1.19	0.839477
Size	1.08	0.926005	1.09	0.91884
Indep	1.07	0.93534	1.12	0.890845
Growth	1.06	0.947571	1.01	0.989727
Bind	1.04	0.956985	1.17	0.856818
lev	1.04	0.961006	1.53	0.652562
Interlocks	1.01	0.986871	1.08	0.922486
Interlocks-d	1.02	0.983917	1.09	0.920102
Interlocks-t	1.01	0.991297	1.03	0.974199
Mean VIF	1.05		1.19	

Table 2. The results of the variance inflation factor

Table 3.
The results of the statistical method preferential tests

Description	Hausman Statistic	Hausman Prob	F-Limer Statistic	F-Limer Prob	Iran result
Iran preferential model tests					
Model 1	37.95	0.000	5.18	0.000	Panel with fixed effects
Model 2	39.07	0.000	4.60	0.000	Panel with fixed effects
Model 3	6.10	0.6356	22.92	0.000	Panel with random effects (GLS)
Model 4	4.29	0.8916	20.39	0.000	Panel with random effects (GLS)
Iraq preferential model tests					
Model 1	19.94	0.0106	3.72	0.000	Panel with fixed effects
Model 2	400.88	0.000	3.30	0.000	Panel with fixed effects
Model 3	13.19	0.1055	0.88	0.5367	Panel with random effects (GLS)
Model 4	22.72	0.0069	0.81	0.6042	Panel with fixed effects

Table 4.
The results of board interlock on innovation (Model 1)

	Iran				Iraq			
Variables	Obs	Coef	Std. Err	*p*-value	Obs	Coef	Std. Err	*p*-value
Interlocks	1,026	0.921	0.225	0.000	276	0.286	0.025	0.000
Interlocks_IND	1,026	−1.192	0.502	0.017	276	−0.348	0.061	0.000
Interlocks_OutIND	1,026	1.323	0.211	0.000	276	0.216	0.040	0.000
Growth	1,026	0.869	0.401	0.031	276	0.191	0.098	0.051
inst	1,026	−4.879	2.593	0.060	276	0.387	1.083	0.721
Bind	1,026	−2.255	1.694	0.183	276	0.584	0.256	0.005
roa	1,026	2.40872	1.726	0.163	276	1.589	1.427	0.267
Ley	1,026	2.0872	0.767	0.007	276	0.241	0.048	0.000
Size	1,026	2.461	0.598	0.000	276	−1.581	0.544	0.004
_cons	1,026	−17.424	12.02	0.147	276	13.733	12.351	0.983
Coefficient of determination of the model (R^2)		0.2555					0.2055	
F Statistic of the model		5.180					3.720	
The *p*-value of the *F* statistic		0.000					0.0004	

information, knowledge, expert, skill and experiences into the company, which in turn increase the level of firms' investment in innovative projects as well as R&D expenditures (Storper and Venables, 2004; Weterings and Ponds, 2009; Helmers *et al.*, 2013, 2017; Eshleman and Lawson, 2016; Huang *et al.*, 2016; Chuluun *et al.*, 2017).

Moreover, the second and third hypothesis testing results for the Iranian and Iraqi firms are presented in Table 3. This Table contents show that coefficients for the variable of board interlock inside the industry (Interlocks_IND) in the Iranian firms' model are equal to −1.192** and Iraqi firms are −0.348*** for outside the industry, respectively. This denotes a negative and significant relationship between the interlock board inside the industry and firm innovation in our full sample. In contrast, the findings of the (Interlocks_OutIND) variable show a positive and statistically significant association between out-of-industry interlocked directors and firms' innovation due to the coefficients of 1.323*** and 0.216***, respectively. This means that only the companies listed outside the same industry allow their board directors to share information, knowledge, expertise and experience with firms in other industries. Whereas interlocked boards inside the industry are not likely to transmit innovation into the companies. One potential reasoning for such findings might be the firm's protection of their classified information, such as innovative ideas, which are

expected to provide them competitive advantages. The results of the first model's R^2 suggest that relatively 0.25 and 0.20 of the dependent variable's changes are explained with independent and control variables, respectively, for Iran and Iraq populations. The models' *p*-value demonstrates that at the 0.05 level, both countries' models are statistically significant.

Furthermore, according to the reports of Table 5, it is illustrated that the coefficients of the variable (indep) in the model for both the Iranian and Iraqi firms are equal to 1.467*** and 0.484*, respectively.

