

The current issue and full text archive of this journal is available on Emerald Insight at:
<https://www.emerald.com/insight/2444-8494.htm>

Momentum investing: evidence from the US tourism and hospitality

Mohamed Shaker Ahmed
Business Administration, Cairo University, Cairo, Egypt

Momentum
investing

269

Received 15 February 2021
 Revised 2 April 2021
 9 April 2021
 11 April 2021
 16 April 2021
 Accepted 17 April 2021

Abstract

Purpose – The present research aims to examine a range of momentum trading strategies for the tourism and hospitality sector.

Design/methodology/approach – The paper followed the methodology of Jegadeesh and Titman (1993) to construct the portfolios. In this methodology, all portfolios were formed and evaluated by their cumulative stock returns over the past J periods and holding the position for the next K periods. In total, nine formation and holding periods were used, represented by 3, 6 and 12. For example, strategy 3–3 (that is, strategy with $J = 3$ and $K = 3$) refers to the strategy that stocks are ranked based on their previous three months and then held for the next three months.

Findings – The findings demonstrated that none of these momentum investing strategies was profitable. Most of the results, however, show positive, but insignificant momentum returns. This finding can be interpreted as price reversal over a horizon of three to twelve months in the US hospitality and tourism sector. These results are robust to size, different formation and holding combinations, beta and turnover.

Research limitations/implications – Regarding the research limitations, this paper only considers the US tourism and hospitality sector. Therefore, the extension of results to other developed and developing markets should be taken carefully. Also, this paper relies only on the methodology of Jegadeesh and Titman (1993). Other methodologies could be suitable avenues for future research.

Practical implications – Investors and portfolio managers who seek for earning abnormal returns by investing in the US HT stocks can attain their hopes by constructing portfolios based on existing guidelines in the literature and adopting a short-term reversal trading strategy or by buying past losers and selling past winners of the US tourism and hospitality stocks.

Originality/value – This research contributes to the hospitality finance literature by offering the investors who are interested in the US hospitality and tourism sector an uncomplicated trading rule that uses real return data and is expected to generate actual returns. Moreover, the momentum strategy of Jegadeesh and Titman (1993) is never used in the hospitality finance literature.

Keywords Momentum, Trading strategies, Short-term reversal, Jegadeesh and Titman 1993, Hospitality and tourism stocks

Paper type Research paper

1. Introduction

Are momentum trading strategies profitable for the US “tourism and hospitality” stocks (hereafter HT)? There are two reasons why this question is particularly important. First, from a corporate point of view, financial markets provide long-term, stable sources of finance, especially because the HT industry requires intensive capital investment. Second, the HT industry is crucial for economic growth and many are interested in investing in this industry.

JEL Classification — G10, G11, G12, G14, G40

© Mohamed Shaker Ahmed. Published in *European Journal of Management and Business Economics*. Published by Emerald Publishing Limited. This article is published under the Creative Commons Attribution (CC BY 4.0) licence. Anyone may reproduce, distribute, translate and create derivative works of this article (for both commercial and non-commercial purposes), subject to full attribution to the original publication and authors. The full terms of this licence may be seen at <http://creativecommons.org/licenses/by/4.0/legalcode>



European Journal of Management
and Business Economics
Vol. 31 No. 3, 2022
pp. 269-284
Emerald Publishing Limited
e-ISSN: 2444-8494
p-ISSN: 2444-8451
DOI 10.1108/EJMBE-02-2021-0057

The economic importance of this industry for economic growth comes from the following factors:

First, the HT sector worldwide contributes significantly to inflows of hard currencies, equilibrium in the trade balance, employment rates and economic growth. According to Lim and Chan (2013), the HT sector contributed US\$ 6 trillion or 9% of total global gross domestic product (GDP) in 2011 and over 2.84 million employment opportunities (Hsu, 2017). Moreover, the HT stocks have attracted increased attention over the last years. For instance, the total initial public offerings (IPOs) have increased by US\$ 565 m in 2013 with 7% first-day return, and two of the top three IPOs performers were from the HT industry – Potbelly Corporation and Noodles and Company – where the prices of both doubled on the first trading day (Borghesi *et al.*, 2015). Furthermore, the number of stocks in the US stock market increased from 5,425 in 1981 to 8,485 in 1999 (by over 113%). Besides, more than \$ 626 bn of personal consumption in the US in 2010 went to food services and accommodation. In the United States, the country of interest, the HT is the most important sector. In 2017, foreign and US citizens spent more than \$1,035.7 bn on direct travel costs, providing more than \$165 bn altogether in tax revenues, and it was the largest employer in that year (US Travel Association, 2017). According to the World Tourism Organization (UNWTO), the HT industry has been the fastest-growing economic sector in the world over the past 60 years (Chang, *et al.*, 2014).

Short-term momentum is the most documented financial anomaly in finance literature. Some scholars have emphasized that momentum trading is a puzzle because it challenges the efficient market theory, which assumes that historical data cannot be used to predict price movements (Keynes, 1936; Fama, 1965, 1998; Ritter, 2003). However, numerous studies in the finance literature provide empirical evidence that stock returns can be predicted based on historical stock prices, especially short-term momentum and long-term reversal. For example, De Bondt and Thaler (1985) demonstrate that buying losing stocks over the two to five years and selling short winning stocks over the previous two to five years earns about 8% per year. Jegadeesh and Titman (1993) focus on the short-term momentum and show that buying winning stocks over a period of three to twelve months and short selling losing stocks over a period of three to twelve months lead to making an abnormal return of 1% per month. This is why interest in momentum trading strategies in stock markets has been renewed.

This momentum strategy that entails buying past losers and selling past winners was first documented by Jegadeesh and Titman (1993). Since then, the existence of momentum in many contexts has become well-documented in the literature. For instance, Rouwenhorst (1998) examines momentum in several international markets and documents significant momentum profits in 12 European equity markets. Rouwenhorst (1999) documents positive and significant momentum returns in emerging markets. Moskowitz and Grinblatt (2002) demonstrate the existence of momentum in several different industries. Finally, momentum is also seen in commodity markets (Erb and Campbell, 2006). While increasing interest in momentum is shown in the finance literature, the applicability of momentum strategies to the US HT sector, to the best of our knowledge, has attracted only limited attention from academics and practitioners.

Finance literature documents two broad explanations about why momentum exists in the stock market: risk-based and behavioral-based. The risk-based theory demonstrates that momentum profits are just compensation for risk (Conrad and Kaul, 1998). The behavioral-based explanation attributes the momentum either to behavioral biases (Barberis *et al.*, 1998; Daniel *et al.*, 1998; Grinblatt and Han, 2005) or to limitations of arbitrage that may prevent arbitrage and, in turn, prevent the mispricing from being corrected (Sadka, 2006; Shleifer, 2000; Shleifer and Vishny, 1997; Shiller, 1984). The term for the existence and persistence of these instances of mispricing is financial anomalies, of which momentum is an example, which creates predictability in stock returns.

The key contribution of this paper is the offering of a new investment strategy that uses real data and generates actual returns rather than expected returns in the US HT. The momentum strategy of Jegadeesh and Titman (1993) is never used in the hospitality finance literature, although it is widely used in the finance literature and among finance scholars and technical analysts. This study also gives the investors who are interested in the US HT sector uncomplicated trading rules that use real data and are expected to generate actual returns.

The present research aims to examine a range of momentum trading strategies for the HT sector following the methodology of Jegadeesh and Titman (1993). The range of formation and holding periods is 3, 6 and 12. Several robustness checks were conducted to examine the stability of the estimators by dividing the sample into two separate parts using size, beta and turnover and to support the main results. Our findings are of interest because they contradict a wide range of papers and evidence in the literature. The key findings of this paper show that not all momentum trading strategies are profitable, a finding which is robust to size, different formation and holding combinations, beta and turnover.

2. Literature review

The HT sector is worth a separate investigation because of its many unique fundamental characteristics: (1) It depends on the ALFO-business model (an asset-light and fee-oriented strategy). This strategy focuses more on loyalty-based assets, such as technology, franchising and management contracts and less on physical assets such as hotels and restaurants. According to Li and Singal (2019), this strategy reduces risk because it helps corporations to grow and expand; (2) HT companies are characterized by high leverage due to large investments in fixed assets, higher risk and stronger competition compared with other industries and high in capital intensity (Ahmad and Adaoglu, 2018) and (Dewally, *et al.*, 2017); (3) It is among the sectors with the lowest cash holdings in the economy (Kim, *et al.*, 2011); (4) It requires intensive initial investment because it invests heavily in facilities such as buildings and real estate to increase sales in current facilities, open new facilities and engage in acquisition (Dewally, *et al.*, 2017); (5) the ratio of institutional and managerial ownership has lately increased substantially. More than 50% of hotels are owned by private equity funds, real estate investment trusts and institutional investors (Kim and Jang, 2018) and (6) Traditional macroeconomic variables have limited explanatory power to predict stock returns (Ersan *et al.*, 2019). So far, to the best of our knowledge, no empirical work has examined the momentum trading strategies in HT, either in the finance literature or in HT finance literature. Finally, Chen *et al.* (2005) attest that the HT industry experienced noise trading similar to other industries such as construction, finance, electronics, transportation, [1] and wholesale and retail.

Scholars studied many aspects of the US HT stocks. For instance, Nowak (1993) argues that the HT industry requires large amounts of initial investment and is capital-intensive. This means that the US hospitality stocks are sensitive to changes in the monetary policy in general and to changes in interest rates in particular. Dewally *et al.* (2017) have found that hospitality companies prefer to undertake their large investments when the current sales growth is high, market volatility is low or the leverage is low. In the same context, Chen *et al.* (2005) provide evidence that Taiwanese hospitality stocks are affected significantly by economic variables and monetary policy variables. Ming-Hsiang Chen used Taiwanese stock prices in his work with Kim and Chen *et al.* (2007) to examine the existence of mean reversion behavior among hospitality stocks. In the hospitality sector, they found that earnings per share (EPS) is a good proxy for the fundamental values of stock prices, and there is a long-term convergence relationship between EPS as a proxy for fundamental values and stock prices. The findings also confirmed that a lower level of noise trading and lack of small size effect characterizes the hospitality sector, so that stock prices are more likely to be driven by their fundamental value proxied by EPS.

One of the above authors, Ming-Hsiang Chen (2012) compared the buy and hold trading strategy with the timing strategy from January 2, 1973 to May 30, 2008. His findings show that the buy and hold strategy is poor and that the timing strategy outperformed the buy and hold strategy for US hospitality stocks. With the timing strategy, investors buy HT stocks when the discount rate is decreasing and get rid of these stocks when the discount rate is increasing; they invest their money entirely in treasury bills. Then in 2013, Ming-Hsiang Chen divided the sample into bull and bear markets to examine whether the response of HT to the monetary policy news was symmetric or asymmetric. The findings reveal that the response of HT stocks to monetary news differs between bull markets and bear markets. Cheung and Lam (2015) conducted interesting research on what is called sin stocks. They compared the stock returns of sin stocks (stocks of casino companies, cross-listed stocks that are listed on the Hong Kong and US stock markets). The findings show that sin stocks experience high daily returns and high volatility proxied by standard deviation compared with market indices, and sin stocks in Hong Kong generate higher abnormal returns than these stocks in the US stock market. They attribute the difference between the abnormal returns in Hong Kong and the US to the different cultural characteristics of the two localities.

Lee *et al.* (2013) focus on online travel agencies and try to identify the determinants of systematic risk in the industry. The findings show that advertising expenditure, liquidity and firm size are the most important determinants. Meanwhile, Singal (2012) examines the predictive power of consumer sentiment on hospitality stock returns and indicates that consumer sentiment, at least in part, is a good predictor for hospitality stock returns. Chang and Zeng (2011) find that positive investor sentiment and the impact of this sentiment on stock returns outperform any other economic factors. Oak and Dalbor (2008) observe that institutional investors tend to possess large lodging stocks, high capital expenditure-to-asset ratio and high debt ratio. Continuing with institutional investors, Leung and Lee (2006) divide them into high and low examples. The findings indicate that tourism stocks with higher institutional ownership generate greater Monday returns than tourism stocks with lower institutional ownership. Shahzad and Caporin (2020) demonstrate that oil volatility plays an important role in the financial performance of tourism companies.

Jalkh *et al.* (in press) provide evidence that oil-implied volatility is more appropriate to hedge the downside risk of US travel and leisure stocks than the implied volatility of US stocks. Ersan *et al.* (2019) reveal that the impact of uncertainty in European and global economic policy on the stock returns of travel and leisure companies is significantly negative. Lee and Jang (2007) investigate the determinants of systematic risk using a sample of 16 US airline companies from 1997 through 2002. The findings indicate that profitability, growth and safety are significantly and negatively related to systematic risk, while leverage and size are significantly and positively related to systematic risk.

Recently, Jareno *et al.* (in press) used a quantile regression model to investigate the validity of the Fama-French Five-Factor model (2015) to predict the stock returns of hospitality firms. Using a sample of 12 European companies, the findings support the superiority of the quantile regression model over the ordinary least square estimator in predicting the stock returns of hospitality firms. Aharon (in press) demonstrates that the consumer sentiment index and the consumer confidence index are better than the economic policy uncertainty index and the volatility index in predicting stock returns of tourism and leisure firms. Qin *et al.* (2021) found a positive relationship between oil prices and stock returns of travel and leisure firms using a sample of Chinese firms from January 2000 to December 2018 and the impact of policy uncertainty on stock returns to be sometimes positive and at other times negative.

Hospitality finance theory stipulates that the monetary policy has a strong predictive power in the HT industry because the need for large initial investments characterizes this

industry. Therefore, the HT industry is sensitive to changes in interest rates (Collier and Gregory, 1995; Chen, 2010; Goukasian *et al.*, 2012). Chen (2013) reveals that hospitality stock returns respond differently to changes in the monetary policy in the bear market compared to those changes in the bull market. In the same context, Barrows and Naka (1994) state that three macroeconomic factors may play an important role in predicting stock returns in the US HT industry, namely, the growth rate in money supply, changes in domestic consumption and changes in inflation rate. Lim and Chan (2013) study the determinants of HT stock returns in New Zealand using the arbitrage pricing theory and find that market risk, money supply and discount rate are good predictors for HT stock returns.

Chen (2010) contradicts the previous study and explains that there is no relationship between discount rate and hospitality stock return. Therefore, the discount rate has no predictability power on hospitality stock returns. Singal (2012) provided evidence that consumer sentiment plays a role in predicting hospitality stock returns. Demir *et al.* (2017) confirm that the prediction of hospitality stock returns needs to consider eight macroeconomic variables, namely, consumer price index, imports, exchange rate, consumer confidence index, oil price, money supply, foreign tourist arrivals and monthly market return. Finally, Ersan *et al.* (2019) document that the European and global economic policy uncertainties are negatively and significantly related to hospitality stock returns.

The key shortcomings of the above studies are as follows: (1) Some econometric techniques and models are too sophisticated to be used by practitioners. (2) Some models required tracking more than time series of macroeconomic variables, which may lead to confusion because of the contradictory indications of these variables. (3) The use of these variables may be viable for some times but nonviable for others and the sign of each variable may differ from one time period to another. (4) It is noticed that there is no consensus on which variables are the most important in the US HT and each study offers a distinct set of variables.

I hypothesize that financial anomalies such as momentum and reversal may exist among the HT stocks in the United States. The explanation for this hypothesis is that the US HT stocks experience noise trading in the stock market (Chen *et al.*, 2005). These noise traders commit systematic behavioral errors that may either prevent them from processing the information rationally, such as overconfidence, representativeness heuristics, underreaction and overreaction, or deprive them of having complete information, such as having information on only some securities not all securities in the market, making mistakes in forecasting due to the investors' prior beliefs, not knowing the structural relationships in the economy or not knowing the correct data-generating process. Thus, these traders can be considered the key factor deviating the stock prices away from the fundamental value and destabilizing the market prices because they commit systematic mistakes or depend on improper probability assessment and sometimes trade using irrelevant information, resulting in a reduction in the market efficiency because they take positions and actions that prevent the new information from incorporating into prices, which keeps the prices away from the fundamental values and create some sort of predictability, e.g. momentum and reversal in stock returns (Brav and Heaton, 2002; Bloomfield *et al.*, 2009). My first hypothesis can then be stated:

H1. Ceteris paribus, financial anomalies are expected to exist among the US HT stocks.

3. Methodology

3.1 Data

This paper used a total of 301 firms with 24,272 observations from the US HT sector. These firms are the largest in the US stock market since they are extracted from the Russell 3,000 index. Monthly data were collected from Bloomberg covering 246 months. The following

tourism subindustries traded in NYSE, AMEX and NASDAQ were selected: (1) Transportation by air (two-digit SIC = 45), (2) Transportation services (two-digit SIC = 47), (3) Eating and drinking places (two-digit SIC = 58), (4) Hotels, rooming houses, camps and other lodging places (two-digit SIC = 70) and Amusements and recreation services (two-digit SIC = 79).

3.2 The methodology of Jegadeesh and Titman (1993)

The paper followed the methodology of Jegadeesh and Titman (1993) to construct the portfolios. In this methodology, the overlapping technique was used, and all portfolios were formed and evaluated by their cumulative stock returns over the past J periods, holding the position for the next K periods. Then, at the end of each J period, the stocks were ranked depending on past cumulative returns and were divided into ten equally weighted portfolios. In total, nine formation and holding periods were used, represented by 3, 6 and 12. For example, strategy 3–3 (that is, strategy with $J = 3$ and $K = 3$) refers to the strategy that stocks are ranked based on their previous three months and then held for the next three months. For all momentum strategies, one month was skipped between the formation and holding period to avoid the possible bias of bid–ask spread. Following Chui *et al.* (2003), the 30% breakpoint for winner and loser portfolios was chosen instead of the traditional 10% breakpoint, due to the small size of our sample. The methodology of Jegadeesh and Titman (1993) can be explained by Figure 1. All stocks in the sample are segmented into ten equally weighted portfolios. Each portfolio is constructed based on the past returns over the J periods and is ranked ascendingly.

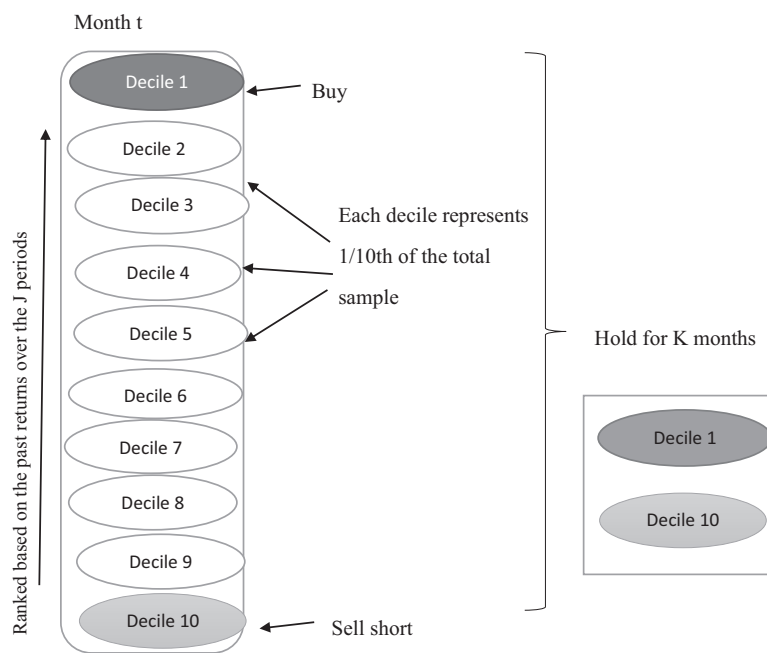
The top decile (decile 1) in the above figure is the winner portfolio while the bottom decile is the loser portfolio (decile 10). All of the above positions, long and short, should be closed out at the end of every month and replaced by new deciles. Also, in every month t , there are many overlapping portfolios where each portfolio is constructed from buying the winner portfolio (decile 1) and selling short the loser portfolio (decile 10). Finally, the return of selling the loser portfolio, the short position, should be deducted from the return of the long position.

4. Empirical results

Table 1 describes the contribution of each industry to the overall sample of the HT sector. The Eating and drinking places (SIC code: 58) is the largest industry in the HT sector, with 34.22%. Hotels, rooming, houses, camps and other lodging places (SIC code: 70) is the second largest industry, with 27.24 of the overall sample. Transportation services (SIC code: 47), in contrast, is the smallest industry in the HT sector, with 4.99%.

Table 2 summarizes the mean returns, standard deviation and reward-to-risk for each momentum portfolio. The rows represent the ranking periods ($J = 3, 6$ and 12 months), and the columns represent the holding periods ($K = 3, 6$ and 12 months). Regarding strategies, on average momentum strategies can earn 0.107% a month, with a range from 0.01 for the 6–6 momentum strategy to 0.267% for the 3–12 momentum strategy. The same table also reports the monthly standard deviations and reward-to-risk ratios of each portfolio. Inconsistently with the rational expectation theory, the portfolio with the highest risk or volatility (3–12) does not earn the highest reward-to-risk ratio, but the portfolio with the lowest risk or volatility (SD = 0.023) earns the second-highest reward-to-risk (6.261%).

Table 3 summarizes the monthly average returns of losers, winners and momentum strategies run using all the stocks in the sample size, where winners are defined as the top 30% of past returns and losers are defined as the bottom 30% of past returns. As previously mentioned, these portfolios are formed with equal weights and held for K subsequent months ($K = 3, 6, 12$). This results in nine momentum strategies of J and K months. For example,



Note(s): See Friedrich, p. 48

Figure 1. Jegadeesh and Titman (1993) methodology

SIC code	Industry	Number of firms per industry	Percentage
45	Transportation by air	49	16.28
47	Transportation services	15	4.99
58	Eating and drinking places	103	34.22
70	Hotels, rooming, houses camps and other lodging places	82	27.24
79	Amusements and recreation services	52	17.27
Total		301	100

Note(s): This table reports the industries that make up the tourism and hospitality sector, showing a two-digit SIC for each, the number of companies in each industry and the proportion of each industry in the whole sample

Table 1. The proportion of each industry in the whole sample

strategy 3-3 (that is, strategy with $J = 3$ and $K = 3$) refers to the strategy that stocks are ranked based on their previous three months and then held for the next three months. If the difference between winners' returns and losers' returns ($W-L$) is statistically significantly greater than zero, then there is a momentum profit. Otherwise, there are no momentum profits. The results are inconsistent with those of Jegadeesh and Titman (1993) because all momentum strategies do not generate significant positive returns none of them is statistically significant and all t -values are statistically insignificant. Regarding loser and winner portfolios, the returns of all winner portfolios are significantly positive and vary between 0.8559 and 1.151. Similarly, the returns of all loser portfolios are also significantly positive and vary between 0.851 and 1.109.

This finding is inconsistent with (Jegadeesh and Titman, 1993, 2001; Rouwenhorst, 1998) who found positive momentum profits over a horizon of three to twelve months. In other

Table 2.
Summary statistics of
momentum portfolios
based on 30%
breakpoint

	Holding period three months	Holding period six months	Holding period 12 months
<i>Panel A: ranking period three months</i>			
Mean	-0.253	0.190	0.267
St. deviation	0.039	0.038	0.044
Reward-to-risk	-6.487	5	6.068
<i>Panel B: ranking period six months</i>			
Mean	0.012	0.010	0.264
St. deviation	0.031	0.043	0.042
Reward-to-risk	0.387	0.233	0.286
<i>Panel C: ranking period 12 months</i>			
Mean	0.144	0.212	0.121
St. deviation	0.023	0.030	0.038
Reward-to-risk	6.261	7.067	3.184

Note(s): This table presents the momentum portfolios based on 30% breakpoint. Momentum is a portfolio that buys the winner portfolio (top 30% of stocks) and sells the loser portfolio (bottom 30% of stocks) short. Returns are measured as proportions rather than percentages. The reward-to-risk ratio is the ratio of monthly mean to the monthly standard deviation

Table 3.
Winners, losers and
momentum return over
3–12 month horizons

		$K = 3$	$K = 6$	$K = 12$
$J = 3$	Winners	0.855 (4.029)	1.015 (4.801)	1.112 (5.387)
	Losers	1.109 (3.844)	1.003 (3.701)	0.968 (3.734)
	$W-L$	-0.253 (-1.016)	0.012 (0.060)	0.144 (0.955)
$J = 6$	Winners	0.989 (4.488)	1.109 (5.170)	1.146 (5.491)
	Losers	0.979 (3.388)	0.918 (3.277)	0.934 (3.495)
	$W-L$	0.010 (0.036)	0.190 (0.782)	0.212 (1.083)
$J = 12$	Winners	1.117 (5.088)	1.151 (5.410)	1.111 (5.354)
	Losers	0.851 (2.790)	0.886 (2.989)	0.989 (3.488)
	$W-L$	0.267 (0.937)	0.264 (0.978)	0.121 (0.486)

Note(s): This table reports the winners, losers and momentum portfolios. The loser (L) refers to the portfolio with the lowest return in the selection period, while the winner (W) refers to the portfolio with the highest return. Momentum portfolio ($W-L$) is the difference between winners and losers. For each portfolio, the table shows the portfolio's monthly return constructed following Jagadeesh and Titman (1993) on the basis of their past J periods where $J = 3, 6$ and 12 and holding the position for the next K periods where $K = 3, 6$ and 12 using a period of 246 months starting from January 1995. This forms a total of nine portfolios at the intersections between J and K . For instance, $J=3, K=3$ is the strategy that is formed according to the returns of the previous three months and held for three after formation. Finally, the figures in parentheses are the t -statistics

words, Jegadeesh and Titman (1993) found past winners tend to outperform past losers by 1% on a monthly basis. Jegadeesh and Titman (1993, 2001) attribute this interesting phenomenon to the underreaction bias to new information. In the context of the US HT sector, this finding, however, is consistent with Hameed and Kusnadi (2002) who discovered positive, but insignificant momentum returns. Hameed and Kusnadi (2002) demonstrate that portfolios are formed at the end of ranking periods. As a result, the monthly closing price that we use in the ranking period could be the ask or the bid price. The monthly closing price of the loser is expected to be the bid price. The monthly closing price, however, is expected to be the ask price. They and this research attributed this positive and insignificant return to price reversal that weakens the momentum return over a horizon of three to twelve months. Moreover, the findings of this paper are consistent with Chen *et al.* (2007) and Leung and Lee (2006) concerning the existence of financial anomalies among the HT stocks. While this paper

found positive and insignificant momentum in the US HT, Chen *et al.* (2018) found negative and significant momentum over the short, intermediate and long-term horizons using a sample of Taiwanese hotels.

To check the robustness of the results on momentum, we divided our sample into two subsamples based on size, beta and turnover in Tables A1–A3 in Appendix. This resulted in six subsamples, namely above-median size, below-median size, above-median beta, below-median beta, above-median turnover and below-median turnover. Then, we ran the Jegadeesh and Titman (1993) procedure for each subsample of the six. The vast majority of the robustness checks supported the main results, generating no positive significant momentum returns.

These findings support our hypothesis that the existence of noise trading who committed systematic and behavioral errors may lead to the predictability of US HT stock returns. To be more specific, I discovered short-term reversal resulting from overreaction to news. This overreaction stems from the representative heuristic theory of Tversky and Kahneman (1974). According to this theory, investors overweight recent information while underweight past news. This could result in extravagant pessimism over bad news and lavish optimism over good news. Consequently, stock prices may diverge from the fundamental value in the short-term and create short-term reversal or short-term mean reversion.

5. Conclusion and discussion

This research examines the profitability of the momentum investing strategy in the US HT stocks using a sample of 301 US HT stocks and monthly data from the HT firms spanning 246 months of monthly data extracted from the Russell 3,000 index. The methodology of Jegadeesh and Titman (1993) was followed to construct the $J \times K$ momentum portfolios with the formation and holding periods of three, six and 12 months. The paper contributes to the existing literature by offering a simple trading strategy to aid those interested in investing in the US HT sector rather than the complicated models and factors offered in the hospitality finance literature. The findings demonstrated that none of these momentum investing strategies were profitable. Most of the results, however, exhibit positive, yet insignificant momentum returns. These results are robust to size, different formation and holding combinations, beta and turnover and can be attributed to the price reversal over a horizon of three to twelve months in the US HT sector, implying that technical and fundamental analyses may be beneficial tools to predict future returns within the sector.

In the finance literature, the short-term reversal trading strategy has been documented and discussed for more than 40 years. For instance, Jagadeesh (1990) explores that a short-term reversal strategy which entails buying past losers and selling former winners could produce a monthly profit of 2% for the period of 1934–1987. Lehmann (1990), on the other hand, utilized the weekly data over the period of 1962–1986 and documents that the short-term reversal strategy earns 1.79% per week. The usage of daily data and intraday data returns the same conclusion (Cox and Peterson, 1994; Lin and Xiong, 2018). This phenomenon can be attributed to one of two explanations: first, market makers request compensation for providing liquidity and bearing inventory imbalances (Grossman and Miller, 1988). Second, some behaviorists attributed short-term reversal to the overreaction to information as behavioral bias leading the prices to deviate from the fundamental value and creating mispricing (Shiller 1984; Subrahmanyam 2005).

This research has several important implications in understanding the behavior of the US HT stocks, including the implementation of short-term reversal strategy in practice and in understanding the limitations of efficient market theory (EMT) among the US HT stocks. Theoretically, the EMT holds that stock returns of past information cannot be used to predict future returns. Therefore, the profitable trading strategies in this research are not consistent with the EMT concerning the US HT stocks, and they do challenge the EMT. Moreover, it is

possible in the US HT stocks to make abnormal returns through investment trading strategies. This predictability denies the notion of the random walk which is always connected to the EMT.

Random walk is defined as random movements of stock prices resulting from a random and unpredictable production and flow of news. In other words, the notion of the random walk indicates that current price movements are completely independent of past price movements because past news is fully and immediately incorporated into past prices, while current price movements reflect only the currently available news. Therefore, all price movements are unpredictable (Fama, 1998). The existence of short-term reversal and return predictability provides empirical evidence on the failure of random walk. Also, this implies that there are systematic valuation errors among the US HT stocks. All in all, this research opens new doors on the HT sector and may assist researchers of hospitality finance and practitioners better understand some financial phenomena in the US HT stock market.

Practically, this research addresses how far technical and fundamental analyses are useful. Because the market of US HT stocks is not efficient and, in turn, the market prices do not fully reflect the available information (given that new information is incorporated into prices without delay), there is a difference between intrinsic value and market prices because the market cannot estimate the stock value accurately. In this case, where the market is not efficient, both technical analysis, which is the use of historical stock prices to predict the future returns, and fundamental analysis, which is the use of company earning and asset values to predict future returns, may be beneficial and may be expected to generate abnormal returns. Another practical implication of this research, investors and portfolio managers who seek for earning abnormal returns by investing in the US HT stocks can attain their hopes by constructing portfolios based on existing guidelines in the literature and adopting a short-term reversal trading strategy or by buying past losers and selling past winners of the US HT stocks. Overall, the findings impart economically prized information to investors who are interested in the US HT stocks to enable them to better predict the behavior of these stocks.

From a regulation point of view, regulators should consider this mispricing and take actions to improve transparency and dissemination of information to maintain the market efficiency and to reduce behavioral biases in the market. Regarding the research limitations, this paper only considers the US HT sector. Therefore, the extension of results to other developed and developing markets should be taken carefully. Also, this paper relies only on the methodology of Jegadeesh and Titman (1993). Other methodologies could be suitable avenues for future research. There is much room for future investigation of the US HT stocks, including the test of contrarian investing strategies, pair trading strategies and style momentum. Moreover, future research should be conducted into such matters as other financial anomalies, e.g. size effect, value effect, Monday effect and January effect in the US HT stocks. Finally, future researchers could focus on HT in important and unique emerging markets such as China, where the stock market is negatively correlated with the US stock market.

Note

1. The transportation industry includes railroad transportation, highway passenger transportation, motor freight transportation and warehousing, US postal services, water transportation, transportation by air, pipelines except for natural gas and transportation services. In this paper, we include only transportation by air and transportation services that are considered part of the tourism and hospitality sector. Other subsectors of the transportation sector are ignored.

Rereferences

Aharon, D.Y. (in press), "Sentiment, confidence and uncertainty: the case of tourism and leisure stocks", *Cornell Hospitality Quarterly*, pp. 1-14.

- Ahmad, W. and Adaoglu, C. (2018), "Cash management in the travel and leisure sector: evidence from the United Kingdom", *Applied Economics Letters*, Vol. 26 No. 7, pp. 618-621.
- Barberis, N., Shleifer, A. and Vishny, R. (1998), "A model of investor sentiment", *Journal of Financial Economics*, Vol. 49, pp. 307-343.
- Barrows, C.W. and Naka, A. (1994), "Use of macroeconomic variables to evaluate selected hospitality stock returns in the US", *International Journal of Hospitality Management*, Vol. 13, pp. 119-128.
- Bloomfield, R., O'Hara, M. and Saar, G. (2009), "How noise trading affects markets: an experimental analysis", *Review of Financial Studies*, Vol. 22 No. 6, pp. 2275-2302.
- Borghesi, R., Annaraud, K. and Singh, D. (2015), "Are hospitality industry IPO stock returns predictable?", *International Journal of Hospitality Management*, Vol. 44, pp. 23-27.
- Brav, A. and Heaton, J. (2002), "Competing theories of financial anomalies", *Review of Financial Studies*, Vol. 15 No. 2, pp. 575-606.
- Chang, C. and Zing, Y.Y. (2011), "Impact of terrorism on hospitality stocks and the role of investor sentiment", *Cornell Hospitality Quarterly*, Vol. 52 No. 2, pp. 165-175.
- Chang, C.-L., Hsu, H.-K. and McAleer, M. (2014), "The impact of China on stock returns and volatility in the Taiwan tourism industry", *The North American Journal of Economics and Finance*, Vol. 29, pp. 381-401.
- Chen, M.H. (2010), "Federal reserve monetary policy and US hospitality stock returns", *Tourism Economics*, Vol. 16 No. 4, pp. 833-852.
- Chen, M.-H. (2012), "A Timing strategy for investments in the US hospitality stocks", *Journal of Hospitality and Tourism Research*, Vol. 36 No. 3, pp. 283-311.
- Chen, M.-H. (2013), "Asymmetric response of hospitality stock prices to Fed policy actions", *International Journal of Hospitality Management*, Vol. 33, pp. 129-139.
- Chen, M.-H., Kim, W.G. and Kim, H.J. (2005), "The impact of macroeconomic and non-macroeconomic forces on hotel stock returns", *International Journal of Hospitality Management*, Vol. 24 No. 2, pp. 243-258.
- Chen, M.-H., Kim, W.G. and Chen, C.-Y. (2007), "An investigation of the mean reversion of hospitality stock prices towards their fundamental values: the case of Taiwan", *International Journal of Hospitality Management*, Vol. 26, pp. 453-467.
- Chen, M.-H., Zhao, Z., Wang, K. and Lv, W.Q. (2018), "The momentum effect on Taiwanese hotel stocks", *International Journal of Hospitality Management*, Vol. 71, pp. 141-150.
- Cheung, W.M.Y. and Lam, D. (2015), "Comparing the price of sin: abnormal returns of cross-listed casino gaming stocks in the Hong Kong and US markets", *International Journal of Hospitality Management*, Vol. 45, pp. 73-76.
- Chui, A.C., Titman, S. and Wei, K.C.J. (2003), "Intra-industry momentum: the case of REITs", *Journal of Financial Markets*, Vol. 6 No. 3, pp. 363-387.
- Collier, P. and Gregory, A. (1995), "Investment appraisal in services industries: a field study analysis of the UK hotel sector", *Management Accounting Research*, Vol. 6, pp. 33-57.
- Conrad, J. and Kaul, G. (1998), "An anatomy of trading strategies", *Review of Financial Studies*, Vol. 11, pp. 489-519.
- Cox, D.R. and Peterson, D.R. (1994), "Stock returns following large one-day declines: evidence on the short-term reversals and long-term performance", *The Journal of Finance*, Vol. 49, pp. 255-267.
- Daniel, K., Hirshleifer, D. and Subrahmanyam, A. (1998), "Investor psychology and security market under-and overreactions", *The Journal of Finance*, Vol. 53, pp. 1839-1885.
- De Bondt, W.F.M. and Thaler, R.H. (1985), "Does the stock market overreact?", *The Journal of Finance*, Vol. 40 No. 3, pp. 793-805.
- Demir, E., Alici, Z.A. and Lau, M.C.K. (2017), "Macro explanatory factors of Turkish tourism companies' stock returns", *Asia Pacific Journal of Tourism Research*, Vol. 22 No. 4, pp. 370-380.

- Dewally, M., Flaherty, S. and Shao, Y. (2017), "Determinants of financial policy in the hospitality sector in the United States", *Tourism Economics*, Vol. 23 No. 3, pp. 523-542.
- Erb, C.B. and Campbell, H.R. (2006), "The strategic and tactical value of commodity futures", *Financial Analyst Journal*, Vol. 62, pp. 78-101.
- Ersan, O., Akron, S. and Demir, E. (2019), "The effect of European and global uncertainty on stock returns of travel and leisure companies", *Tourism Economics*, Vol. 25, pp. 51-66.
- Fama, E.F. (1965), "The behavior of stock market prices", *Journal of Business*, Vol. 38 No. 1, pp. 34-105.
- Fama, E.F. (1998), "Market efficiency, long-term returns, and behavioral finance", *Journal of Financial Economics*, Vol. 49, pp. 283-306.
- Goukasian, L., Ma, Q. and Majbouri, M. (2012), "The monetary policy risks of hospitality stocks", *Cornell Hospitality Quarterly*, Vol. 53 No. 4, pp. 339-346.
- Grinblatt, M. and Han, B. (2005), "Prospect theory, mental accounting and momentum", *Journal of Financial Accounting*, Vol. 78, pp. 311-339.
- Grossman, S. and Miller, M. (1988), "Liquidity and market structure", *The Journal of Finance*, Vol. 43, pp. 617-633.
- Hameed, A. and Kusunadi, Y. (2002), "Momentum strategies: evidence from Pacific basin stock markets", *Journal of Financial Research*, Vol. 25 No. 3, pp. 383-397.
- Hsu, P.-P. (2017), "Examination of Taiwan's travel and tourism market cycle through a two-period Markov regime-switching model", *Tourism Management*, Vol. 63, pp. 201-208.
- Jegadeesh, N. (1990), "Evidence of predictable behavior of security returns", *The Journal of Finance*, Vol. 45, pp. 881-898.
- Jalkh, N., Bouri, E., Vo, X.V. and Dutta, A. (in press), "Hedging the risk of travel and leisure stocks: the role of crude oil", *Tourism Economics*.
- Jareno, F., Escribano, A. and Torres, M.P. (in press), "Analysis of stock returns of main European service and tourism companies", *Tourism Economics*, pp. 1-31.
- Jegadeesh, N. and Titman, S. (1993), "Returns to buying winners and selling losers: implications for stock market efficiency", *The Journal of Finance*, Vol. 48, pp. 65-91.
- Jegadeesh, N. and Titman, S. (2001), "Profitability of momentum strategies: an evaluation of alternative explanations", *The Journal of Finance*, Vol. 56 No. 2, pp. 699-720.
- Keynes, J. (1936), *The General Theory of Employment, Interest and Money*, Macmillan, London.
- Kim, H.S. and Jang, S.S. (2018), "Does hotel ownership structure influence capital expenditures?", *Cornell Hospitality Quarterly*, Vol. 59 No. 4, pp. 325-339.
- Kim, J., Kim, H. and Woods, D. (2011), "Determinants of corporate cash-holding levels: an empirical examination of the restaurant industry", *International Journal of Hospitality Management*, Vol. 30, pp. 568-584.
- Lee, J.-S. and Jang, S. (2007), "The systematic-risk determinants of the US airline industry", *Tourism Management*, Vol. 28, pp. 434-442.
- Lee, W.S., Moon, J., Lee, S. and Kerstetter, D. (2013), "Determinants of systematic risk in the online travel agency industry", *Tourism Economics*, Vol. 21 No. 2, pp. 341-355.
- Lehmann, B. (1990), "Fads, martingales, and market efficiency", *Quarterly Journal of Economics*, Vol. 105, pp. 1-28.
- Leung, W.K. and Lee, T.S. (2006), "Institutional investors and the Monday effect on tourism stocks", *International Journal of Hospitality Management*, Vol. 25, pp. 348-372.
- Li, Y. and Singal, M. (2019), "Capital structure in the hospitality industry: the role of the asset-light and fee-oriented strategy", *Tourism Management*, Vol. 70, pp. 124-133.
- Lim, C. and Chan, F. (2013), "An empirical modelling of New Zealand hospitality and tourism stock returns", *ISRN Economics*, Vol. 3, pp. 1-10.

- Lin, S. and Xiong, X. (2018), "Intraday reversal, liquidity and anchored expectation", available at: http://cfrc.pbcfs.tsinghua.edu.cn/Public/Uploads/upload/CFRC2019_1680.pdf (accessed 9 September 2020).
- Moskowitz, T.J. and Grinblatt, M. (2002), "Do industries explain momentum?", *The Journal of Finance*, Vol. 54 No. 4, pp. 1249-1290.
- Nowak, L.S. (1993), *Monetary Policy and Investment Opportunities*, Quorum Books, Westport, CT.
- Oak, S. and Dalbor, M.C. (2008), "Institutional investor preferences for lodging stocks", *International Journal of Hospitality Management*, Vol. 27, pp. 3-11.
- Qin, Y., Chen, J. and Dong, X. (2021), "Oil prices, policy uncertainty and travel and leisure stocks in China", *Energy Economics*, Vol. 96 April.
- Ritter, J.R. (2003), "Behavioral finance", *Pacific-Basin Finance Journal*, Vol. 11, pp. 429-437.
- Rouwenhorst, K.G. (1998), "International momentum strategies", *The Journal of Finance*, Vol. 53 No. 1, pp. 267-284.
- Rouwenhorst, G.K. (1999), "Local return factors and turnover in emerging stock markets", *The Journal of Finance*, Vol. 54 No. 2, pp. 1439-1464.
- Sadka, R. (2006), "Momentum and post-earnings-announcement drift anomalies: the role of liquidity risk", *Journal of Financial Economics*, Vol. 80 No. 2, pp. 309-349.
- Shahzad, S.J.H. and Caporin, M. (2020), "On the volatilities of tourism stocks and oil", *Annals of Tourism Research*, Vol. 81, pp. 102705-102708.
- Shiller, R.J. (1984), "Stock prices and social dynamics", *Brookings Papers on Economic Activity*, Vol. 2, pp. 457-510.
- Shleifer, A. (2000), *Inefficient Markets: An Introduction to Behavioral Finance*, Oxford University Press, New York.
- Shleifer, A. and Vishny, R.W. (1997), "The Limits of arbitrage", *The Journal of Finance*, Vol. 52 No. 1, pp. 35-55.
- Singal, M. (2012), "Effect of consumer sentiment on hospitality expenditures and stock returns", *International Journal of Hospitality Management*, Vol. 31, pp. 511-521.
- Subrahmanyam, A. (2005), "Distinguishing between rationales for short-term horizon predictability of stock returns", *Financial Review*, Vol. 40, pp. 11-35.
- Tversky, A. and Kahneman, D. (1974), "Judgment under uncertainty: heuristics and biases", *Science*, Vol. 185, pp. 1124-1131.
- US Travel Association (2017), "US travel and tourism overview", available at: https://www.ustravel.org/system/files/media_root/document/Research_Fact-Sheet_US-Travel-and-Tourism-Overview.pdf.