This shows a significant relationship between this variable and firm innovation, so the study's fourth hypothesis is confirmed for both Iranian and Iraqi firms. It denotes that board independence plays an efficient role in rectifying agency problems. According to previous findings, the efficient manager-monitoring by independent board's members motivates the CEOs to make wise decisions in line with stakeholders interests, leading to firm's innovation, as a result of considering long-run benefits of firms (Duchin *et al.*, 2010; Brown *et al.*, 2013; Knyazeva *et al.*, 2013; Kim and Luo, 2017). The results of the second model's R^2 suggest that relatively 0.28 and 0.24 of the dependent variable's changes are explained with independent and control variables, respectively, for Iran and Iraq populations. The models' *p*-value demonstrates that at the 0.05 level, both countries' models are statistically significant.

According to Table 6, coefficients for the variable of board interlock in the Iranian and Iraqi firms' models are equal to 0.096*** and 0.340***, respectively. This shows a positive and significant relationship between this variable and CSR in the Iranian and Iraq Stock Exchange. Therefore the fifth hypothesis is accepted for both Iranian and Iraqi firms. Such findings explore that interlocked directors are also motivated to obtain further information from other companies' CSR reporting and are likely to transmit such information in the firm's form of knowledge and experience. In this regard, Hazar and Dardour (2015), Graafland (2018) and Un *et al.* (2019) find that board interlocks positively affect firms' CSR reporting.

Further analyses show that the Iranian and Iraqi firms' variable (Interlocks_IND) coefficients are equal to −0.347** and −0.037**. The results for outside the industry (Interlocks_OutIND) are 0.021*** and 0.015*** for both countries listed firms, suggesting a positive and significant relationship between the interlock board in the outside industry firm CSR activities. The overall finding means only the companies competing outside the same industry allow their boards' members to share information, knowledge, expertise and

	Iran				Iraq			
Variables		Coef	Std. Err	*p*-value	Obs	Coef	Std. Err	*p*-value
Indep	1,026	1.467	0.651	0.024	276	0.484	0.964	0.000
Growth	1,026	0.8707	0.402	0.031	276	0.176	0.205	0.394
inst	1,026	−4.877	2.595	0.061	276	0.381	1.087	0.726
Bind	1,026	−2.252	1.695	0.184	276	0.584	0.206	0.050
roa	1,026	2.406	1.730	0.164	276	1.513	0.169	0.000
lev	1,026	2.897	0.768	0.007	276	0.582	0.241	0.015
Size	1,026	2.463	0.598	0.000	276	−1.589	0.544	0.004
_cons	1,026	−17.46	12.03	0.147	276	13.968	12.43	0.262
Coefficient of determination of the model (R^2)		0.2766				0.2387		
F Statistic of the model		4.60				3.30		
The *p*-value of the *F* statistic		0.000				0.0008		

Table 5.
The results of board independence on Innovation (Model 2)

Variables		Iran Coef	Std. Err	*p*-value	Obs	Iraq Coef	Std. Err	*p*-value
Interlocks	1,026	0.022	0.002	0.000	276	0.027	0.0105	0.01
Interlocks_IND	1,026	−0.347	0.015	0.021	276	−0.037	0.016	0.024
Interlocks_OutIND	1,026	0.021	0.004	0.000	276	0.015	0.008	0.05
Growth	1,026	0.018	0.036	0.000	276	0.001	0.0006	0.004
inst	1,026	−0.006	0.004	0.208	276	0.065	0.046	0.155
Bind	1,026	−0.002	0.002	0.298	276	0.004	108	0.656
roa	1,026	−0.002	0.001	0.310	276	0.031	0.062	0.607
Ley	1,026	0.055	0.012	0.000	276	0.009	0.0034	0.004
Size	1,026	0.088	0.005	0.000	276	0.035	0.017	0.047
_cons	1,026	0.03	0.021	0.158	276	0.433	0.257	0.093
Coefficient of determination of the model (R^2)		0.2341				0.2101		
F Statistic of the model		169.59				3.920		
The *p*-value of the *F* statistic		0.000				0.8645		

Table 6.
The results of board interlock on CSR (Model 3)

experience with firms in other industries in case of CSR activities. While interlocked boards inside the industry are not likely to transmit CSR experiences to other companies. The results of the first model's R^2 suggest that relatively 0.23 and 0.21 of the dependent variable's changes are explained with independent and control variables, respectively, for Iran and Iraq populations. The models' *p*-value demonstrates that at the 0.05 level, the Iranian companies' model is statistically significant.