Further reading

- Friedrich, E.A. (2020), available at: https://scholar.sun.ac.za/bitstream/handle/10019.1/4373/friedrich_profitability_2010.pdf?sequence=1&isAllowed=y.
- Malkiel, B.G. (2003), "The efficient market hypothesis and its critics", *The Journal of Economic Perspectives*, Vol. 17 No. 1, pp. 59-82.
- Napierala, T. and Szutowski, D. (2019), "The impact of localized innovations on the stock returns of tourism companies", *International Journal of Tourism Research*, Vol. 21, pp. 108-121.

Corresponding author

Mohamed Shaker Ahmed can be contacted at: mashaker@foc.cu.edu.eg

Table A1.
Winners, losers and momentum return over 3–12 months horizons for above median size stocks and below median size stocks in sequence

	Above median size			Below median size		
	<i>K</i> = 3	<i>K</i> = 6	<i>K</i> = 12	<i>K</i> = 3	<i>K</i> = 6	<i>K</i> = 12
<i>J</i> = 3						
Winners	1.363 (5.987)	1.303 (5.722)	1.361 (5.977)	0.115 (0.309)	0.385 (1.063)	0.485 (1.430)
Losers	1.275 (4.339)	1.178 (4.218)	1.158 (4.059)	1.121 (2.784)	0.678 (1.785)	0.568 (1.568)
<i>W</i> – <i>L</i>	0.088 (0.344)	0.125 (0.610)	0.203 (1.121)	–1.030 (–2.448)	–0.295 (–0.825)	–0.083 (–0.347)
<i>J</i> = 6						
Winners	1.214 (5.013)	1.327 (5.489)	1.305 (5.638)	0.031 (0.89)	0.381 (1.126)	0.747 (2.389)
Losers	1.003 (3.295)	0.983 (3.223)	0.991 (3.118)	0.763 (1.760)	0.358 (0.821)	0.696 (1.746)
<i>W</i> – <i>L</i>	0.211 (0.704)	0.344 (1.235)	0.314 (1.252)	–0.667 (–1.348)	–0.000 (–0.000)	0.050 (1.331)
<i>J</i> = 12						
Winners	1.332 (5.581)	1.449 (6.265)	1.339 (5.747)	0.372 (1.005)	0.633 (1.679)	0.415 (1.264)
Losers	0.969 (2.813)	1.201 (3.601)	1.285 (3.894)	0.289 (0.631)	0.663 (1.427)	0.540 (1.189)
<i>W</i> – <i>L</i>	0.363 (1.044)	0.248 (0.783)	0.053 (0.180)	0.113 (0.223)	–0.087 (–0.171)	–0.125 (–0.272)

Note(s): This table reports the winners, losers and momentum portfolios. The loser (*L*) refers to the portfolio with the lowest return in the selected period, while the winner (*W*) refers to the portfolio with the highest return. Momentum portfolio (*W*–*L*) is the difference between winners and losers. For each portfolio, the table shows the portfolio's monthly return constructed following Jagadeesh and Titman (1993) on the basis of their past/*J* periods where *J* = 3, 6 and 12 and holding the position for the next *K* periods where *K* = 3, 6 and 12 using a period of 246 months starting from January 1995. This forms a total of nine portfolios at the intersections between *J* and *K*. For instance, *J*3-*K*3 is the strategy that is formed based on the returns of the previous three months and held for three after formation. Finally, the figures in parentheses are the *t*-statistics

	Above median beta			Below median beta		
	$K = 3$	$K = 6$	$K = 12$	$K = 3$	$K = 6$	$K = 12$
$J = 3$						
Winners	1.420 (4.003)	1.431 (3.388)	1.292 (3.638)	0.396 (1.272)	0.851 (3.007)	0.931 (3.731)
Losers	1.719 (3.590)	1.463 (3.379)	1.205 (2.705)	0.712 (1.910)	0.766 (2.501)	0.869 (2.940)
$W-L$	-0.299 (-0.620)	-0.320 (-0.815)	-0.087 (0.273)	-0.291 (-0.738)	0.085 (0.270)	0.063 (0.289)
$J = 6$						
Winners	1.077 (3.016)	1.344 (3.460)	1.162 (3.424)	1.006 (3.247)	0.893 (3.113)	0.963 (3.713)
Losers	1.714 (3.561)	0.798 (1.684)	1.276 (2.865)	0.288 (0.786)	0.616 (1.787)	0.888 (2.794)
$W-L$	-0.637 (-1.384)	0.546 (1.151)	-0.113 (-0.329)	0.750 (1.907)	0.277 (0.815)	0.074 (0.267)
$J = 12$						
Winners	1.344 (3.460)	1.364 (3.539)	1.023 (2.689)	0.931 (3.371)	0.843 (2.796)	0.676 (2.427)
Losers	0.798 (1.684)	1.438 (3.091)	1.415 (3.086)	0.868 (2.940)	1.330 (3.053)	0.594 (1.733)
$W-L$	0.546 (1.151)	-0.074 (-0.150)	-0.392 (-0.855)	0.063 (0.289)	-0.459 (-1.076)	0.082 (0.267)

Note(s): This table reports the winners, losers and momentum portfolios. The loser (L) refers to the portfolio with the lowest return in the selected period, while the winner (W) refers to the portfolio with the highest return. Momentum portfolio ($W-L$) is the difference between winners and losers. For each portfolio, the table shows the portfolio's monthly return constructed following Jagadeesh and Titman (1993) on the basis of their past J periods where $J = 3, 6$ and 12 and holding the position for the next K periods where $K = 3, 6$ and 12 using a period of 246 months starting from January 1995. This forms a total of nine portfolios at the intersections between J and K . For instance, B_3K_3 is the strategy that is formed based on the returns of the previous three months and held for three after formation. Finally, the figures in parentheses are the t -statistics

Table A2.
Winners, losers and momentum return over 3–12 month horizons for above median beta stocks and below median beta in sequence

Table A3.
Winners, losers and momentum return over 3–12 months horizons for above median turnover stocks and below median turnover in sequence

	Above median turnover			Below median turnover		
	$K = 3$	$K = 6$	$K = 12$	$K = 3$	$K = 6$	$K = 12$
$J = 3$						
Winners	0.784 (2.350)	1.067 (3.366)	0.879 (2.747)	0.739 (2.370)	1.017 (3.581)	1.191 (4.524)
Losers	1.157 (2.750)	0.903 (2.375)	0.812 (2.148)	0.943 (2.244)	1.301 (3.847)	0.851 (2.752)
$W-L$	-0.372 (-0.981)	0.164 (0.569)	0.066 (0.287)	-0.219 (-0.483)	-0.285 (-0.834)	0.340 (1.382)
$J = 6$						
Winners	1.274 (3.973)	1.195 (3.665)	0.885 (2.943)	0.675 (2.162)	1.090 (3.588)	1.113 (3.799)
Losers	0.870 (2.085)	0.555 (1.400)	0.720 (1.773)	0.795 (1.928)	1.007 (2.805)	0.515 (1.578)
$W-L$	0.403 (1.000)	0.640 (1.791)	0.164 (0.511)	-0.069 (-0.150)	0.083 (0.205)	0.598 (1.897)
$J = 12$						
Winners	1.077 (3.314)	1.471 (4.636)	1.019 (3.237)	1.019 (3.045)	1.126 (3.455)	1.153 (3.752)
Losers	0.717 (1.520)	0.753 (1.821)	1.293 (2.918)	0.080 (0.226)	0.760 (2.021)	0.656 (1.817)
$W-L$	0.360 (0.772)	0.718 (1.901)	-0.274 (-0.715)	0.901 (2.054)	0.341 (0.784)	0.496 (1.246)

Note(s): This table reports the winners, losers and momentum portfolios. The loser (L) refers to the portfolio with the lowest return in the selection period, while the winner (W) refers to the portfolio with the highest return. Momentum portfolio ($W-L$) is the difference between winners and losers. For each portfolio, the table shows the portfolio's monthly return constructed following Jagadeesh and Titman (1993) on the basis of their past/periods where $J = 3, 6$ and 12 and holding the position for the next K periods where $K = 3, 6$ and 12 using a period of 246 months starting from January 1985. This forms a total of nine portfolios at the intersections between J and K . For instance, $J3-K3$ is the strategy that is formed based on the returns of the previous three months and held for three after formation. Finally, the figures in parentheses are the t -statistics

The current issue and full text archive of this journal is available on Emerald Insight at:
<https://www.emerald.com/insight/2444-8494.htm>

Agency costs and credit availability: an international study

Agency costs
and credit
availability

Mejda Bahlous-Boldi

*Finance, RIT, Dubai, United Arab Emirates and
IHEC, Carthage, Tunisia*

285

Abstract

Purpose – This paper aims to investigate the link between agency costs mitigation via three levels of rights protection (minority rights protection, enforcing contracts, resolving insolvency issues) provides the propitious climate for financing investment opportunities around the world.

Design/methodology/approach – We use Bartlett's three-group method to stratify countries based on how well they protect investors as measured by the scores provided in the Doing Business dataset developed by the world bank for 189 countries. We then test a variety of independent hypotheses that the alleviation of agency costs via three levels of protection (minority investors' rights, contract enforcement, resolving insolvency issues) is associated with better access to credit via the banking system, better valuation of listed firms via the stock market and higher investment and growth.

Findings – Our findings support Agency Theory which explains why the absence of legal protection of external investors leads to stock markets and financial institutions failing to fulfill their role of financing the economy.

Practical implications – The policy implication from this study indicates that countries ought to (1) develop legislation that protects investors' rights, (2) improve the quality of their judicial system in terms of enforcing the legislation and (3) build the framework for resolving disputes during insolvency as these are important ingredients for a developed financial system.

Originality/value – We use the World bank dataset and a new methodology to quantify the significance of the relationship between minority rights protection, ineffective enforcement, lack of bankruptcy laws and access to firm financing via the banking sector and the stock market. It provides new evidence that the quality of the judicial system in a country matter for firms' ability to raise financing and enhance value creation.

Keywords Agency Theory, Shareholders' rights protection, Enforcing Contracts, Bankruptcy Law, Minority Investors, Banking Sector development, Stock Market development

Paper type Research paper

Received 26 June 2020
Revised 22 February 2021
13 April 2021
Accepted 17 April 2021

1. Introduction

In the absence of strong standards of disclosure, surveillance and enforcement, the high agency costs related to the lack of transparency lead to losses for corporations and inhibit value creation. In the absence of collateral registry and of bankruptcy law, banks will be reluctant to lend to entrepreneurs with daring ideas, and investors will be reluctant to take any ownership interest in companies in need to raise capital to finance their growth. In this case, financial markets cannot play a major role in mobilizing savings and in providing funding to innovative projects.

This paper provides new evidence that poor minority rights protection, ineffective enforcement, and lack of bankruptcy laws is associated with limited access to the banking sector, lower firm valuation, and financing of investment opportunities via the stock market. Central to this issue, agency theory and asymmetry of information explain why in the

© Mejda Bahlous-Boldi. Published in *European Journal of Management and Business Economics*. Published by Emerald Publishing Limited. This article is published under the Creative Commons Attribution (CC BY 4.0) licence. Anyone may reproduce, distribute, translate and create derivative works of this article (for both commercial and non-commercial purposes), subject to full attribution to the original publication and authors. The full terms of this licence may be seen at <http://creativecommons.org/licenses/by/4.0/legalcode>

The author would like to thank external reviewers for their helpful comments.



European Journal of Management
and Business Economics
Vol. 31 No. 3, 2022
pp. 285-304
Emerald Publishing Limited
e-ISSN: 2444-8494
p-ISSN: 2444-8451
DOI 10.1108/EJMBE-06-2020-0175

absence of legal protection of outside investors, stock markets fail to fulfill their role of financing the economy. For instance, if capital providers are not protected from expropriation by controlling shareholders or by opportunistic managers as a result of the majority rule or centralized control, the temptation to take on perquisites and other private benefits will result in losses for the corporation and more for noncontrolling shareholders.

We use the Doing Business database developed by the World Bank to investigate the relationship between the legal business environment and firm financing via the banking channel and the stock market channel, as well as firm investment in 189 countries during 2003–2017. The indices are used to measure the extent of shareholder's protection, enforcing contracts, and resolving insolvency, as well as some indicators of availability of credit to the private sector, valuation of corporations and stock market liquidity in addition to Economic indicators. Our test concludes that in countries that protect better investors, lenders, and minority shareholders, more credit is available for corporations via the banking sector and stock market is more liquid and efficient.

This paper is organized as follows: Section 2 provides a literature review on agency costs and firm financing and the previous research linking the legal environment to a firm's access to financing. Section 3 presents our test of the relationship between access to financing and three aspects of creditor's rights protection: we focus on minority rights, quality of the judicial system and legislation that resolves insolvency issues. Section 4 concludes.

2. Agency costs and firm financing: literature review

When investment opportunities exist, underinvestment occurs, mainly because corporations are unable to obtain the amount and maturity of financing needed. Entrepreneurs cannot raise equity finance mainly because of microeconomic factors like asymmetric information and conflicts of interest between lenders and borrowers and macroeconomic factors like credit control policies and the legal and institutional environment in which corporations and financial institutions operate. In a situation where managers are more likely to have opportunistic behavior and engage in negligent behavior without prosecution, outside investors will be reluctant to provide the capital needed. In a situation where ownership is concentrated between the hands of few main shareholders, new investors will hesitate to take a minority position if there is a risk of expropriation. In a situation where financial intermediaries are unable to manage risk efficiently or to collect reliable information and monitor the use of funds by borrowers, lenders will be reluctant to provide long-term funds to those entrepreneurs whose risk is difficult to assess. (See (Ross (1973) for a comprehensive model of the theory of Agency).

Capital market imperfections like credit control and asymmetric information, as well as poor rights protection for capital providers, therefore, become sources of financing constraints that can lead to suboptimal level of investment and thereby hampers economic growth.

Perhaps the starting point of the extensive research linking the extent of the legal protection of outside investors to firm financing can be found in the seminal work by Nobel prize winners Jensen and Meckling (1976) in the theory of the Firm. According to them, agency costs include all costs frequently referred to as contracting costs, transactions costs, moral-hazard costs, and information costs. In their model, agency theory explains why maximizing the value of the firm is not necessarily optimal for all stakeholders. Jensen and Meckling explain in their conclusion that "*The growth in the use of the corporate form as well as the growth in market value of established corporations suggests that at least, up to the present, creditors and investors have by and large not been disappointed with the results, despite the agency costs.*"

Nevertheless, the failure of the cooperative form of society to accumulate and create wealth, which led to the end of the cold war in 1990, is precisely due to the general problem of

agency costs in the form of shirking, monitoring costs and losses incurred because of ineffective or inexistent incentives to work for the common good.

2.1 Agency conflicts

Three main conflicts arise from the separation of ownership, creditors and control. (1) Agency conflicts between shareholders and managers; (2) agency conflicts between minority shareholders and majority shareholders that could result in the expropriation of minorities by the ruling shareholders; and (3) agency conflicts between shareholders and creditors due either to moral hazard or due to the selfish behavior of shareholders in a likely situation of bankruptcy.

2.1.1 Agency costs resulting from conflict of interest between hired managers and shareholders. In this category, agency costs can be of three origins: first, losses incurred from the opportunistic behavior of managers who pursue their own goals at the expense of the shareholders will reduce the value of the firm. Second, limited access to information about how their wealth is managed creates risk for the shareholders and potential for being abused by the managers. Third, moral hazard, i.e. the tendency for the managers to undertake risky actions and to be less careful knowing that the potential burdens of such risks, if things go bad, will be borne by the shareholders adds to the business risk. Gormley and Matsa (2016) explain that the opportunistic behavior from the managers manifests itself not only in two value-destroying activities such as creating private benefits or exerting less effort than shareholders desire (shirking) but also in a third action motivated by risk aversion or career concerns. As a matter of fact, managers have the incentive to take on less risk than is desired that reduces the firm's risk, or in other words, "*playing it safe*" when it is not optimal to do so. This, often-ignored form of agency costs, is costly for the firm and for the economy as a whole as elucidated by the authors "*by preventing individual firms from taking risk, risk related agency conflicts could hamper aggregate investment and economic growth*" (Gormley and Matsa (2016) p. 432).

2.1.2 Agency costs resulting from the conflict of interest between minority shareholders and majority shareholders. In case the ownership is concentrated, a conflict of interest is likely to exist between controlling shareholders who possess the majority of interest and commensurate voting rights and the minority noncontrolling shareholders. The oppressive actions of controlling shareholders include but are not limited to withholding dividends, asset sale, mergers, compensation and perks to majority shareholders that are employees, and other self-interested discriminatory actions (Farrar and Boule, 2001). La Porta *et al.* (1998) claim that in countries "with poor legal protection of outside investors, ownership concentration is a substitute for legal protection" because investors are not willing to take minority positions as they are more likely to be expropriated. Burkart and Panunzi (2006) argue that legal protection, same as monitoring, weakens managerial incentives to divert shareholders' wealth. Their model shows that legal protection can either complement or replace ownership concentration. Here again, legislation is needed to ensure that minority rights are protected. Without it, the company cannot raise equity capital easily.

2.1.3 Agency costs resulting from the conflict between shareholders and creditors. In this case, the creditors are principals, while the company, its shareholders, and managers, are agents. The losses for the creditors result from three situations: first, the absence of good and effective legislation that protects creditors from being expropriated due to moral hazard arising from the fact that the fund provider has no control over the use of funds lent and the degree of risk taken by the fund managers, creditors will be reluctant to provide the funds needed. Second, absent collateral registry, lenders cannot rely on companies' assets to be used as collateral for a bank loan. Third, in a situation of bankruptcy, the creditors are the owners

of the assets that are still managed by managers who were hired to pursue the goal of maximizing shareholder's wealth. Managers in this situation will act in the interest of the shareholders and not the creditors who are owners of the distressed firm current assets. In this case, the creditors need protection from the abusive behavior of the managers and the shareholders. The 2008 financial crisis, as well as the 2020 current health crisis, have brought into the spotlight the need for bankruptcy law as many firms were forced into financial distress or bankruptcy. If financially distressed firms can be saved from liquidation, efficient bankruptcy laws will encourage reorganization and protect creditors from further losses. On the other hand, firms that cannot benefit from reorganization should be liquidated and money returned to creditors. Gine and Love (2010) explain that an effective Bankruptcy regulation should seek to minimize reorganization costs, ensure that viable firms are reorganized and unviable firms are liquidated, support speedy recovery of reorganized firms and therefore benefit financial and economic development. Good bankruptcy law that constrains managers to limit the potential for abuse of creditors' interest is a requirement for raising money via debt financing.

2.2 How can agency costs be reduced?

Two types of strategies are generally put forward that intend to act as a deterrent from taking these harmful actions for the principal: contractual governance strategies and regulatory strategies and their enforcement (Armour *et al.*, 2009).

- (1) Contractual strategies include a code of conduct that constrains the managers to act honestly and in good faith and reward and incentive strategies that could induce managers to comply with the rules and act in the best interest of the shareholders. Many of these strategies are, however, not found to be always effective and are paradoxically benefiting more the sinful agent than the principal victim as they lead to excessive management compensation or generous packages like golden parachutes benefiting the incompetent managers in case of a takeover.
- (2) Regulation in the form of corporate and securities laws aiming to reduce asymmetry of information imposes responsibilities on managers. For instance, the disclosure requirement imposing regular release of quality information about the company's performance, audited financial statements, the requirement of shareholders' approval for major decisions, holding annual shareholders' meetings, etc.
- (3) In addition to corporate law, bankruptcy law is also needed to protect both shareholders and creditors when the business is experiencing financial distress or liquidation. An efficient bankruptcy proceeding saves costs to the business, the stakeholders and the economy by encouraging reorganization for viable firms and the liquidation of unviable firms.
- (4) Although laws and regulations are necessary, they are not sufficient. For instance, if breaching the law does not lead to prosecution, then the legislation will not protect outside investors. There must be enforcement mechanisms that accompany the legislation for this legislation to be effective. When regulatory practices are based on the rule of law and the court system is fast and efficient, the regulation becomes effective in protecting investors and lenders. Therefore, enforcing the rule of law is a gauge of the quality of the judicial system.

2.3 Previous research on the investors' legal protection and firm financing

Several empirical studies suggest a positive link between legal protection and financial market development. According to these studies, better shareholders' protection would

lead to more efficient financial markets and to higher firm financing in the form of equity capital. For instance, La Porta *et al.* (1997) show that better legal protection is associated with stock markets that are more valuable and a larger number of listed firms. Kumar *et al.* (1999) argue that firms tend to prosper and to have larger listed firms in terms of their sales to assets in countries with better legal protection. Claessens *et al.* (2000) and La Porta *et al.* (2002) show that a higher valuation of listed firms relative to their assets is associated with a better legal environment. La Porta *et al.* (2000) also document greater dividend payouts in countries with better legal protection of outside investors. La Porta *et al.* (1998), and Claessens *et al.* (2002) conclude that good investors' protection is associated with less potential for shareholder expropriation as there is a lower concentration of ownership and control and lower private benefit of control (Dyck and Zingales (2004)). Zingales (1994), Nenova (1999) and Wurgler (2000) document a strong correlation between shareholders' protection and investment opportunities. Love (2003) shows that the sensitivity of investment to cash flow depends negatively on financial development, which suggests that in countries where the financial system is underdeveloped, companies can only invest if they generate enough cash flow. An underdeveloped financial system is usually characterized by poor legal shareholders' protection (Shleifer and Wolfenzon (2002)). In a recent study, Burunciuc and Gonenc (2021) used a dataset from the Doing Business database developed by the World Bank to identify 65 countries that undertook reforms protecting minority shareholders and investigate the impact of these reforms on firms operating in these countries. They provide evidence of a positive and significant impact of reforms that protect minority shareholders on the firm value measured by Tobin's Q and on firm's performance.

Carlin and Mayer (2003) show that the characteristics of industries that prosper in a country depend on the efficiency of the financial system in that country. Beck *et al.* (2005) investigated whether the financial, legal, and corruption obstacles that firms report affect their growth rates. They conclude that the legal environment is one of the factors that impact firms' growth. Armour *et al.* (2008) test the link between increased shareholders protection and stock market development using stock market capitalization, the value of stocks traded and the number of listed firms and concluded that there is no evidence of a long-run impact of legal change on stock market development. Berdugo and Hadad (2009) propose a model in which legal investors' protection in the high-tech industry mitigates agency problems between investors and innovators and leads to higher productivity and growth. They predict a high correlation between legal investors' protection and the size, productivity, and growth of the high-tech industry. According to this study, better investor protection facilitates the access to nonbank finance and enhances entrepreneurship. Deakin *et al.* (2018) use a recently constructed dataset to test the hypothesis that the strengthening of shareholder rights during the mid-1990s and 2000s in 28 developed and emerging countries promoted stock market development in those countries. They report a weak evidence that shareholder protection promoted stock market development. They found stronger evidence of a reverse relationship and conclude that at the county level, the stock market development caused a change in the legal environment which was the response to better shareholders' protection.

Safavian and Sharma (2007) used firm-level data to test the hypothesis that the effectiveness of creditor rights is strongly linked to the efficiency of contract enforcement in 27 European countries. They found a strong association between access to bank credit and creditor's rights in countries with better creditors' rights. The association is much weaker in countries with inefficient courts. Several institutions, among them the World Bank and the IMF, have advised developing countries on the importance of the "Rule of Law" to promote investment and wealth creation.

Ponticelli and Alencar (2016) show that in Brazil, a bankruptcy reform and better enforcement increasing secured creditors' protection, led to better access to finance and a

larger increase in investment and output. Neira (2019) provides evidence from a sample of OECD countries that an efficient bankruptcy framework is associated with a higher proportion of new bank loans allocated to large firms and better productivity of these firms.

Even in countries that are supposed to protect creditors, like the USA, through Chapter 11 of bankruptcy code, court decisions may be inefficient and not beneficial to creditors as it is supposed to be. Antill (2020) shows that the court ruling for a liquidation and asset sale instead of emergence, and reorganization, in many cases, is detrimental to creditors. The author finds that these costly liquidations lead to reduced creditor recovery by 14 cents per dollar of debt. The study also concludes that in 21% of liquidation cases, the ruling does not maximize creditors' recovery. They note that equity holders, for instance, would benefit from protecting creditors as it would lead to a lower cost of capital for the firm (Antill and Grenadier (2019)). Other recent studies suggest that suboptimal court rulings in favor of liquidation that are harmful to creditors are more likely to exist in areas with low access to credit Bernstein *et al.* (2019a, b).

3. Empirical investigation of the relationship between legal protection and firm financing

3.1 Data

In this study, we aim to assess the relationship between the legal framework for protecting investors and the financial market's depth, growth and liquidity. For this purpose, we used the indices from the *Doing Business Database* that measure the quality of the legal system in 189 countries. From our knowledge, the *Doing Business Database* is the only one available that provides quantitative indicators on business regulations to measure the extent of investor rights level of protection, contract enforcement and resolving insolvency individually in a way that allows for a direct test of our hypothesis. Also, it allows for comparison between 189 economies as the same methodology of administering the survey and constructing the indicators is used across countries. However, although this survey exists since 2003, many of the indicators have only a few observations over time, making the data set an unbalanced time series. Also, some countries have started being covered by the World bank survey only in the most recent years.

To test the hypothesis that the legal environment in which businesses operate matters for the availability of credit via the banking sector, the liquidity and depth of the stock market, and for firm investment and growth, two sets of data are needed: indicators of the quality of the legal environment and indicators of firm access to credit and equity finance.

3.1.1 Investors' legal protection indicators. Outside investors need three levels of protection: (1) laws that prohibit negligent and opportunistic behavior by the agent, (2) mechanism of enforcing the regulation and (3) procedures and laws aiming to resolve insolvency issues. If improving the legal environment by ensuring the rule of law in business dealings leads to better financing of the economy and of the corporate sector, then we can conclude that a better legal environment can enhance wealth creation and reduce poverty. The "Doing Business" dataset from the World Bank provides indicators for two aggregate measures of the quality of the legal environment. More specifically, some of these indicators measure three aspects of the business environment that are of interest here: protecting minority investors, enforcing contracts, and resolving insolvency.

Protecting investors: as explained by the Doing Business report, investors' protection indicators assess the regulation in protecting investors and shareholders first from conflict of interest and second in protecting rights in corporate governance.

- (1) PMI-SMIP Strength of Minority Investor Protection Index is the average of the PMI-ECIR and PMI ESG.

The Extent of conflict-of-interest regulation index PMI - ECIR (0–10) assesses the transparency, disclosure requirement, and company's director liability in cases of self-dealing and mismanagement of company's affairs available starting from 2014. This is the new version of PMI-SIP (Strength of Investor Protection Index) available from 2006 until 2014. More precisely, PMI - ECIR is the average of the following indicators:

- (2) PMI-ED Extent of disclosure index measures *Approval and transparency of related-party transactions*.
- (3) PMI -ESS Ease of shareholders' suit: *Liability of company directors for self-dealing*.
- (4) PMI-EDLI Extent of Director Liability: *Shareholders' ability to obtain corporate documents before and during derivative or direct shareholder litigation*.

The rights in corporate governance are assessed through the PMI-ESG indicator that measures the role of shareholders in major corporate decisions, their protection from undue board control and entrenchment, and the level of transparency in matters related to executive compensation, annual meetings, and audits. The higher the values the better is the shareholder's protection.

- (5) The PMI ESG (Extent of shareholder governance index 0–10) index is calculated as the average of the following indexes.
 - PMI-ESR (Extent_of_shareholder_rights_index_0–10) measure rights and roles in major corporate decisions.
 - PMI-EOC (Extent_of_ownership_and_control_index_0–10) measures Governance safeguards protecting shareholders from undue board control and entrenchment.
 - PMI-ECT (Extent_of_corporate_transparency_index_0–10) measures Corporate transparency on significant owners, executive compensation, annual meetings and audits.

Enforcing contracts: As described by the World Bank report, the enforcing contract index measures the extent of the efficiency of the regulatory practices in enforcing the rule of law. This indicator focuses on the efficiency of the commercial court system and the quality of judicial processes in the country. It is based on the procedures, time and cost to resolve a commercial dispute between two firms through the courts (World Bank report on protecting investors).

- (1) EC -TD Time in Days to resolve a commercial dispute through a local first-instance court (the lower the better).
- (2) EC - C Attorney, Court and enforcement costs as % of claim value (lower is better).
- (3) EC-CE Attorney fees, court costs and enforcement cost as % of estate (lower is better).
- (4) EC-P Number of procedures needed to resolve a commercial dispute by enforcing a contract. (The lower, the better).

Resolving Insolvency: The third level of protection is related to stakeholders' rights in a situation of financial distress. In countries where bankruptcy laws are inexistent or inefficient, losses to all parties, as well as to the economy in terms of jobs lost and the impact on distressed families, can have far-reaching implications. Creating a framework to help distressed firms find a way for reorganization and saving the business from bankruptcy when it is still viable or helping in liquidating nonviable firms to prevent further losses is

expected to have a positive impact on the ability of firms to raise funds and to invest. The resolving insolvency indicator of the World Bank measures the time, cost, outcome and recovery rate for commercial insolvency and strength of the legal framework for insolvency (World Bank report on protecting investors).

- (1) RI - SI: Strength_of_insolvency_framework_index_0-16_ is an aggregate measure of the quality of insolvency laws that govern relations between debtors, creditors, and the court. The higher this index, the more advantageous is the treatment of debtors.
- (2) RI - RR: Recovery rate cents on the dollar is the number of cents to the dollar recovered by secured creditors through judicial reorganization, liquidation, or debt enforcement proceedings (the higher, the better). It considers the outcome, the time and the costs of proceedings during reorganization or liquidation. (World Bank Doing Business Report).
- (3) RI - CE: Cost as Percent of Estate (the lower, the better).
- (4) RI - CP: Creditor Participation Index_0-4.
- (5) TRI- Time to resolve insolvency in years (the lower, the better).

For each one of these levels of protection, the World Bank also calculates an index based on the ranking of each country relative to the lowest protection in the group of countries (frontier). These resulting indexes are the Distance to Frontier Indexes (DTF); the higher any of these indexes, the better is the protection of rights. We used the four DTF indexes and two more indicators LGRI and DCI (Depth of credit information index (0 = low to 8 = high), which *measures rules affecting the scope, accessibility, and quality of credit information available through public or private credit registries* (Source: World Bank, Doing Business project) and the Strength of legal rights protection LGRI Strength of legal rights index measures the degree to which collateral and bankruptcy laws protect the rights of borrowers and lenders. The index ranges from 0 to 12, with higher scores indicating that these laws are better designed to expand access to credit.:

- (1) PMI_DTF Protecting Minority Investors; Distance to Frontier.
- (2) EC_DTF Enforcing Contracts; Distance to Frontier.
- (3) RI_DTF Resolving Insolvency; Distance to Frontier.
- (4) ALL_DTF All three levels of protection: Distance to Frontier.
- (5) DCI (Depth of credit information index (0 = low to 8 = high)).
- (6) LGRI Strength of Legal rights Index (0 = low to 12 = high).

3.1.2 Firm financing indicators. To assess the ability of investors and the business sector to access to credit and financing, we have three sets of indicators related to the banking sector development, stock market development and economic activity indicators:

3.1.2.1 Credit and banking sector efficiency Indicators.

- (1) **Domestic Credit to the private sector as a % of GDP (DCPS)** refers to financial resources provided to the private sector by financial corporations, such as through loans, purchases of nonequity securities, and trade credits and other accounts receivable, that establish a claim for repayment. For some countries, these claims include credit to public enterprises. The financial corporations include monetary authorities and deposit money banks, as well as other financial

corporations where data are available (including corporations that do not accept transferable deposits but do incur such liabilities as time and savings deposits). Examples of other financial corporations are finance and leasing companies, money lenders, insurance corporations, pension funds, and foreign exchange companies [1].

- (2) **DCB Domestic Credit to the private sector by Banks as % of GDP (DCB)** is defined as financial resources provided to the private sector by other depository corporations (deposit taking corporations except central banks), such as through loans, purchases of nonequity securities, and trade credits and other accounts receivable, that establish a claim for repayment. For some countries, these claims include credit to public enterprises.
- (3) **Domestic Credit provided by financial sector as % of GDP (DCP)**: It includes all credit to various sectors on a gross basis, except for credit to the central government, which is net. The financial sector includes monetary authorities and deposit money banks, as well as other financial corporations where data are available (including corporations that do not accept transferable deposits but do incur such liabilities as time and savings deposits).
- (4) **Gross Domestic Savings as % of GDP (GDS)** is calculated as GDP less final consumption expenditure. It is intended to measure the total savings of the household sector, private corporate sector, and public sector. We expect to find a positive and significant link between GDS and the measures of the quality of the judicial system, as well as protecting investors and resolving insolvency issues.

3.1.2.2 Stock market functioning and its extent to finance the corporate sector.

- (1) **Market Capitalization of listed companies (Log-MC)**: this variable is meant to measure the total value of companies listed, our hypotheses are that in a business environment with better rights protection laws and a more efficient judicial system that enforces contracts and better functioning of bankruptcy administration, firms have a higher valuation. This indicator of the size of the stock market is calculated by the sum of the market capitalization of all listed companies in current USD (number of stocks of each company multiplied by its stock price). We use the log transformation of market capitalization to make the mean independent of the SD.
- (2) **Market Capitalization as % of GDP (MC)**: measures the market capitalization of all listed companies as a % of GDP. It helps assess the value of the shares traded per dollar generated in GDP. We expect this indicator to be higher in countries with better indicators of the legal environment.
- (3) **Stocks Traded Turnover Ratio of Domestic shares (STT)**: is the value of domestic shares traded divided by their market capitalization. It measures the liquidity of the stock market. A high turnover is an indication of well-functioning stock market and better valuation of corporations. Our hypothesis is that a good legal system is needed for a well-functioning stock market.
- (4) **Stocks Traded, total value as % of GDP (STTV)**: This variable is the value of shares traded measured as the total number of shares traded, both domestic and foreign, multiplied by their respective matching prices of their end of year value divided by GDP. We expect to find a positive association between this variable and indicators of the quality of the legal environment.

3.1.2.3 Economic activity, investment, and value creation indicators.

- (1) **Gross capital formation in constant 2005 US\$:** (Log-GCF): represents the outlays on additions to the fixed assets of the economy plus the changes in the level of inventories. This variable is often used to measure the growth of the economy along with the Gross Domestic Product. We used the the log form of this indicator and expected this indicator to be positively and significantly associated with good legal environment indicators. We use the log transformation of GCF to make the SD independent of the mean for the variables that are dollar amounts.
- (2) **Gross Capital formation as % of GDP (GCF as % of GDP)** GCF is defined above but is scaled by dividing it by the GDP of the country.
- (3) **Gross Fixed Capital Formation % of GDP (GFCF/GDP)** is the gross domestic fixed investment that includes land improvements plant, machinery and equipment purchases.
- (4) **GDP-AG is** the GDP annual growth in Pct meant to measure the annual economic growth and wealth accumulation. Our hypothesis is that high economic growth countries are not necessarily those that protect their investors better.
- (5) **Gross value added at factor cost constant 2005 (GVAFC)** is the value of output less the value of intermediate consumption.
- (6) **Manufacturing Value added as % of GDP (MVA-Asin)** measuring the extent of wealth creation from the manufacturing sector. We used the Asin transformation to make the data normally distributed.

3.2 Methodology

The hypothesis to test in this study is that the legal environment in which businesses operate matters for the liquidity and depth of the stock market, the availability of credit in the banking sector and economic activity and growth.

To unravel the relationship between access to credit and shareholders' legal rights protection, we use a *T*-test of the significance of the difference between the means of the financial indicators of different countries with different levels of investor protection. Because the number of indicators that we are dealing with is relatively high (20 indicators of investor's rights protection and 14 indicators of financial development), and that the dataset is an unbalanced time series, we start by grouping the countries based on their level of investor protection indicators. First, for every country, we compute the average over all years of every rights protection indicator. Second, for every indicator, we rank the countries based on the calculated indicator average. We then divide the countries into three groups of high investor protection, low investor protection and medium investor protection indicator. This procedure is known as Bartlett's three-group method (see Bartlett (1949)) that focuses only on the comparison of the financial indicators between the high investor indicator group and the low investor indicator group of countries. This grouping was repeated 20 times as we have 20 investor protection indicators. The next step is to test if there is a significant difference between the means of the financial indicators of the low investor protection group and the high investor protection group. To do this, we use a hypothesis testing as follows:

Let \bar{X}_h represent the population mean of one financial indicator of the high investor legal protection group and \bar{X}_l represent the population mean of a financial indicator of the low investor legal protection group.

$$H_0: \bar{X}_h = \bar{X}_l \text{ or } H_0: \bar{X}_h - \bar{X}_l = 0.$$

$H_a: \bar{X}_h > \bar{X}_l$ or: $H_a: \bar{X}_h - \bar{X}_l > 0$.

We use a T -test for two population means with two unknown population variances and calculated the following statistic:

$$t = \frac{\bar{X}_h - \bar{X}_l}{\sqrt{\frac{S_h^2}{n_h} + \frac{S_l^2}{n_l}}}$$

where:

- (1) S_h^2 is the variance of the financial indicator of the high investor protection group.
- (2) S_l^2 is the variance of the financial indicator of the high investor protection group.
- (3) n_h and n_l are the group sizes (number of observation years times countries).

The T -test was repeated 280 times (14 financial and economic indicators x 20 legal protection indicators).

If there is no association between the financial development indicator and investor protection variables, then the average value of the financial development indicator should not differ among the groups characterized as having low or high investor protection indicator and $\bar{X}_h - \bar{X}_l = 0$ cannot be rejected, and the value of the T statistic should be statistically insignificant.

We used the p -values to decide whether the t value is significant or not because the degree of freedom differs for different indicators due to the unbalanced dataset. However, we chose to report the t values as they display the sign of the association, which is useful information. The p -values are also provided in the summary table in Table A1.

For example, we consider the relationship between the variable *Protecting Minority Investors distance to frontier index* (PMI DTF) in Table 1, and the variable measuring the extent of the banking sector to finance the private sector DCB. Table 1 shows that the T -test gives a value of 6.17 for this association which is positive and significant at the 0.001 probability level. The degrees of freedom represent the number of observations (number of countries times the number years for which we have an indicator) minus 2.

3.3 Results

We organize our results in three sections first, we focus on the PMI indicators; second, we focus on the aspect of enforcing contracts and last, we discuss the relevance of bankruptcy laws.

3.3.1 Does investors' rights protection matter? In Table 1, we report the results of the association between the PMI indicators and (1) the credit available via the banking sector (DCPS, DCB and DCP), and (2) the extent of the stock market to finance the corporate sector (STT, STTV, Log-MC and MC) and (3) some economic growth variables (Log-GCF, GCF, GFCF, GDP-AG, GVAFC and MVA). The *** indicates a significance level of more than 99.9 % which means that the probability that the means of the two groups are equal is less than 0.1%. The ** indicate a significance level of more than 99% and a * indicates a significance level of more than 95%.

Access to Credit: Our results suggest clearly a positive and highly significant relationship between variables that measure the availability of domestic credit to the private sector, by financial corporations (banks, nonbanks, trade finance and other financial nonequity corporations) (DCPS) and by Banks (DCB) and by all financial institutions (DCP) to finance the private sector and the indicators that measure the extent of investors' rights protections as measured by all the PMI indicators. Also, we note a positive and significant

	PMI_DTF	PMI_SMIP	PMI_SIP	PMI_ESS	PMI_EDLI	PMI_ED	PMI_ECIR	PMI_ESG
<i>Availability of financing via the Banking Sector</i>								
DCPS	6.42***	4.45***	6.63***	3.85***	4.84***	2.90**	4.45***	4.39***
DCB	6.17***	4.19***	6.32***	3.57***	4.73***	2.75**	4.28***	4.39***
DCP	5.71***	4.64***	5.81***	3.37***	4.69***	2.34*	3.55***	4.34***
GDS	2.39*	1.31	2.34*	-0.88	2.55*	2.84**	0.77	1.07
<i>Availability of financing and firm valuation via stock market</i>								
STT	2.00*	0.18	1.57	-0.78	-0.20	2.46**	-0.18	-0.08
Log MC	3.39***	2.29*	3.23**	-0.12	1.70	6.08***	1.52	1.58
MC/GDP	2.25*	1.66	2.10*	1.01	3.48***	1.88	1.61	-0.02
STTV	2.10*	1.11	1.66	0.44	1.83*	2.04*	1.27	-0.61
<i>Capital accumulation and investment</i>								
Log GCF	6.08***	4.15***	5.84***	1.90	3.48**	3.53**	3.55**	5.26***
GDP-AG	2.02*	1.25	2.42*	1.13	1.58	-0.99	1.39	1.21
GCF/GDP	1.16	-1.56	0.85	-1.82	0.47	1.93	-0.84	-1.54
GFCF/GDP	0.99	-2.15*	0.57	-2.55*	0.44	1.39	-1.29	-2.08*
Log	2.94**	5.92***	2.61**	0.64	1.46	4.12***	2.02*	6.85***
GVAFC								
asin_MVA	1.04	2.19*	0.80	0.44	0.60	-0.21	0.46	3.53***

Note(s): The *** indicates a significance level higher than 99.9 %, which means that the probability that the two groups' means are equal is less than 0.1%. The ** indicate a significance level higher than 99%, and a * indicates a significance level higher than 95%. Refer to Section 3.1 for variables definitions

Table 1.
Minority investors' rights, banking sector, stock market and economic indicators

relationship between the extent of banks to finance the private sector and the extent of investor protection indicators. This is strong evidence that investors' protection matters for the banking sector to fulfill its role of financing the corporate sector.

Valuation of traded companies and access to financing via the stock market:

The extent of the stock market to finance the economy as measured by the variables Stocks traded Turnover ratio (STT) and the value of stocks traded as % of GDP (STTV), as well as by market capitalization as a % of GDP (MC) and Log of Market capitalization is also significantly related to the legal rights protection indicators. All these variables show a positive and significant association with the PMI DTF, the Extent of disclosure index (PMI_ED) and the extent of the director liability index (PMI-EDLI). The strength of investor protection and extent of minority shareholders protection indexes are also associated with higher market capitalization and hence with a better valuation of listed companies. Therefore, we can already conclude that two variables related to the regulation in terms of disclosure requirement and director liability, in cases of litigation between shareholders and directors, do matter for the liquidity of the stock market and for availability and valuation of equity capital for firm financing. Our results represent evidence of a strong positive association between the extent of investors' protection and firm access to finance.

Investment and Value added by the corporate sector: The results are less obvious for the economic growth indicators. Only Gross capital formation (GFCF) and Gross value added (GVAFC) that measures the addition of fixed assets (capital investment) and wealth accumulation from the manufacturing sector are positively and strongly associated with indicators of protecting investors' rights as measured by the PMI indexes. In fact, GDP growth does not seem to be higher for countries that protect their investors better. This result is expected as many high-growth wealthy countries do not provide legal protection to outside investors and minority shareholders or creditors. This result supports findings by Roe and Siegel (2013) suggesting that for financial development to be translated into economic

growth, other factors like political stability matter to create an ecosystem conducive to value creation and economic equality.