Finally, the observations reported in Table 7 illustrates that the coefficients of the variable (indep) in the model for both Iranian and Iraqi firms are equal to 0.003** and 0.25***, respectively. This shows a positive and significant relationship between this variable and CSR, so the study's eighth hypothesis is confirmed for Iranian and Iraqi firms. It denotes that board members' independent monitoring significantly helps firms be involved in CSR activities and reporting. Since CSR reporting provides long-run benefits for companies and improves their reputation in front of public eyes, the independent board plays an alleviating role in decreasing agency conflicts through efficient manager-monitoring and considering firms' long-run objectives. These results also conform to that of Maran Jori and Ali Khani (2014), who found a significant and positive relationship between board independence and

Variables		Iran Coef	Std. Err	*p*-value	Obs	Iraq Coef	Std. Err	*p*-value
Indep	1,026	0.003	0.002	0.043	276	0.25	0.001	0
Growth	1,026	0.009	9E−04	0.313	276	0.005	0.007	0.47
inst	1,026	−0.005	0.004	0.208	276	0.098	0.042	0.02
Bind	1,026	−0.002	0.002	0.313	276	−0.002	0.007	0.748
roa	1,026	−0.002	7E−04	0.010	276	0.065	0.051	0.201
Ley	1,026	0.009	0.003	0.004	276	0.023	0.008	0.004
Size	1,026	0.008	0.004	0.055	276	0.03	0.000	0.06
_cons	1,026	0.030	0.022	0.166	276	−0.257	0.446	0.566
Coefficient of determination of the model (R^2)		0.2497				0.272		
F Statistic of the model		466.15				0.810		
The *p*-value of the *F* statistic		0.000				0.6042		

Table 7.
The results of board independence on CSR (Model 4)

CSR activities. The results of the first model's R^2 suggest that relatively 0.25 and 0.27 of the dependent variable's changes are explained with independent and control variables, respectively, for Iran and Iraq populations. The models' p-value demonstrates that at the 0.05 level, the Iranian companies' model is statistically significant.

5. Discussion and conclusion

The present study is concerned about the influence of board members' characteristics, including connectedness and independence, on the firm's innovation and CSR activities.

The obtained results from hypothesis testing show that board interlock and independence in both countries are willing to improve firms' innovation. It means that in emerging economies, companies are likely to share their knowledge, experience, skills, and generally, the items that might be applicable to improve firms' innovation through their common boards' members. Moreover, having controlled the industry index, we find that business environment innovation is willing to be transmitted to firms through outside industry sources in Iran and Iraq. However, competitors inside the same industry are demotivated to share their innovative information and CSR sources because they are likely to provide comparative advantages. Such findings mean that the board of directors' characteristics determine firms' performance through two channels. First of all, interlocked board members transmit innovative ideas and novel production procedures and are willing to improve firms' performance. Second, independent boards also establish efficient manager-monitoring strategies and improve firms' outcomes.

Further analyses also articulate that board interlock might be considered a mechanism to transmit information and experiences about CSR activities. The findings suggest a significant and positive association between board interlock and CSR activities in the two countries. Supportively, after controlling the industry index, the results show that Iranian and Iraqi firms' interlocked boards are likely to improve CSR activities based on their observation throughout outside industry sources. Finally, the results determine a positive relationship between board independence and CSR activities in both countries. These findings also denote that the independent board plays an alleviating role in reducing agency conflicts between stakeholders and managers. According to the literature, such a role is established through efficient manager-monitoring policies (Knyazeva *et al.*, 2013; Kim and Luo, 2017). They are more likely to take a long run horizon and follow stable development (Johnson and Greening, 1999; Liao *et al.*, 2015) and make a proper balance between short-run and long-run objectives, resulting in a positive rectifying impact of CSR and financial performance (Liao *et al.*, 2015).

The current study provides implications for equity owners, the board of directors' members and society. Equity owners may increase their wealth by establishing efficient corporate governance by appointing interlocked and independent board members. They can improve the companies' financial performance by transmitting innovation from other companies and establishing an efficient manager-monitoring policy. The board members can enhance their knowledge, experience and reputation by working in several companies simultaneously, improving companies' financial and operational performance under their supervision. According to our findings, individual practitioners can improve production at the macroeconomic level by sharing knowledge, experience, and generally, innovative ideas, from which the whole society can benefit.

The main limitation of this study comes from data unavailability from market companies. We expect that if the data of other companies competing out of Stock Exchange markets were available, the different results might become to a conclusion.

The current paper recommends that future researchers investigate the interlock board's potential effect on establishing internal control functions appointing audit firms.

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