The legal environment matters for the banking sector to be efficient and for the stock market to be creating value for investors, but our evidence suggests that high economic growth countries are not necessarily those who protect their investors the best.

3.3.2 Does the quality of the judicial system matter? Access to Credit via the Banking and non-Banking Sector: Table 2 presents the results of the test of the relationship between the quality of the judicial system measured by the enforcing contracts indicators and the extent of the banking sector and other financial institutions to finance the private sector, as well as the Gross Domestic savings. Our results show that all indicators of the availability of credit to the private sector are significantly associated with better enforcing contracts indexes. All variables measuring the time in days it takes to enforce a contract EC-TD cost as % of claim EC - C and as % of estate EC-CE, and the number of procedures involved to enforce contract EC-P are all negative and significant (the lower, the better). They have not only the right sign as the association is negative as expected but they also are highly significant. This result means that the longer the time of contract enforcement, the lower the availability of credit to finance the business environment.

Valuation of traded companies and access to financing via the stock market:

As expected, our results show a negative and significant relationship between the stock market development indicators and the enforcing contracts indicators. Moreover, the Distance to frontier index Enforcing Contracts DTF index is positively and significantly linked to financial development indicators that measure the availability of credit to finance the private sector, as well as the stock market liquidity and valuation of listed companies. All other indexes measuring the cost and time of enforcing the contract in an economy have, as expected, a negative association with stock market liquidity and the valuation of companies listed.

Investment and Value added by the corporate sector: Table 2 also highlights that all enforcing contract indicators are linked to better investment (as measured by the variable

	EC_DTF	EC_TD	EC_C	EC_P
<i>Availability of financing via the Banking Sector</i>				
DCPS	6.11***	-3.91***	-4.26***	-4.81***
DCB	5.93***	-3.55***	-4.52***	-4.42***
DCP	6.52***	-4.10***	-4.75***	-4.44***
GDS	4.65***	-2.62**	-4.85***	-2.21*
<i>Availability of financing and firm valuation via Stock market</i>				
STT	3.80***	-2.95**	-2.57*	-2.59*
Log-MC	5.06***	-2.33**	-2.86**	-6.16***
MC/GDP	3.68***	-1.54	0.42	-5.30***
STTV	4.60**	-3.42**	-1.24	-5.06***
<i>Capital accumulation and investment</i>				
log_GCF	7.62***	-2.65**	-7.94***	-6.55***
GDP-AG	3.56***	-3.13**	-1.23	-1.84
GCF/GDP	3.48***	-3.30***	-1.67	-1.60
GFCF/GDP	4.44***	-4.05***	-2.08*	-0.81
Log_GVAFC	7.76***	-3.67***	-7.49***	-6.73***
asin_MVA	4.53***	-0.70	-3.50***	-4.89***

Note(s): The *** indicates a significance level of more than 99.9 %, which means that the probability that the means of the two groups are equal is less than 0.1%. The ** indicate a significance level of more than 99%, and a * indicates a significance level of more than 95%. Refer to Section 3.1 for variables definitions

Table 2.
Enforcing contracts
indicators and
availability of
financing

GCF), and to a higher value, added by the manufacturing sector, as measured by both GVAF and MVA. This is a very interesting result as it provides strong evidence that efficient contract enforcement is crucial to the enhancement of corporate investment in fixed capital and the value creation by the manufacturing sector to the economy.

Overall, our results represent a strong evidence that the quality of the judicial system that ensures the fairness and efficiency of judicial courts and the rule of law is a strong and positive determinant of firm's access to credit via bank and nonbank financial system and via the stock market, as well as with firm investment through capital accumulation. This result corroborates the finding by Safavian and Sharma (2007), who conclude that "while strengthening creditors rights, increases credit to firms, the payoffs from reforming these rights is lower in countries where the enforcement system functions poorly."

3.3.3 Does protecting creditors' rights during insolvency matter for financing the corporate sector? When corporations and businesses are in a situation of insolvency and financial distress, are creditor's rights protected? This is an important information for the availability of credit finance to the business sector. The efficiency of the insolvency framework will safeguard a high creditor's recovery rate of their capital in the event of financial distress and insolvency.

Access to Credit: The third level of protection is related to resolving disputes that arise in a situation of insolvency. Table 3 reports the results of the test of the association between resolving insolvency indicators and the availability of credit via the banking sector and the stock market activity. The results show a significant association between the availability of credit via bank and nonbank financial institutions for firm financing in the private sector. All indicators show a strong and positive link at least at the 1% significance level with the resolving insolvency indicators. This is particularly important as it confirms that the existence of bankruptcy law and a good and efficient bankruptcy administration is associated with better access to credit. When Creditors are ensured of the recovery of their capital in a situation of insolvency, they are more inclined to lend and finance the corporate

	RI_DTF	RI_SI	RI_RR	TRI	RI_CE
<i>Availability of financing via the Banking Sector</i>					
DCPS	5.25***	2.63**	5.25**	-2.23*	-3.86***
DCB	5.37***	2.45**	5.37**	-2.09*	-4.16***
DCP	4.50***	2.64**	4.50**	-1.62	-3.46***
GDS	5.11***	2.42**	5.11**	-2.01*	-2.78**
<i>Availability of financing and firm valuation via Stock market</i>					
STT	3.56***	2.24*	3.56**	-0.98	-1.84
log_MC	5.38***	3.39**	5.38**	-0.53	-4.35**
MC	4.22***	1.22	4.22**	-2.36*	-2.55**
STTV	5.48***	2.44*	5.48**	-1.74	-4.58**
<i>Capital accumulation and firm investment</i>					
log_GCF	8.51***	5.10***	8.51**	-2.74**	-5.40**
GDP_AG	2.87**	1.13	2.87**	0.01	-1.37
GCF/GDP	0.98	-1.79	1.08	-0.49	-1.08
GFCF/GDP	0.58	-1.58	0.58	0.60	-1.05
log_GVAF	7.77***	6.10***	7.77***	-2.07*	-5.24**
asin_MVA	3.65***	3.90***	3.65**	-1.63	-2.08**

Table 3.
Efficiency of resolving insolvency framework, banking sector development and stock market activity

Note(s): The *** indicates a significance level of more than 99.9 % which means that the probability that the means of the two groups are equal is less than 0.1%. The ** indicate a significance level of more than 99%, and a * indicates a significance level of more than 95%. Refer to section 3.1 for variables definitions

sector. Gross Domestic savings is also significantly associated with all resolving insolvency framework indicators and has the correct sign. An efficient bankruptcy system brings trust and transparency into the process of firm financing via debt. It signals less potential for expropriation of creditors in the event of insolvency, who would more likely agree to finance the firm. Financial transactions would be impossible if creditors were not assured of getting their money back. Our results give support to Gine and Love (2010) studied the reforms in bankruptcy laws in Colombia and provided evidence that firms who are potentially viable are better off being reorganized and benefited from a speedy recovery which ultimately was beneficial to creditors.

Valuation of traded companies and access to financing via the stock market:

Our results also confirm that the liquidity of the stock market (STTV, STT) and valuation of listed firms (log of MC) are significantly linked to the indicators that measure the extent of resolving insolvency issues. Also, the association is negative when it comes to indicators that measure the time and procedures to resolve insolvency issues, as the lower these indicators are, the better the resolving insolvency framework.

If a bankruptcy regime can separate those firms that should be saved by allowing reorganization from unviable firms that should be liquidated and money returned to creditors, it will translate into a better valuation of viable firms and better opportunities for growth. Our result represents evidence that the valuation of listed firms, stock market liquidity and depth in a country are shaped by the quality of the insolvency framework. Countries should engage in continuously reforming their bankruptcy system as it positively impacts access to credit and creates better opportunities for growth.

More than ever before, bankruptcy laws are needed as the current pandemic is fragilizing millions of businesses around the world whose fate depends on the efficiency of the insolvency framework.

Investment and Value added by the corporate sector: An interesting result is that there does not seem to be any significant relation between resolving insolvency issues and GDP growth rates. Only variables measuring firm capital investment and the total wealth created by the manufacturing sector (GCF), (GVAFC) and MVA, seem to be impacted by the Resolving Insolvency measures put in place in a country. This represents another evidence that the bankruptcy framework matters for the business sector to fulfill its goal of economic wealth and value creation via better financing opportunities, higher job creation and growth prospects.

Last, when lenders cannot access information about potential borrowers, they will be reluctant to lend to entrepreneurs with daring and innovative ideas, which hampers growth. The banking sector development relies on the availability of timely, relevant, and credible information about customers for it to allocate credit efficiently and finance the corporate sector. For this purpose, we also test the significance of the association between DCI (Depth of Credit Information) and the banking sector activity. We expect the variable DCI to be significantly associated with the access to credit via the banking sector. Our results in Table 4 confirm that the depth of credit information (DCI) is a determinant of all measures of availability of credit to the private sector through banks and nonbank financial institutions.

As expected, DCI is not significantly associated with the valuation of firms or with the functioning of the stock market as none of the stock market activity indicators is significant at the 5% level. However, we document a significant link between the indicator DCI and all measures of value added by the manufacturing sector and investment of the corporate sector (GFCF, GFC and MVA). This is another evidence that the depth of credit information positively impacts value creation and productivity as it facilitates access to financing.

The other indicator tested is LGRI (Strength of Legal rights Index) which is a measure of the degree to which collateral and bankruptcy laws protect the rights of borrowers and lenders. We expect the LGLR indicator to be significantly associated with the banking sector

	ALL_DTF	DCI	LGLR
<i>Availability of financing via the Banking Sector</i>			
DCPS	6.16**	3.61**	1.22
DCB	6.18**	3.98**	1.34
DCP	5.37**	3.71**	0.53
GDS	3.81**	2.38**	-1.47
<i>Availability of financing and firm valuation via Stock market</i>			
log_MC	3.75**	0.07	0.85
MC/GDP	3.51**	0.77	1.59
STTV	2.64**	-0.15	2.44**
STT	1.22	-0.51	1.48
<i>Capital accumulation and investment</i>			
log_GCF	5.42**	2.44**	-0.91
GDP_AG	0.58	0.48	1.81
GCF/GDP	-1.48	-2.58**	-0.25
GFCF/GDP	-1.16	-2.54**	0.03
log_GVAF	4.87**	5.73**	-1.33
asin_MVA	3.77**	6.54**	-1.72

Table 4.
Efficiency of legal
environment,
availability of credit
and growth

Note(s): The *** indicates a significance level higher than 99.9 %, indicating that the probability that the means of the two groups are equal is less than 0.1%. The ** indicate a significance level higher than 99%, and a * indicates a significance level higher than 95%. Refer to Section 3.1 for variables definitions

and stock market development. Our results in Table 4 indicate that this variable is significantly associates with the total value of stocks traded STTV. Corporations have a better valuation in countries with stronger legal rights indexes.

Finally, the All_DTF variable is an aggregation of the distance to frontier in protecting investors index, enforcing contract index and resolving Insolvency index and is found to be significant at the 1% level and positively associated with the availability of credit financing, valuation of listed companies and stock market turnover, as well as manufacturing value added and gross capital formation. This result adds support to our findings in the previous sections.

4. Conclusion

This paper builds on the recent progress in the corporate governance literature according to which the lack of regulation or the ineffective enforcement, translates into shareholders' and creditors' oppression and can lead to investor expropriation. Agency theory and asymmetry of information explain why in the absence of legal protection of outside investors, financial markets fail to fulfill their role of financing the economy. For instance, if capital providers are not protected from expropriation by controlling shareholders or by opportunistic managers, losses will be incurred for the corporation and more for noncontrolling shareholders. An effective legal protection of outside investors against managerial opportunism requires, first, the legislation and second, the mechanism of enforcing the legislation. Only in this case can the legislation act as a deterrent from diverting shareholders' wealth and undertaking actions that are harmful to outside investors. The third level of protection is needed to resolve disputes that arise in the event of financial distress and insolvency. This third level is particularly important for creditors who risk not recovering their capital in the likely event of bankruptcy. An effective bankruptcy process has an important implication on credit availability but also on effectively supporting distressed firms to reorganize and get back on their feet if they can be viable and unviable firms to be liquidated in a timely manner and

funds returned to creditors. The current pandemic has pushed many SMEs into distress and hence offers a unique opportunity for countries around the world to implement or reform their bankruptcy laws.

We use in total 20 investor protection, enforcing contracts, and resolving insolvency indicators from the doing business dataset and 14 different indicators of the ease of access to credit, the functioning of the stock market and investment and growth to test our hypothesis that countries that protect better investors and minority shareholders have more developed and efficient financial systems. Our results suggest that the extent of investor protection, enforcing contracts and resolving insolvency are significantly associated with the role played by banks and nonbanks, as well as the stock market in financing the corporate sector in 189 different countries during 2003–2017. The aspects of rights protection tested here can be considered as the conditions under which creditors and minority investors can find a safe investment avenue for their capital. Without them, credit allocation is not optimal, equity finance is not easily raised, and investment and growth are hampered. The policy implication from this study indicates that countries ought to develop an investor and creditor-friendly legislation that protects creditors' rights during bankruptcy and ensure fairness and efficiency of the court system as these are important ingredients for a developed financial system.

Finally, the availability of the unique World Bank dataset has made this research project possible, but more would be accomplished in the future when a longer time series of these data becomes available as we will be able to investigate the exact causal relationship between reforms in the legal system, finance, entrepreneurship and growth.

Note

1. [https://datacatalog.worldbank.org/search?search_api_views_fulltext_op=AND&query=domestic credit to the private sector&nid = &sort_by = search_api_relevance&sort_order = DESC](https://datacatalog.worldbank.org/search?search_api_views_fulltext_op=AND&query=domestic%20credit%20to%20the%20private%20sector&nid=&sort_by=search_api_relevance&sort_order=DESC)

References

- Antill, S. (2020), "Do the right firms survive bankruptcy?", available at: <https://ssrn.com/abstract=3383227> or <http://dx.doi.org/10.2139/ssrn.3383227> (accessed 15 September 2020).
- Antill, S. and Grenadier, S.R. (2019), "Optimal capital structure and bankruptcy choice: dynamic bargaining versus liquidation", *Journal of Financial Economics*, Vol. 133, pp. 198-224.
- Armour, J., Simon, D., Sarkar, P., Siems, M. and Singh, A. (2008), "Shareholder protection and stock market development: an empirical test of the legal origins hypothesis", CBR WP No. 108/, University of Cambridge. doi: 10.1111/j.1740-1461.2009.01146.x.
- Armour, J., Hansmann, H. and Kraakman, R. (2009), *Agency Problems*, Legal Strategies and Enforcement Discussion Paper No. 644 7/, Harvard Law School Cambridge, MA 02138.
- Bartlett, M.S. (1949), "Fitting a straight line when both variables are subject to error", *Biometrics*, Vol. 5, pp. 207-212.
- Beck, T., Demircuc-Kunt, A. and Maksimovic, V. (2005), "Financial and legal constraints to growth: does firm size matter?", *Journal of Finance*, Vol. 60 No. 1, pp. 137-177.
- Berdugo, B. and Hadad, S. (2009), "How does investors' legal protection affect productivity and growth?", available at: <https://ssrn.com/abstract=1412324> or <http://dx.doi.org/10.2139/ssrn.1412324>.
- Bernstein, S., Colonnelli, E., Giroud, X. and Iverson, B. (2019a), "Bankruptcy spillovers", *Journal of Financial Economics*, Vol. 133, pp. 608-33.
- Bernstein, S., Colonnelli, E. and Iverson, B. (2019b), "Asset allocation in bankruptcy", *The Journal of Finance*, Vol. 74, pp. 5-53.

- Burkart, M. and Panunzi, F. (2006), "Agency conflicts, ownership concentration, and legal shareholder protection", *Journal of Financial Intermediation*, Vol. 15, p. 31.
- Burunciuc, C. and Gonenc, H. (2021), "Reforms protecting minority shareholders and firm performance: an international evidence", *Journal of Risk and Financial Management*, Vol. 14, p. 5, available at: <https://www.mdpi.com/1911-8074/14/1/5>.
- Carlin, W. and Mayer, C. (2003), "Finance, investment, and growth", *Journal of Financial Economics*, pp. 191-226.
- Claessens, S., Djankov, S. and Lang, L. (2000), "The separation of ownership and control in East Asian corporations", *Journal of Financial Economics*, Vol. 58, pp. 81-112.
- Claessens, S., Fan, J.P.H. and Lang (2002), "Corporate governance in Asia", *A Survey International Review of Finance*, Vol. 3 No. 2, pp. 71-103.
- Deakin, S., Sarkar, P. and Siems, M. (2018), "Is there a relationship between shareholder protection and stock market development?", *Journal of Law, Finance, and Accounting*, Vol. 3 No. 1, pp. 115-146.
- Dyck, A. and Zingales, L. (2004), "Private benefits of control: an international comparison", *The Journal of Finance*, Vol. 59, pp. 537-600.
- Farrar, J.H. and Boule, L. (2001), "Minority shareholder remedies - shifting dispute resolution paradigms", *Bond Law Review*, Vol. 13 No. 2, pp. 273-304.
- Gine, X. and Love, I. (2010), "Do reorganization costs matter for efficiency?", *Evidence from a Bankruptcy reform in Colombia Journal of Law and Economics*, University of Chicago Press, Vol. 53 No. 4, pp. 833-864.
- Gormley, T.A. and Matsa, D.A. (2016), "Playing it safe? Managerial preferences, risk, and agency conflicts", *Journal of Financial Economics*, December 2016, Vol. 122 No. 3, pp. 431-455.
- Jensen, M.C. and Meckling, W.H. (1976), "Theory of the firm: managerial behavior, agency costs and ownership structure", *Journal of Financial Economics*, Elsevier, Vol. 3 No. 4, pp. 305-360.
- Kumar, K., Rajan, R. and Zingales, L. (1999), "What determines firm size NBER", Working Paper No. 7208, available at: <https://www.nber.org/papers/w7208>.
- La Porta, R., Lopez-De-Silanes, F., Shleifer, A. and Vishny, R. (1997), "Legal determinants of external finance", *The Journal of Finance*, Vol. 52 No. 3, pp. 1131-1150.
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A. and Vishny, R.W. (1998), "Law and finance", *Journal of Political Economy*, Vol. 106, pp. 1113-1155.
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A. and Vishny, R.W. (2002), "Investor protection and corporate valuation", *Journal of Finance*, Vol. 57 No. 3, pp. 1147-1170.
- LaPorta, R., Lopez-de-Silanes, F., Shleifer, A. and Vishny, R. (2000), "Investor protection and corporate governance", *Journal of Financial Economics*, Vol. 58 Nos 1-2, pp. 3-27.
- Love, I. (2003), "Financial development and financing constraints: international evidence from the structural investment model", *Review of Financial Studies*, Vol. 16 No. 3, pp. 765-91.
- Neira, J. (2019), "Bankruptcy and cross-country differences in productivity", *Journal of Economic Behavior and Organization*, Vol. 157, pp. 359-381.
- Nenova, T. (1999), "The value of a corporate vote and private benefits: a cross-country analysis, Working Paper, Harvard University Cambridge, MA.
- Ponticelli, J. and Alencar, L.S. (2016), "Court enforcement, bank loans, and firm investment: evidence from a bankruptcy reform in Brazil", *The Quarterly Journal of Economics*, Vol. 131 No. 3, pp. 1365-1413.
- Roe, M.J. and Siegel, J.I. (2013), "Political instability: its effects on financial development, its roots in the severity of economic inequality", *Journal of Comparative Economics*, Vol. 39 No. 2011, pp. 279-309.
- Ross, S. (1973), "The economic theory of agency: the principal's problem", *American Economic Review*, Vol. 63, pp. 134-39.

-
- Safavian, M. and Sharma, S. (2007), "When do creditors rights work", *Journal of Comparative Economics*, Vol. 35 No. 3, pp. 484-508.
- Shleifer, A. and Wolfenzon, D. (2002), "Investor protection and equity markets", *Journal of Financial Economics*, Vol. 66, pp. 3-27.
- Wurgler, J. (2000), "Financial markets and the allocation of capital", *Journal of Financial Economics*, Vol. 58 Nos 1-2, pp. 187-214.
- Zingales, L. (1994), "The value of the voting right: a study of the Milan stock exchange", *Review of Financial Studies*, Vol. 7, pp. 1 25-148.

Corresponding author

Mejda Bahlous-Boldi can be contacted at: mbbcada@rit.edu

Table A1.
Probability that there is no difference between the means in the groups of countries with high standards of investors protection and those with weak standard of investor rights protection

ProbT_value)	PMI_DTF	PMI_SMIIP	PMI_SIP	PMI_LESS	PMI_EDLI	PMI_ED	PMI_ELOC	PMI_EOR	PMI_ESG	EC_DTF	EC_TD	EC_C	EC_P	RL_DTF	RL_SI	RL_RR	TRI	RLCE	ALL_DTF	DCI	LGIR
DIPS	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.03	0.00	0.00	0.00	0.22
DCB	0.00	0.00	0.00	0.00	0.01	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.04	0.00	0.00	0.00	0.18
DGP	0.00	0.00	0.00	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.11	0.00	0.00	0.00	0.60
GDS	0.02	0.19	0.02	0.38	0.01	0.37	0.45	0.29	0.00	0.01	0.00	0.03	0.00	0.00	0.02	0.00	0.05	0.01	0.00	0.02	0.14
STT	0.05	0.86	0.12	0.44	0.85	0.02	ND	0.86	0.94	0.00	0.00	0.01	0.01	0.00	0.03	0.00	0.33	0.07	0.23	0.61	0.15
log_LMC	0.00	0.03	0.00	0.91	0.09	0.00	0.39	0.14	0.12	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.60	0.00	0.00	0.94	0.40
MC	0.03	0.10	0.04	0.32	0.00	0.06	0.81	0.11	0.98	0.00	0.13	0.67	0.00	0.00	0.23	0.00	0.02	0.01	0.00	0.44	0.12
STIV	0.04	0.28	0.10	0.66	0.07	0.04	ND	0.21	0.55	0.00	0.00	0.22	0.00	0.00	0.02	0.00	0.09	0.00	0.01	0.88	0.02
log_GCF	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.02	0.36
GDP_AG	0.04	0.22	0.02	0.26	0.11	0.32	0.46	0.17	0.23	0.00	0.00	0.22	0.07	0.00	0.26	0.00	0.99	0.17	0.56	0.63	0.07
GCF/GDP	0.25	0.12	0.39	0.07	0.64	0.05	0.27	0.40	0.13	0.00	0.00	0.10	0.11	0.33	0.08	0.28	0.62	0.28	0.14	0.01	0.80
GFCF/GDP	0.32	0.03	0.57	0.01	0.66	0.17	0.16	0.20	0.04	0.00	0.00	0.04	0.42	0.56	0.12	0.56	0.55	0.30	0.25	0.01	0.98
log_GVAF	0.00	0.00	0.01	0.53	0.15	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.19
shp_LMVA	0.30	0.03	0.42	0.66	0.55	0.83	0.01	0.65	0.00	0.00	0.49	0.00	0.00	0.00	0.00	0.00	0.11	0.03	0.00	0.00	0.09

The current issue and full text archive of this journal is available on Emerald Insight at:
<https://www.emerald.com/insight/2444-8494.htm>

Measuring the effectiveness of intermediary loyalty programmes in the motor insurance industry: loyal versus non-loyal customers

Loyalty programmes in the insurance industry

305

Manuel Leiria

Faculty of Economics, Cinturs – Research Centre for Tourism, Sustainability and Well-being, Universidade do Algarve, Faro, Portugal

Efigénio Rebelo

Faculty of Economics, Universidade do Algarve, Faro, Portugal, and

Nelson deMatos

School of Management, Hospitality and Tourism, Cinturs – Research Centre for Tourism, Sustainability and Well-being, Universidade do Algarve, Faro, Portugal

Received 11 May 2020
Revised 22 January 2021
10 March 2021
23 May 2021
30 June 2021
5 July 2021
Accepted 13 July 2021

Abstract

Purpose – The insurance industry has not been able to effectively retain its customers and struggles to establish and maintain long-lasting relationships with them. The purpose of this paper is thus to identify the main factors that explain the cancellation of motor insurance policies by individual customers, considering the influence of intermediaries on their decisions.

Design/methodology/approach – The data used in this research is based on a sample of 3,500 insurance policies that lapsed during the period of analysis between January and July 2017, against another sample of 3,500 policies that did not lapse, from a major insurance company in Portugal. Binary logistic regression was used for data analysis, using IBM SPSS software.

Findings – Aggressive tactics by insurance companies for customer acquisition may induce the cancellation of insurance policies. More valuable customers, the policies with higher premiums and recent claims, as well as the ancillary intermediaries and agents, are determinants of insurance cancellation. Conversely, the payment of policies by direct debit and without instalments reduces the probability of cancellations.

Research limitations/implications – The main limitation of this study is the restriction on data access. Insurance companies are significantly resistant to sharing their customer data – including with academic researchers – even in an anonymised form.

Practical implications – The paper highlights internal and external practices of insurance companies that should be reformulated to significantly improve their performance regarding product cancellation, related to customer information management, mistrust behaviours related to stakeholders and new value propositions that deepen the relationships with intermediaries.

Originality/value – This research developed a framework with which to identify the factors that are mainly associated with motor insurance cancellation and to predict its likelihood.

Keywords Customer retention, Intermediary, Motor insurance, Product cancellation

Paper type Research paper

© Manuel Leiria, Efigénio Rebelo and Nelson deMatos. Published in *European Journal of Management and Business Economics*. Published by Emerald Publishing Limited. This article is published under the Creative Commons Attribution (CC BY 4.0) licence. Anyone may reproduce, distribute, translate and create derivative works of this article (for both commercial and non-commercial purposes), subject to full attribution to the original publication and authors. The full terms of this licence may be seen at <http://creativecommons.org/licenses/by/4.0/legalcode>

Funding: This paper is financed by National Funds provided by FCT- Foundation for Science and Technology through project UIDB/04020/2020.



European Journal of Management
and Business Economics
Vol. 31 No. 3, 2022
pp. 305-324
Emerald Publishing Limited
e-ISSN: 2444-8494
p-ISSN: 2444-8451
DOI 10.1108/EJMBE-05-2020-0103

1. Introduction

Insurance is an important business that allows other sectors of the economy to progress (e.g. Han *et al.*, 2010; Weisbart, 2018). As well as its direct economic effect through the financial protection of assets, insurance has a fundamental impact on a customer's peace of mind (Liedtke, 2007). In spite of the importance of this industry to individual people, companies and even nations, however, it has not been able to effectively retain its customers and to establish and maintain long-lasting relationships with them, as demonstrated in previous studies (e.g. Guillen *et al.*, 2003; Brockett *et al.*, 2008; Cohen and Siegelman, 2010). Although insurance companies do not usually reveal their customer retention rates, the fact is that these are rather low (Verhoef and Donkers, 2005). Losing and gaining customers through brand switching is a major, well-founded concern for insurance firms, which generates very negative financial impacts as well as reputational impacts to the industry (Brockett *et al.*, 2008). Lost customers have a negative effect on the company's brand image (de la Llave *et al.*, 2019). The dimension of the challenge is highlighted by an estimated cancellation rate between 24 and 31% (Frees *et al.*, 2018; Mirzamohammadi and Hamid, 2019). Hence, customer loyalty is one of the main challenges (Guillen *et al.*, 2009) and priorities (Bolancé *et al.*, 2016) for most insurance companies.

Product cancellation in the insurance industry has not been a priority in terms of scientific investigation (e.g. Guillen *et al.*, 2003; Braun *et al.*, 2016). "Retention", "cancellation" and "loyalty" are not among the most commonly researched topics in general insurance (Robson and Sekhon, 2011). Customer loyalty to insurance products thus continues to grow in both importance and as a challenge, but remains poorly understood (Taylor, 2016). Loyalty-oriented research and identification of drivers that help explain different loyalty patterns have been identified as an important subject of study for both academicians and managers (Allaway *et al.*, 2006).

Hence, considering the few specific references about customer management, loyalty or retention in the insurance business (Guillen *et al.*, 2003), this study is important because it contributes to filling this gap.

In spite of the relevance of intermediaries in this industry, as the first point of contact between insurance products and customers (Dalla Pozza *et al.*, 2017), research into customer retention has not recognised the influence of intermediaries. The study of lapsing behaviour in insurance has focussed on the socio-demographic characteristics of customers, such as gender or age (Roy, 2012; Staudt and Wagner, 2018), the policy payment method (annual or monthly) and the purchase date or the value of the last premium (Frees *et al.*, 2018; Pinquet *et al.*, 2011), but not on the intermediaries.

Motor insurance and individual customers are also relevant fields through which to research product cancellation (Jeong *et al.*, 2018).

Motor insurance is the largest non-life insurance business in Europe (Insurance Europe, 2018b) and the world (Swiss Re Institute, 2019), and its performance drives the trends observed in the overall non-life sector (OECD, 2020). It is also the insurance that is most frequently cancelled (Brockett *et al.*, 2008). According to Staudt and Wagner (2018), motor insurance customers are more likely to lapse.

The factors that determine the cancellation of policies by individual customers can be significantly different from those by companies. Individual customers have fewer evident and predictable decision processes than organisations (Lopes *et al.*, 2015), who are usually better informed, more rational and objective (Beloucif *et al.*, 2004).

Considering the state of the research and the managerial context of customer retention in insurance, the purpose of this paper is to identify the main factors explaining motor insurance policy cancellation by individual customers, taking into account the influence of intermediaries on their decisions.

Understanding the dynamics behind insurance cancellation and the factors that may explain it is very relevant to the development of the scientific knowledge, considering that it has not been a priority for researchers. Such knowledge is also very important to most

insurance companies in order to prevent insurance cancellation, as customer loyalty is one of its main challenges and priorities (Bolancé *et al.*, 2016; Guillen *et al.*, 2009).

2. Literature review and research hypotheses

The insurance industry faces a problem of customer loyalty that has grown in this era of abundant information, of the digital transformation of businesses that defies strategies and of decision-making assumptions about how to retain customers. Customer loyalty is one of the main challenges (Guillen *et al.*, 2009) and priorities (Bolancé *et al.*, 2016) for most insurance companies, because product cancellation directly affects their profitability (Ascarza *et al.*, 2018; Verhoef and Commandeur, 2001). There is some evidence regarding the association between customer retention and lifetime value (Gupta *et al.*, 2004; Venkatesan and Kumar, 2004) and with equity value (Verhoef and Commandeur, 2001). Several authors (e.g. Reichheld, 1996; Gupta *et al.*, 2004) found that a small increase in retention can have a significant impact on the profitability of organisations. Ascarza *et al.* (2018) argue that retention drives a firm's profitability and value.

There are few specific references for customer retention and loyalty in the insurance industry (Guillen *et al.*, 2003). One reason is that the insurance industry has privileged the study of financial and actuarial elements, paying much less attention to the dynamics behind customer demand for insurance products (Brockett *et al.*, 2008). There are some papers regarding motor insurance cancellation, and among these is a study by Taylor (2016) that demonstrated that both cognitive and affective considerations are important to consumer judgement and decision-making processes. Cohen and Siegelman (2010) examined the profitability of motor insurance customers, demonstrating that the ratio of premiums to losses is larger for repeat policyholders, which were more profitable to the insurance company than new customers. Guillen *et al.* (2003) developed a model to explain motor insurance lapses and to calculate their probability.

There is also a lack of studies regarding customer retention regarding the influence of intermediaries on customer decisions to abandon an insurance company. Although intermediaries are the largest distribution channel in both non-life insurance generally and in motor insurance, in Europe (Insurance Europe, 2018a) and in the world (Swiss Re Institute, 2017), there is still much to be learned. Braun *et al.* (2016) and, more recently, Dominique-Ferreira (2018), have highlighted the very limited research into retail and distribution management in insurance, despite its great importance to the entire business, both upstream and downstream.

Some references were found for the importance of intermediaries in the decisions of insurance customers. According to Short *et al.* (2003), loyal behaviours exist between intermediaries and customers, but not between customers and insurers, which may explain the high churn rates in this business. The insurance company's image as portrayed to customers is affected by the relationship developed between customers and intermediaries (Brophy, 2013a, 2013b; Felício and Freire, 2016; Liljander *et al.*, 2009; Robson *et al.*, 2016).

According to recent findings in the scientific research of insurance cancellation (Leiria *et al.*, 2020), and to the literature reviewed, four research hypotheses were formulated after reviewing the literature, regarding the importance of intermediaries for product cancellation, insurance policy premiums, the existence of claims and the payment options.

2.1 Importance of intermediaries for product cancellation

The levels of customers lapsing in the insurance business may be associated with a customer's vulnerability to the influence of external stakeholders (Brockett *et al.*, 2008), considering that insufficient knowledge of insurance products, by itself, is a cause of lapsing (Pinquet *et al.*, 2011). When there are problems in the insurance value chain, customers tend to

remain clients of the intermediaries but change insurance company (Dominique-Ferreira, 2018). In financial services, retention rates differ among the various acquisition and distribution channels (Verhoef and Donkers, 2005). Therefore, the first hypothesis is:

H1. Intermediaries influence customer decisions to cancel their insurance policies.

There are several classifications of insurance intermediaries. EIOPA (2018), the European Insurance and Occupational Pensions Authority, organised the main types of insurance distributors into five main types: the agents (including four sub-types, the single-tied, the multi-tied, the ancillary and the managing general), brokers, bancassurance, direct writers and digital interfaces such as comparison websites, price aggregators and social media platforms. Hilliard *et al.* (2013) adopted a different classification, considering six broad categories of intermediaries: the direct sales (through direct mail, call centre and Internet), the local agents employed by the insurer, the non-employee sales agents who sell for a single company, the non-employee agents who sell for more than one company (also identified as independent agents), the brokers and bancassurance. In this research, the synthetisation of the different classifications and the characteristics of the database used to collect the information led to the following types of intermediaries: the ancillary, the individual agent, the company agent, the broker, the bank and the direct distribution. Digital interfaces were not considered as intermediaries because in many countries, these channels are classified as brokers and not as a specific distribution channel. In many cases, these platforms are used to gather information to be analysed with the agents and not to finalise the decision process (EIOPA, 2018). Customer use of mobile digital channels, while growing, has remained at low levels in the insurance industry, particularly in developed countries, and only a small percentage of customers use it to conduct their most important transactions (Naujoks *et al.*, 2017).

2.2 Insurance policy premiums

According to Frees *et al.* (2018), the more expensive the policy, the higher the probability it will be lapsed. Fu and Wang (2015) and Guillen *et al.* (2009) explain that increasing the cost of the premium is a major cause of attrition. Beloucif *et al.* (2004) found in the UK insurance market that premium rates may outweigh the role of service quality in insurance purchase which, in its turn, may be associated with a decrease in buyers' loyalty to their insurance providers. Accordingly, the second hypothesis is:

H2. Higher premium policies have a higher probability of being cancelled.

2.3 Existence of claims

According to Guillen *et al.* (2003), making a claim increases the probability of insurance lapsing because it usually leads to a substantial increase in the premium for the current company. Kofman and Nini (2013) found a strong positive correlation between insurance claims and the lapse of the policy for reasons such as avoiding the premium penalties associated with claims. Guillen *et al.* (2009) demonstrated that the existence of a claim is one of the most relevant factors affecting the probability of complete insurance cancellation. Accordingly, the third hypothesis is:

H3. Claims increase the probability of insurance cancellation.

2.4 Payment options

The low frequency of contact between customers and insurance companies (Paredes, 2018) means that increasing interactions for unpleasant or undesirable motives, such as regarding payments, may make people more conscious of the benefits of looking for alternatives, leading to an increased probability of cancellation.

Frees *et al.* (2018) note that the policy payment interval, either annual or monthly, is a relevant factor in understanding lapse behaviour in insurance. It is also important to consider the type of payment used by the customer when assessing customer loyalty (Guillen *et al.*, 2008). Consequently, the following hypothesis was formulated:

- H4.* Annual payment intervals that do not require interaction with the insurance company reduce the probability of insurance cancellation.

3. Methodology

3.1 Data design

The variables selected to identify the factors associated with the cancellation of motor insurance policies are related to the characteristics of policyholders, the products they possess and the distribution channel for these products, according to the literature reviewed (e.g. Cohen and Siegelman, 2010; de la Llave *et al.*, 2019; Farida and Ardyan, 2018; Frees *et al.*, 2018; Fu and Wang, 2015). Nevertheless, the covariates in the model are constrained to those required to achieve a good explanation of the phenomena, considering that the inclusion of additional covariates may reduce the transferability of the analyses to other companies (Brockett *et al.*, 2008).

Kofman and Nini (2013) argued that exogenous, observable and publicly available variables capture the necessary information about policyholders for testing the empirical hypotheses and that these variables were the policyholder characteristics, automobile characteristics, policy characteristics and policy performance.

3.2 Data collection

The data used in this research consists of two samples of motor insurance policies: one that was in force during a period of analysis between January and July 2017, and another that was in force from the same initial time and cancelled by the end of that same period. The study of insurance policies that were cancelled during a period of time, compared with another group of policies that remained in force during the same period, has been previously used in other research (e.g. Brockett *et al.*, 2008). In the same context, but in a different industry, East *et al.* (1998) studied customer defection based on an analysis of defectors and non-defectors.

The data was obtained from a major general insurance company in Portugal. Cohen and Siegelman (2010) similarly based their research on the observable characteristics of customers from a single Israeli insurer to test the coverage–risk prediction of adverse selection in insurance markets. Kofman and Nini (2013) tested the information advantage of retaining lower-risk policyholders using a data set composed exclusively of the comprehensive motor insurance policies in force as of a certain period in time and from a single Australian insurer.

The two samples include 3,500 motor insurance policies for individual customers, randomly collected, in the same way as other authors researching the cancellation of insurance policies (e.g. Caeiro, 2012; Reuss, 2002) (see Table 1).

3.3 Data analysis

Binary logistic regression is used in this research for data analysis. These models are adequate to identify relevant associations between the cancellation of an insurance policy and

<i>N</i>	Source	Country	Sex (% male) (<i>M</i>)	Age (years) (<i>M/SD</i>)
7,000 motor insurance policies	General insurance company	Portugal	70.3	50.3/14.0

Table 1.
Research sample

the independent variables, as well as to calculate the probability of a cancellation. According to Fu and Wang (2015), logistic regressions are natural choices for modelling binary response variables because this method has become a standard in insurance retention modelling. Verhoef and Donkers (2005) also argue that, as customer retention is a binary variable (defection/retention), the probit model is the best option with which to estimate the effect of the acquisition channel on customer retention. Brockett *et al.* (2008) also used a logistic regression model to predict the probability of a policy cancellation. Guillen *et al.* (2003) described this method as suitable for constructing a lapse score to provide some indication of the customer's expected behaviour before the cancellation of the policy.

Logistic models are usually estimated using the maximum likelihood method (Agresti, 2002; Agresti and Kateri, 2014; Cox and Snell, 1989). Once the maximum likelihood estimates have been obtained, they can be used to make statistical inferences concerning the relationships between the cancellation behaviour and the independent variables.

The variables used in the binary logistic regression are described in Table 2.

Considering the dependent and the independent variables, the maximum likelihood method was used to estimate the model parameters. The data analysis was carried out using IBM's SPSS software version 24.

The resulting logistic regression model is as follows:

Equation 1: Logistic Regression Model

$$\begin{aligned} \ln\left(\frac{P_i}{1-P_i}\right) = & \hat{\beta}_0 + \hat{\beta}_1(\text{CUSTM.PREM.200} - 300) + \hat{\beta}_2(\text{CUSTM.PREM.300} - 500) \\ & + \hat{\beta}_3(\text{CUSTM.PREM.500+}) + \hat{\beta}_4(\text{CUSTM.CLAIM.Y}) \\ & + \hat{\beta}_5(\text{CUSTM.GENDER.M}) + \hat{\beta}_6(\text{CUSTM.AGE}) \\ & + \hat{\beta}_7(\text{POL.PREM.200} - 300) + \hat{\beta}_8(\text{POL.PREM.300} - 500) \\ & + \hat{\beta}_9(\text{POL.PREM.500+}) + \hat{\beta}_{10}(\text{POL.CLAIM.Y}) \\ & + \hat{\beta}_{11}(\text{POL.AGE.2} - 5) + \hat{\beta}_{12}(\text{POL.AGE.5+}) \\ & + \hat{\beta}_{13}(\text{POL.INSTAL.04}) + \hat{\beta}_{14}(\text{POL.INSTAL.02}) \\ & + \hat{\beta}_{15}(\text{POL.INSTAL.01}) + \hat{\beta}_{16}(\text{POL.PAY.DD}) \\ & + \hat{\beta}_{17}(\text{INTERM.ANCIL}) + \hat{\beta}_{18}(\text{INTERM.AGENT.IND}) \\ & + \hat{\beta}_{19}(\text{INTERM.AGENT.COMP}) + \hat{\beta}_{20}(\text{INTERM.BROKER}) \\ & + \hat{\beta}_{21}(\text{INTERM.BANK}) + \hat{\mu}_i \end{aligned}$$

where $\ln\left(\frac{P_i}{1-P_i}\right)$ is the logit, $\hat{\beta}_i$ the regression coefficients and $\hat{\mu}_i$ the residuals.

4. Results

The results obtained from the integral logit model indicated in Table 3 reveal that, at the conventional level of $\alpha = 0.05$, considering the independent variables identified in the "data design" procedure, eight are not statistically significant, considering the p -values of the parameters as superior to 0.05, given the other variables in the regression.

A restricted version of the regression, however, suggests that the exclusion of some of the non-statistically significant variables, when considered individually, may reduce the p -value

Dependent variable	Description	Type	Values
PROD_CANC	Product cancelled	Categorical binary	Assumes the value 1 when the motor insurance policy is cancelled and 0 when the motor insurance policy is not cancelled
Independent variables	Description	Research topics	Representative papers
DIRECT	No intermediary	Intermediaries influence customer decisions to cancel their insurance policies	Verhoef and Donkers (2005)
INTERM_ANCIL	Ancillary		Brockett <i>et al.</i> (2008) Pinquet <i>et al.</i> (2011), Felício and Freire (2016) Dominique-Ferreira (2018)
INTERM_AGENT_IND	Individual agent		
INTERM_AGENT_COMP	Company agent		
INTERM_BROKER	Broker		
INTERM_BANK	Bank		

(continued)

Table 2.
Description of dependent and independent variables

Table 2.

Independent variables	Description	Research topics	Representative papers	Type	Values
POL_PREM_-200	Policy premium inferior to € 200	Higher premium policies have a higher probability of being cancelled	Beloucif <i>et al.</i> (2004), Guillen <i>et al.</i> (2009), Fu and Wang (2015), Frees <i>et al.</i> (2018)	Dummy (Reference class)	Assumes value 1 when the premium of the policy is inferior to €200 and 0 otherwise
POL_PREM_200-300	Policy premium is equal or superior to €200 and inferior to €300			Dummy	Assumes value 1 when the premium of the policy is equal or superior to €200 and inferior to €300, and 0 otherwise
POL_PREM_300-500	Policy premium is equal or superior to €300 and inferior to €500			Dummy	Assumes value 1 when the premium of the policy is equal or superior to €300 and inferior to €500, and 0 otherwise
POL_PREM_500+	Policy premium is equal or superior to €500			Dummy	Assumes value 1 when the premium of the policy is equal or superior to €500, and 0 otherwise
POL_CLAIM_Y	Policy claims	Claims increase the probability of insurance cancellation	Guillen <i>et al.</i> (2003), Kofman and Nini (2013), Guillen <i>et al.</i> (2009)	Dummy	Assumes value 1 when the policy has, at least, one claim, and 0 otherwise
CUST_CLAIM_Y	Customer claims		Paredes (2018)	Dummy	Assumes value 1 when the customer has, at least, one claim in any policy in force, and 0 otherwise

(continued)

Independent variables	Description	Research topics	Representative papers	Type	Values
POL_INSTAL_12	Monthly payments	Annual payments that do not require interaction with the insurance company reduce the probability of insurance cancellation	Guillen <i>et al.</i> (2008) Frees <i>et al.</i> (2018) Paredes (2018)	Dummy (Reference class) Dummy	Assumes value 1 when the policy is paid in 12 instalments, and 0 otherwise Assumes value 1 when the policy is paid in four instalments, and 0 otherwise Assumes value 1 when the policy is paid in two instalments, and 0 otherwise Assumes value 1 when the policy has an annual payment, and 0 otherwise Assumes value 1 when the payment method is a direct debit from a bank account, and 0 when the payment method is not a direct debit from a bank account
POL_INSTAL_04	Quarterly payments			Dummy	
POL_INSTAL_02	Semi-annual payments			Dummy	
POL_INSTAL_01	Annual payments			Dummy	
POL_PAY_DD	Payment by direct debit on the bank account			Dummy	
CUSTOM_PREM_-200	Customer premium is less than € 200	The probability of insurance cancellation increases with the total value of premiums paid by the customer	Pinquet <i>et al.</i> (2011) Bolan�c <i>et al.</i> (2016) Jeong <i>et al.</i> (2018)	Dummy (Reference class) Dummy	Assumes value 1 when the total value of customer premiums is inferior to €200, and 0 otherwise Assumes value 1 when the total value of customer premiums is equal or superior to €200 and inferior to €300, and 0 otherwise Assumes value 1 when the total value of customer premiums is equal or superior to €300 and inferior to €500, and 0 otherwise Assumes value 1 when the total value of customer premiums is superior to €500 and 0 otherwise
CUSTOM_PREM_200-300	Customer premium is equal to or more than €200 and less than €300				
CUSTOM_PREM_300-500	Customer premium is equal to or more than €300 and less than €500				
CUSTOM_PREM_500+	Customer premium is equal to or more than €500				

(continued)

Table 2.

Table 2.

Independent variables	Description	Research topics	Representative papers	Type	Values
CUSTM_GENDER_M	Customer gender	The sociodemographic characteristics of customers, such as gender or age, affect its insurance lapsing behaviour	Ayuso <i>et al.</i> (2018) Frees <i>et al.</i> (2018) Taylor (2016), de la Llave <i>et al.</i> (2019)	Dummy	Assumes value 1 when the customer is male, and 0 when the customer is female
CUSTM_AGE	Customer age			Quantitative variable	Age in years, limited to the interval 18 to 90
POL_AGE_0-1	Policy age is inferior to two years	The probability of insurance cancellation decreases with the years it is in force with the insurer	Fu and Wang (2015), Frees <i>et al.</i> (2018), Staudt and Wagner (2018)	Dummy (Reference class)	Assumes value 1 when the age of the policy is inferior to two years, and 0 otherwise
POL_AGE_2-5	Policy age is equal or superior to 2 years and inferior to 5 years			Dummy	Assumes value 1 when the age of the policy is equal or superior to two years and inferior to five years, and 0 otherwise
POL_AGE_5+	Policy age is equal or superior to 5 years			Dummy	Assumes value 1 when the age of the policy is equal or superior to five years, and 0 otherwise

Variables in the equation	$\hat{\beta}$	S.E.	Wald	df	p-value	\hat{e}^{β}
CUSTM_PREM_200-300	0.144	0.080	3.217	1	0.073	1.155
CUSTM_PREM_300-500	0.219	0.070	9.732	1	0.002	1.245
CUSTM_PREM_500+	0.433	0.077	3.1814	1	0.000	1.542
CUSTM_CLAIM_Y	0.054	0.089	0.372	1	0.542	1.055
CUSTM_GENDER_M	-0.115	0.057	4.096	1	0.043	0.892
CUSTM_AGE	0.000	0.002	0.030	1	0.863	1.000
POL_PREM_200-300	0.028	0.083	0.113	1	0.737	1.028
POL_PREM_300-500	-0.377	0.095	1.5613	1	0.000	0.686
POL_PREM_500+	0.710	0.181	1.5443	1	0.000	2.033
POL_CLAIM_Y	0.255	0.106	5.756	1	0.016	1.290
POL_AGE_2-5	0.301	0.056	2.9206	1	0.000	1.351
POL_AGE_5+	0.345	0.080	1.8833	1	0.000	1.412
POL_INSTAL_04	0.118	0.164	0.520	1	0.471	1.125
POL_INSTAL_02	-0.258	0.150	2.972	1	0.085	0.773
POL_INSTAL_01	-0.544	0.143	1.4361	1	0.000	0.581
POL_PAY_DD	-1.105	0.089	1.52909	1	0.000	0.331
INTERM Ancil	0.646	0.257	6.310	1	0.012	1.909
INTERM_AGENT_IND	0.537	0.139	1.4905	1	0.000	1.711
INTERM_AGENT_COMP	0.492	0.138	1.2791	1	0.000	1.636
INTERM_BROKER	0.290	0.167	3.021	1	0.082	1.337
INTERM_BANK	0.094	0.292	0.103	1	0.748	1.098
Constant	-0.294	0.221	1.775	1	0.183	0.745

Source(s): IBM SPSS Outputs and own calculations

Table 3. Unrestricted logistic regression model estimation results

of the remaining variables. It is thus necessary to test whether all the coefficients associated with those variables can be jointly equal to zero.

Following the stepwise method, considering the non-rejection of the null hypothesis of each variable as significantly different from 0, to $\alpha = 0.05$, the non-significant variables were successively removed, in descending order of the p -values, until all the coefficients presented p -values under 0.05. The resulting restricted logistic regression model estimation is presented in Table 4.

In addition to the 13 explanatory variables initially considered statistically significant, two variables (“total customer premium between €200 and €300 and” Semi-annual payments”) which were non-significant in the unrestricted logistic regression model become significant in the restricted model, with p -values, respectively, equal to 0.041 and 0.001, hence inferior to the reference value of 0.05.

The restricted model was evaluated in relation to the integral model, testing the null hypothesis that the excluded parameters are not significantly different from 0, to $\alpha = 5\%$:

$$H_0: \beta_4 = \beta_6 = \beta_7 = \beta_{13} = \beta_{20} = \beta_{21} = 0$$

The G^2 test indicates that the null hypothesis H_0 is not rejected, concluding that the restricted model reveals a better explanatory capacity than the original model.

$$G^2(6) = X_0^2 - X_R^2 = -2LL_0 - (-2LL_R) = 9300.941 - 9296.662 = 4.279 < 12.592(\chi^2, 6df)$$

(df = 21 - 15 = 6, $\alpha = 0.05$)

The resulting restricted logit model is as follows:

Variables in the equation	$\hat{\beta}$	S.E.	Wald	df	p-value	$e^{\hat{\beta}}$
CUSTM_PREM_200-300	0.153	0.075	4.175	1	0.041	1.166
CUSTM_PREM_300-500	0.227	0.068	1.0999	1	0.001	1.255
CUSTM_PREM_500+	0.447	0.069	4.1643	1	0.000	1.564
CUSTM_GENDER_M	-0.114	0.056	4.078	1	0.043	0.893
POL_PREM_300-500	-0.379	0.092	1.7073	1	0.000	0.684
POL_PREM_500+	0.712	0.178	1.6078	1	0.000	2.038
POL_CLAIM_Y	0.306	0.072	1.8275	1	0.000	1.358
POL_AGE_2-5	0.299	0.055	2.9371	1	0.000	1.349
POL_AGE_5+	0.345	0.077	2.0100	1	0.000	1.412
POL_INSTAL_02	-0.337	0.105	1.0230	1	0.001	0.714
POL_INSTAL_01	-0.626	0.094	4.4581	1	0.000	0.535
POL_PAY_DD	-1.139	0.083	1.87243	1	0.000	0.320
INTERM_ANCIL	0.472	0.233	4.098	1	0.043	1.604
INTERM_AGENT_IND	0.362	0.087	1.7415	1	0.000	1.436
INTERM_AGENT_COMP	0.316	0.084	1.4332	1	0.000	1.372
Constant	-0.015	0.127	0.013	1	0.909	0.986
$X_0^2 - X_R^2 = -2LL_0 - (-2LL_R) = 9300,941 - 9296,662 = 4,279$						

Table 4.
Results of the restricted
logistic regression
model estimation and
test of exclusion
restrictions

Source(s): IBM SPSS Outputs and own calculations

Equation 2: Restricted Logistic Regression Model

$$\ln\left(\frac{P_i}{1-P_i}\right) = \hat{\beta}_0 + \hat{\beta}_1(\text{CUSTM_PREM_200} - 300) + \hat{\beta}_2(\text{CUSTM_PREM_300} - 500) \\ + \hat{\beta}_3(\text{CUSTM_PREM_500+}) + \hat{\beta}_5(\text{CUSTM_GENDER_M}) \\ + \hat{\beta}_8(\text{POL_PREM_300} - 500) + \hat{\beta}_9(\text{POL_PREM_500+}) \\ + \hat{\beta}_{10}(\text{POL_CLAIM_Y}) + \hat{\beta}_{11}(\text{POL_AGE_2} - 5) + \hat{\beta}_{12}(\text{POL_AGE_5+}) \\ + \hat{\beta}_{14}(\text{POL_INSTAL_02}) + \hat{\beta}_{15}(\text{POL_INSTAL_01}) \\ + \hat{\beta}_{16}(\text{POL_PAY_DD}) + \hat{\beta}_{17}(\text{INTERM_ANCIL}) \\ + \hat{\beta}_{18}(\text{INTERM_AGENT_IND}) + \hat{\beta}_{19}(\text{INTERM_AGENT_COMP}) + \hat{\mu}_i$$

According to the estimates produced by the restricted logistic regression model (Table 4), there are two significant predictors of insurance cancellation related to the customers' characteristics, which are the total premium paid ("total customer premium between €200 and €300", "total customer premium between €300 and €500" and "total customer premium above €500") and gender (male); five significant predictors related to the insurance policy: the premium, but in this case, only above €300 ("policy premium between €300 and €500" and "policy premium above €500"); the existence of claims; the number of years it has been in force ("policy age between 2 and 5 years" and "policy age above 5 years"); whether payment is annual or semi-annual; and the method of payment as "direct debit"; and three types of distribution channels, which are the ancillary, the individual agents and the company agents.

Considering the impact on the logit, determined by the restricted logistic regression model, the probability of a cancellation increases with the total premium paid by the customer, the premium of the policy being above €500, the existence of claims in the policy, the age of the policy and three types of intermediaries, which are the ancillary, individual agents and company agents.

All other variables being equal, the higher the total premiums paid by the customer and the premium of the policy, when above €500, the higher the probability that it will be cancelled. The marginal impact on the logit of the total premium paid by the customer, considering its highest interval (above €500), is 0.447, and for the policy premium, also at the highest value interval (above €500), is 0.712. In these cases, the odds ratios are, respectively, 1.564 and 2.038.

A claim on the policy, all other factors being equal, also increases the probability of cancellation. The marginal impact in the logit is 0.306 and the odds ratio 1.358.

Still considering the assumption that all other variables remain equal, the older the policy, the higher its probability of cancellation, considering the marginal impact on the logit of policy age between 2 and 5 years (0.299) and above 5 years (0.345). In these cases, the odds ratio is, respectively, 1.349 and 1.412.

Ancillary intermediaries – the individual agents and the company agents – also increase the probability of insurance cancellation. Accordingly, the marginal impact on the logit of ancillary, the least committed distribution channel in the insurance industry (0.472), is higher than for individual agents (0.362), but smaller than for company agents (0.316). The odds ratios, in these three cases are, respectively, 1.604, 1.436 and 1.372.

Conversely, the impact on the logit, determined by the restricted logistic regression model (Table 4), reveals a decreased probability of cancellation when the customer is male, the policy premium is between €300 and €500, the frequency of payments is lower, annual or semi-annual and the payment method is a direct debit from a bank account. The marginal impact on the logit varies between –1.139 (for direct debit as payment method) and –0.114 (for male customers). In these two cases, the odds ratios are, respectively, 0.320 and 0.893.

According to the results produced by the restricted logistic regression model, six factors are not statistically significant predictors of insurance cancellation: a customer's previous claims considering all their policies, customer age, a policy with premiums below €300, quarterly instalment payments and the intermediation of brokers or banks.

The final restricted model allows the probability of a motor insurance cancellation to be calculated. For instance, for an insurance policy used in a company for three years, with a premium of € 350, without claims, for whom the customer is male and who pays a total of €700 annually for their motor insurance policies, without instalments, by direct debit from a bank account, directly written by the insurance company and without an intermediary, the logit can be estimated with the following equation:

$$\ln \left(\frac{\hat{P}_i}{1 - \hat{P}_i} \right) = -0.015 + 0.447(\text{CUSTM_PREM_500+}) - 0.114(\text{CUSTM.GENDER.M}) \\ + 0.299(\text{POL.AGE.2 - 5}) - 0.379(\text{POL.PREM.300 - 500}) \\ - 0.626(\text{POL_INSTAL_01}) - 1.139(\text{POL.PAY.DD}) = -1.527$$

Accordingly, the probability of this insurance being cancelled can be found from the following equation:

$$\hat{P}_i = \frac{e^{y_i}}{1 + e^{y_i}} = \frac{e^{-1.527}}{1 + e^{-1.527}} = 0.178$$

The probability of this policy being cancelled is therefore 0.178, which means that 17.8% of insurance policies in these conditions will be cancelled.

The results of the models allow us to draw conclusions regarding the hypothesis formulated above.

Hypothesis H1, “*Intermediaries influence customers’ decision to cancel its insurance policies*”, is rejected. The restricted version of the model (Table 4) demonstrates that, although ancillary, individual agents and company agents were statistically relevant to predicting insurance cancellation, the same is not true for brokers and banks. This conclusion confirms the findings of Paredes (2018) – that the acquisition of insurance through a sales agent is a determinant of churn, which is not verified if the channel is a broker. Verhoef and Donkers (2005) also found substantial evidence that some channels have a negative effect on customer retention, while others are associated with higher retention rates. From a different perspective, Christiansen *et al.* (2016) came to the same conclusion, confirming that contracts purchased from tied agents are less likely to lapse, highlighting the relevance of intermediaries as the exclusive distributors of a single insurance company for customer retention.

Hypothesis H2, “*Higher premium policies have a higher probability of being cancelled*”, is not rejected, considering that the variable “policy premium above €500” increases the probability of cancellation, which is the opposite effect to that observed with the variable representing premiums below this interval. The marginal impact on the logit of these variables is positive, in the first case (0.712), increasing the probability of insurance cancellation, and negative in the second (–0.379), decreasing that probability. The odds ratios are, respectively, 2.038 and 0.684. Other variables for policy premiums are statistically non-significant and were omitted from the restricted model (Table 4).

Hypothesis H3, “*Claims increase the probability of insurance cancellation*”, is not rejected. The independent variable “policy with claim” is statistically significant. According to the restricted model (Table 4), the existence of a claim increases, *ceteris paribus*, logit by 0.306, with an odds ratio of 1.358. The fact that the independent variable “policy with claim” did not reveal statistical significance in the restricted model (Table 4) may be interpreted as an arbitrage of customers, eventually induced by their intermediaries, in terms of only cancelling the policies for which premiums will increase as a consequence of making a claim, as in the case of motor insurance with the application of bonus-malus schemes (Ayuso *et al.*, 2018; Dionne and Harrington, 2017; Kofman and Nini, 2013), and not cancelling the policies that do not have claims or for which claims do not directly increase the premium.

Hypothesis H4, “*Annual payment intervals that do not require interaction with the insurance company reduce the probability of insurance cancellation*”, is not rejected, as both variables, “annual payment” and “payment by direct debit”, are statistically significant. Estimates of their parameters and exponentials, as shown in Table 4, indicate that, if all else is held constant, changing from a monthly payment, the reference category, to an annual payment induces a decrease of –0.626 in the logit, with an odds ratio of 0.535. A change in the payment method from an intermediated alternative to direct debit from a bank account induces a decrease of –1.139 in the logit, with an odds ratio of 0.320.

5. Discussion

Ancillary intermediaries and agents are determinants of insurance cancellation, as demonstrated in this study. Insurance customers tend to be more loyal to intermediaries than they are to insurers (Brophy, 2013a; Eckardt and R athke-D oppner, 2010; Miotto and Parente, 2015; Twing-Kwong *et al.*, 2013). Different acquisition channels, however, affect customer retention differently (Verhoef and Donkers, 2005). The initiative and effort required to cancel insurance policies may be prompted by smaller intermediaries, non-exclusive to any insurer, with the objective of reducing the premium paid by customers who reap the benefits of an insurer’s promotions and also benefit from the commissions resulting from its growth rate in new customers.

More valuable customers and higher premium policies tend to be more commonly targeted by the acquisition tactics of competitors, as they are more subject to cancellation. Large

polices have more negotiation power, and customers are more likely to switch insurance carrier if they do not receive favourable renewal prices or desirable coverage (Fu and Wang, 2015; Pick, 2014). Older policies in a company are also more vulnerable to being cancelled. Brand new policies are somewhat riskier and receive a premium discount relative to their risk (Kofman and Nini, 2013), which can inhibit their cancellation in the initial years with an insurance company.

The results also demonstrate that the existence of claims is a predictor of insurance cancellation, which is in line with Frees *et al.* (2018), who argued that customers with a claim have a higher tendency to lapse due to the fear that an unfavourable experience rating induces premium increases.

The finding that insurance cancellation is negatively correlated with payment by direct debit and without instalments is a consequence of the low frequency of contact between insurance companies and customers. The rare interactions between insurance companies and customers are usually associated with unpleasant situations, such as making payments and claims.

The low involvement with a product, as in the case of an insurance policy, leads customers to spend less time and effort searching that product, which can decrease the likelihood of identifying more attractive alternatives (Wirtz *et al.*, 2014). Increasing the frequency of instalments may contradict the effect of a customer's low involvement with insurance, which reduces the search for alternatives.

Direct debit from a bank account has a negative impact on product cancellation because if nothing is done, the default process is the automatic renewal of insurance, even if customers feel they should cancel and switch to another provider. In the case of paying insurance by direct debit from a bank account, passive behaviour has the consequence of not cancelling the policy.

As the market becomes saturated, it becomes more difficult to find new consumers, and as a consequence of the limited options to increase customer bases, companies sometimes make surprising offers to acquire a competitor's loyal customers (Woodham *et al.*, 2017). Aggressively attracting new customers, directly or through an intermediary, is thus a strategy used by the vast majority of insurers, threatening customer loyalty across the whole industry (Gelder *et al.*, 2018). The reduced levels of customer retention in the insurance industry are also, therefore, the responsibility of insurers, who are focussed on tempting customers to change providers through offers with unsustainably cheap starting premiums (Gelder *et al.*, 2018).

6. Conclusion and implications

This research aimed to improve comprehension of the dynamics behind insurance customers' decisions to cancel their insurance policies. It is vital for a retailer to fully understand the concept of customer loyalty because otherwise they will fail to collect, analyse and decide upon the right action with the correct data (Larsson and Broström, 2019). To decrease the current levels of product cancellation, insurance companies need to know their customers and identify those who are more likely to be targeted by competitors, such as those who pay more premiums or have older and more expensive policies. They must also pay attention to market dysfunctionalities that generate competitive disadvantages, such as immediate and substantial increases of premiums or the withdrawal of functionalities from policies after claims are made, especially if the concurrent offers do not consider this variable in their acquisition proposals. Insurance companies should also review the business processes that augment opportunities of cancellation, such as payment methods. In this case, the payment of premiums by direct means, such as a direct debit from a bank account and without instalments, should be clearly incentivised.

Insurance companies must integrate intermediaries who distribute insurance in their efforts to improve customer retention, developing long-term partnerships where their exclusivity is clearly compensated. New value propositions must be developed, increasing the weight of alternative forms of remuneration to the traditional and prevailing payment of commissions over the business volumes. New business indicators, either qualitative, such as customer satisfaction or the customer recommendations, or quantitative, such as retention rate or client seniority, measured by the average years customers are with the company, are important pillars for more effective retention strategies.

This research has improved the theoretical body of knowledge behind customer decisions to cancel their motor policies. The framework developed to identify the factors that are mainly associated with product cancellation, and to predict its probability, has demonstrated their reliability and robustness. The results demonstrated that the effect of intermediaries on customer retention must be considered.

The main contributions of this research to the insurance industry are, firstly, an improved understanding of the concept of customer loyalty, which is necessary for insurance companies to collect, analyse and decide upon the right action with the correct data. The identification of the factors that insurance companies must adequately manage in order to reduce product cancellation is another contribution. Finally, the importance of insurance companies to change their priorities from the acquisition to the retention of customers was highlighted. The excessive focus of insurance company strategies on the acquisition of customers is one of the reasons for the high levels of product cancellation in this industry.

The main limitation of this study is the restriction on data access. Insurance companies are significantly resistant to sharing their customer data – including with academic researchers – even in an anonymised form.

The impact on customer loyalty from the disruptive value propositions of new insurance providers, sustained in digital frameworks, is a relevant avenue for future investigation regarding the development of research about customer retention in insurance.

There is also a clear tendency to increase interactions between insurance companies and customers, supported by new technologies. The impact on customer retention and loyalty from the development of valuable and frequent contacts between customers and insurance companies is another field for further research.

References

- Agresti, A. (2002), *Categorical Data Analysis*, 2nd ed., Wiley, available at: <http://search.ebscohost.com/login.aspx?direct=true&db=edsebk&AN=769330&site=eds-live>.
- Agresti, A. and Kateri, M. (2014), "Some remarks on latent variable models in categorical data analysis", *Communications in Statistics-Theory and Methods*, Vol. 43 No. 4, pp. 801-814, doi: 10.1080/03610926.2013.814783.
- Allaway, A.W., Gooner, R.M., Berkowitz, D. and Davis, L. (2006), "Deriving and exploring behavior segments within a retail loyalty card program", *European Journal of Marketing*, Vol. 40 Nos 11/12, pp. 1317-1339, doi: 10.1108/03090560610702830.
- Ascarza, E., Neslin, S.A., Netzer, O., Anderson, Z., Fader, P.S., Gupta, S., Hardie, B.G.S., Lemmens, A., Libai, B., Neal, D., Provost, F. and Schrif, R. (2018), "Pursuit of enhanced customer retention management: review, key issues, and future directions", *Customer Needs and Solutions*, Vol. 5 Nos 1/2, pp. 65-81, doi: 10.1007/s40547-017-0080-0.
- Ayuso, M., Guillen, M. and Nielsen, J.P. (2018), "Improving automobile insurance ratemaking using telematics: incorporating mileage and driver behaviour data", *Transportation*, Vol. 46 No. 3, pp. 735-752, doi: 10.1007/s11116-018-9890-7.
- Beloucif, A., Donaldson, B. and Kazanci, U. (2004), "Insurance broker –client relationships: an assessment of quality and duration", *Journal of Financial Services Marketing*, Vol. 8 No. 4,

- pp. 327-342, available at: <http://search.ebscohost.com/login.aspx?direct=true&site=eds-live&db=bth&AN=13169535>.
- Bolancé, C., Guillen, M. and Padilla-Barreto, A.E. (2016), "Predicting probability of customer churn in insurance", *Modeling and Simulation in Engineering, Economics and Management - International Conference, MS 2016, Proceedings*, Vol. 254, doi: 10.1007/978-3-319-40506-3_9.
- Braun, A., Schmeiser, H. and Schreiber, F. (2016), "On consumer preferences and the willingness to pay for term life insurance", *European Journal of Operational Research*, Vol. 253 No. 3, pp. 761-776, doi: 10.1016/j.ejor.2016.02.023.
- Brockett, P.L., Golden, L.L., Guillen, M., Nielsen, J.P., Parner, J. and Perez-Marin, A.M. (2008), "Survival analysis of a household portfolio of insurance policies: how much time do you have to stop total customer defection?", *Journal of Risk and Insurance*, Vol. 75 No. 3, pp. 713-737, available at: <http://search.ebscohost.com/login.aspx?direct=true&db=heh&AN=33461551&site=eds-live>.
- Brophy, R. (2013a), "Adding value to insurance products: the AXA Irish experience", *Journal of Product and Brand Management*, Vol. 22 No. 4, pp. 293-299, doi: 10.1108/JPBM-09-2012-0183.
- Brophy, R. (2013b), "Bancassurance: an insurance concept from a Irish perspective", *Journal of Financial Regulation and Compliance*, Vol. 21 No. 4, pp. 319-333, doi: 10.1108/JFRC-12-2012-0052.
- Caeiro, V.C.S. (2012), "Avaliação do risco de crédito de clientes empresariais: levantamento de requisitos e estimação de modelos", Instituto Superior de Economia e Gestão, Universidade Técnica de Lisboa.
- Christiansen, M.C., Eling, M., Schmidt, J. and Zirkelbach, L. (2016), "Who is changing health insurance coverage? Empirical evidence on policyholder dynamics", *Journal of Risk and Insurance*, Vol. 83 No. 2, pp. 269-299, doi: 10.1111/jori.12053.
- Cohen, A. and Siegelman, P. (2010), "Testing for adverse selection in insurance markets", *Journal of Risk and Insurance*, Vol. 77 No. 1, pp. 39-84, doi: 10.1111/j.1539-6975.2009.01337.x.
- Cox, D.R. and Snell, E.J. (1989), *Analysis of Binary Data*, 2nd ed., Vol. 00032, Routledge, available at: <http://search.ebscohost.com/login.aspx?direct=true&db=edsebk&AN=1838609&site=eds-live>.
- Dalla Pozza, I., Heitz-Spahn, S. and Texier, L. (2017), "Generation Y multichannel behaviour for complex services: the need for human contact embodied through a distance relationship", *Journal of Strategic Marketing*, Vol. 25 No. 3, pp. 226-239, doi: 10.1080/0965254X.2017.1299785.
- de la Llave, M.Á., López, F.A. and Angulo, A. (2019), "The impact of geographical factors on churn prediction: an application to an insurance company in Madrid's urban area", *Scandinavian Actuarial Journal*, Vol. 2019 No. 3, pp. 188-203, doi: 10.1080/03461238.2018.1531781.
- Dionne, G. and Harrington, S. (2017), "Insurance and insurance markets", *SSRN Electronic Journal*. doi: 10.2139/ssrn.2943685.
- Dominique-Ferreira, S. (2018), "The key role played by intermediaries in the retail insurance distribution", *International Journal of Retail and Distribution Management*, Vol. 46 No. 11, pp. 1170-1192, doi: 10.1108/IJRDM-10-2017-0234.
- East, R., Harris, P., Lomax, W., Willson, G. and Hammond, K. (1998), "Customer defection from supermarkets", *Advances in Consumer Research*, Vol. 25 No. 1, pp. 507-512, available at: <http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=83386486&site=eds-live>.
- Eckardt, M. and Rähke-Döppner, S. (2010), "The quality of insurance intermediary services—empirical evidence for Germany", *Journal of Risk and Insurance*, Vol. 77 No. 3, pp. 667-701, available at: <http://search.ebscohost.com/login.aspx?direct=true&db=heh&AN=52649159&site=eds-live>.
- EIOPA (2018), *Insurance Distribution Directive - Evaluation of The Structure of Insurance Intermediaries Markets in Europe*, Luxembourg, ISBN 978-92-9473-116-6, doi: 10.2854/422696.

- Farida, N. and Ardyan, E. (2018), "The driving of customer loyalty: relational approach, perceived value and corporate image", *International Journal of Business and Society*, Vol. 19 No. 1, pp. 15-26, available at: <https://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=128886137&site=eds-live>.
- Felício, J.A. and Freire, C.R. (2016), "From customer motivation to corporate performance. The role of strategic factors and distribution channels of financial service firms", *Service Business*, Vol. 10 No. 1, pp. 135-157, doi: 10.1007/s11628-014-0260-z.
- Frees, E.W., Bolancé, C., Guillen, M. and Valdez, E. (2018), *Joint Models of Insurance Lapsation and Claims*, available at: <http://arxiv.org/abs/1810.04567>.
- Fu, L. and Wang, H. (2015), "Estimating insurance attrition using survival analysis", *Variance: Advancing the Science of Risk*, Vol. 8 No. 1, pp. 55-72, available at: <http://search.ebscohost.com/login.aspx?direct=true&db=edo&AN=102816265&site=eds-live>.
- Gelder, F., van Broström, E. and Bengtsson, V. (2018), *Growing Customer Loyalty in The Age of Disruption: A Study on the Swedish P&C Insurance Industry*, available at: <https://www.differ.se/2018/06/27/growing-customer-loyalty-in-the-age-of-disruption/>.
- Guillen, M., Parner, J., Densgsoe, C. and Perez-Marin, A. (2003), "Using logistic regression models to predict and understand why customers leave an insurance company", in Shapiro, A.F. and Jain, L.C. (Eds), *Intelligent and Other Computational Techniques in Insurance: Theory and Applications*, World Scientific Publishing, pp. 465-490, doi: 10.1142/9789812794246_0013.
- Guillen, M., Nielsen, J.P. and Pérez-Marín, A.M. (2008), "The need to monitor customer loyalty and business risk in the European insurance industry", *Geneva Papers on Risk and Insurance - Issues and Practice*, Vol. 33 No. 2, pp. 207-218, doi: 10.1057/gpp.2008.1.
- Guillen, M., Nielsen, J.P. and Perez-Marin, A.M. (2009), "Cross-buying behaviour and customer loyalty in the insurance sector", *Esic Market*, Vol. 132, January-April, pp. 77-105.
- Gupta, S., Lehmann, D.R. and Stuart, J.A. (2004), "Valuing customers", *Journal of Marketing Research (JMR)*, Vol. 41 No. 1, pp. 7-18, available at: <http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=11925397&site=eds-live>.
- Han, L., Li, D., Moshirian, F. and Tian, Y. (2010), "Insurance development and economic growth", *The Geneva Papers on Risk and Insurance - Issues and Practice*, Vol. 35 No. 2, pp. 183-199, doi: 10.1057/gpp.2010.4.
- Hilliard, J.I., Regan, L. and Tennyson, S. (2013), "Insurance distribution", in Dionne, G. (Ed.), *Handbook of Insurance*, 2nd ed., Springer, doi: 10.1007/978-1-4614-0155-1_25.
- Insurance Europe (2018a), *Database October 2018-Distribution*, available at: <https://www.insuranceeurope.eu/insurancedata>.
- Insurance Europe (2018b), *European Insurance – Key Facts*, Insurance Europe, October 2018, available at: <https://www.insuranceeurope.eu/european-insurance-key-facts>.
- Jeong, H., Gan, G. and Valdez, E.A. (2018), "Association rules for understanding policyholder lapses", *Risks*, Vol. 6 No. 3, p. 69, doi: 10.3390/risks6030069.
- Kofman, P. and Nini, G.P. (2013), "Do insurance companies possess an informational monopoly? Empirical evidence from auto insurance", *Journal of Risk and Insurance*, Vol. 80 No. 4, pp. 1001-1026, doi: 10.1111/j.1539-6975.2012.01487.x.
- Larsson, A. and Broström, E. (2019), "Ensuring customer retention: insurers' perception of customer loyalty", *Marketing Intelligence and Planning*, Vol. 38, pp. 151-166, doi: 10.1108/MIP-02-2019-0106.
- Leiria, M., deMatos, N. and Rebelo, E. (2020), "Non-life insurance cancellation: a systematic quantitative literature review", *Geneva Papers on Risk and Insurance: Issues and Practice*. doi: 10.1057/s41288-020-00187-2.
- Liedtke, P.M. (2007), "What's insurance to a modern economy?", *The Geneva Papers on Risk and Insurance - Issues and Practice*, Vol. 32 No. 2, pp. 211-221, doi: 10.1057/palgrave.gpp.2510128.

- Liljander, V., Polsa, P. and van Riel, A. (2009), "Modelling consumer responses to an apparel store brand: store image as a risk reducer", *Journal of Retailing and Consumer Services*, Vol. 16 No. 4, pp. 281-290, doi: 10.1016/j.jretconser.2009.02.005.
- Lopes, L., Brito, C. and Alves, H. (2015), *Dissolução e reativação de relacionamentos no contexto dos serviços Business-to-Consumer [Universidade do Porto]*, available at: <https://www.rcaap.pt/detail.jsp?id=oai:bibliotecadigital.ipb.pt:10198/12735>.
- Miotto, A.P. and Parente, J.G. (2015), "Retail evolution model in emerging markets: apparel store formats in Brazil", *International Journal of Retail and Distribution Management*, Vol. 43 No. 3, pp. 242-260, doi: 10.1108/IJRDM-03-2012-0025.
- Mirzamohammadi, S. and Hamid, M. (2019), "Optimization of customers' trust in the insurance industry by data envelopment analysis: an actual case study", *3rd Eu International Conference on Industrial Engineering and Operations Management, IEOM 2019*, July, pp. 990-998, available at: <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85079486826&partnerID=40&md5=13eeb110267f1c7057072f4df97dbfa7>.
- Naujoks, H., Brettel, T., Singh, H., Darnell, D. and Schwedel, A. (2017), *Customer Behavior and Loyalty in Insurance: Global Edition*, available at: <https://www.bain.com/insights/customer-behavior-loyalty-in-insurance-global-2017>.
- OECD. (2020), *Global Insurance Market Trends 2019*, available at: <https://www.oecd.org/daf/fin/insurance/Global-Insurance-Market-Trends-2019.pdf>.
- Paredes, M. (2018), "A case study on reducing auto insurance attrition with econometrics, machine learning, and A/B testing", *2018 IEEE 5th International Conference on Data Science and Advanced Analytics (DSAA), Data Science and Advanced Analytics (DSAA), 2018 IEEE 5th International Conference on, DSAA*, pp. 410-414, doi: 10.1109/DSAA.2018.00053.
- Pick, D. (2014), "Switching is easy'-service firm communications to encourage customer switching", *Journal of Retailing and Consumer Services*, Vol. 21 No. 4, pp. 502-509, doi: 10.1016/j.jretconser.2014.03.007.
- Pinquet, J., Guillen, M. and Ayuso, M. (2011), "Commitment and lapse behavior in long-term insurance: a case study", *Journal of Risk and Insurance*, Vol. 78 No. 4, pp. 983-1002, available at: <http://search.ebscohost.com/login.aspx?direct=true&db=heh&AN=67365249&site=eds-live>.
- Reichheld, F.F. (1996), "Learning from customer defections", *In Harvard Business Review*, Vol. 74 No. 2, pp. 56-67, available at: <http://search.ebscohost.com/login.aspx?direct=true&db=heh&AN=9603067619&site=eds-live>.
- Reuss, A.L. (2002), "Statistical prediction of cancellation behavior among holders of motor insurance contracts in Germany", Masters thesis, San Diego State University.
- Robson, J. and Sekhon, Y. (2011), "Addressing the research needs of the insurance sector", *International Journal of Bank Marketing*, Vol. 29 No. 7, pp. 512-516, doi: 10.1108/02652321111177795.
- Robson, J., Sekhon, Y. and Ning, H.S. (2016), "Understanding the strain of inter-personal relationships on employees", *Journal of Business and Industrial Marketing*, Vol. 31 No. 8, pp. 995-1003, doi: 10.1108/JBIM-10-2016-272.
- Roy, S. (2012), "Brand loyalty in insurance companies", *Journal of Economic Development, Management, IT, Finance and Marketing*, Vol. 4 No. 1, pp. 12-26, available at: <http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=67468711&site=eds-live>.
- Short, P.F., Graefe, D.R. and Cathy, S. (2003), "Churn, churn, churn: how instability of health insurance shapes America's uninsured problem", *Issue Brief (Commonwealth Fund)*, No. 688, pp. 1-16, available at: <http://search.ebscohost.com/login.aspx?direct=true&db=mnh&AN=14621666&site=eds-live>.
- Staudt, Y. and Wagner, J. (2018), "What policyholder and contract features determine the evolution of non-life insurance customer relationships?: A case study analysis", *International Journal of Bank Marketing*, Vol. 36 No. 6, pp. 1098-1124, doi: 10.1108/IJBM-11-2016-0175.

-
- Swiss Re Institute (2017), *Sigma 3/2017*, available at: <https://www.swissre.com/institute/research/sigma-research/sigma-2017-03.html>.
- Swiss Re Institute (2019), *Sigma 3/2019*, available at: <https://www.swissre.com/institute/research/sigma-research/sigma-2019-03.html>.
- Taylor, S.A. (2016), "Attitude and gender as predictors of insurance loyalty", *International Journal of Psychology and Behavioral Sciences*, Vol. 6 No. 3, pp. 99-102, doi: 10.5923/j.ijpbs.20160603.01.
- Twing-Kwong, S., Albaum, L.G. and Fullgrabe, L. (2013), "Trust in customer-salesperson relationship in China's retail sector", *International Journal of Retail and Distribution Management*, Vol. 41 No. 3, pp. 226-248, doi: 10.1108/09590551311306264.
- Venkatesan, R. and Kumar, V. (2004), "A customer lifetime value framework for customer selection and resource allocation strategy", *Journal of Marketing*, Vol. 68 No. 4, pp. 106-125, available at: <http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=14343255&site=eds-live>.
- Verhoef, P.C. and Commandeur, H. (2001), *Driving Customer Equity, How Customer Lifetime Value is Reshaping Corporate Strategy*, Roland T. Rust, Valarie A. Zeithaml, Katherine N. Lemon, The Free Press, New York; (2000), 292, *Long Range Planning*, 34(6), pp. 759-762, doi: 10.1016/S0024-6301(01)00091-7.
- Verhoef, P.C. and Donkers, B. (2005), "The effect of acquisition channels on customer loyalty and cross-buying", *Journal of Interactive Marketing*, OP-Journal Of Interactive Marketing (John Wiley and Sons), Spring2005, Vol. 19 No. 2, pp. 31-43, doi: 10.1002/dir.20033.
- Weisbart, S. (2018), "How insurance drives economic growth", available at: <https://www.iii.org/sites/default/files/docs/pdf/insurance-driver-econ-growth-053018.pdf>.
- Wirtz, J., Xiao, P., Chiang, J. and Malhotra, N. (2014), "Contrasting the drivers of switching intent and switching behavior in contractual service settings", *Journal of Retailing*, Vol. 90 No. 4, pp. 463-480, doi: 10.1016/j.jretai.2014.07.002.
- Woodham, O.P., Hamilton, M.L. and Leak, R.L. (2017), "I know what i like, i like what i know: how breadth of brand experience and cognitive effort influence brand switching", *Journal of Marketing Theory and Practice*, Vol. 25 No. 2, pp. 141-159, doi: 10.1016/S1057-7408(07)70037-2.

Corresponding author

Manuel Leiria can be contacted at: manuel.m.leiria@gmail.com

The current issue and full text archive of this journal is available on Emerald Insight at:
<https://www.emerald.com/insight/2444-8494.htm>

Identification of factors and outcomes of trust in mobile supply chains

Factors and
outcomes of
trust in MSCs

325

Nassim Ghondagsaz

*Boysen-TU Dresden-Research Training Group, TU Dresden, Dresden, Germany and
Institute of Media and Communication Science, TU Dresden, Dresden, Germany, and*

Sven Engesser

Institute of Media and Communication Science, TU Dresden, Dresden, Germany

Received 27 May 2021

Revised 29 July 2021

16 August 2021

Accepted 21 August 2021

Abstract

Purpose – The main purpose of this paper is the identification of the conceptualization of trust as well as its factors and outcomes in interorganizational relations in mobile supply chains (MSCs) in which multiple stakeholders collaborate.

Design/methodology/approach – The authors first used a comprehensive literature review to extract related factors and outcomes of trust. Second, the authors conducted semi-structured interviews in chemical and pharmaceutical companies in Germany. These organizations stand out as leaders in the concept of MSCs and have developed collaborations with various stakeholders.

Findings – Based on the results, a conceptual model has been developed that elaborates on the nature of trust and its factors and outcomes for cultivating trustful stakeholder collaboration. The study identifies six factors or approaches for building trust and two outcomes resulting from mutual trust.

Practical implications – The conceptual model presented in this study can serve as a basis for developing trust in MSCs. Interorganizational collaborations in MSCs are more successful when saturated with trust. The collaboration systems must allow the innovative organizations to create value through the adaptation of advanced technologies without failure.

Originality/value – The study adds to the body of knowledge in building trust in multiple stakeholder collaboration, particularly in innovative organizations which are involved with disruptive technologies.

Keywords Interorganizational trust, Information sharing, Stakeholders, Mobile supply chain, Supply chain collaboration, Sustainable production

Paper type Research paper

1. Introduction

The existence of trust, or lack thereof, has always been a critical factor for the success of supply chains. Partners need to establish a trustful environment to form strategic alliances (Frydinger *et al.*, 2019). Past research has described trust as a multidimensional concept due to the paradoxical nature of relationship marketing: to be a strong rival in the global economy requires one to be a trusted cooperator (within various trade networks) (Akrouit and Diallo, 2017; Fawcett *et al.*, 2017). With the right mentality, the development of functional competition becomes a mutual goal for the parties rather than an adversarial challenge (Agarwal and Narayana, 2020;

© Nassim Ghondagsaz and Sven Engesser. Published in *European Journal of Management and Business Economics*. Published by Emerald Publishing Limited. This article is published under the Creative Commons Attribution (CC BY 4.0) licence. Anyone may reproduce, distribute, translate and create derivative works of this article (for both commercial and non-commercial purposes), subject to full attribution to the original publication and authors. The full terms of this licence may be seen at <http://creativecommons.org/licenses/by/4.0/legalcode>

The authors would like to thank the Boysen-TU Dresden-Research Training Group for the financial support that has made this publication possible. The Research Training Group is co-financed by TU Dresden and the Friedrich and Elisabeth Boysen-Foundation.

This paper forms part of a special section “Innovation, Management, and Governance for Sustainable Growth”, guest edited by Alba Yela.



European Journal of Management
and Business Economics
Vol. 31 No. 3, 2022
pp. 325-344
Emerald Publishing Limited
e-ISSN: 2444-8494
p-ISSN: 2444-8451
DOI 10.1108/EJMBE-05-2021-0155

Aslam *et al.*, 2021). The absence of trust in interorganizational relationships, if not actively counteracted, can become an obstacle to collaboration in logistics, resulting in higher levels of transactional costs and lower levels of efficiency and productivity (Pomponi *et al.*, 2015).

A current global megatrend is seeing manufacturers across the globe develop innovative production systems which are more environmentally friendly. Recent studies show that developments of concepts such as location independent manufacturing (Lohtander *et al.*, 2017), modular production (Baldea *et al.*, 2017) and factory-in-a-box (Jackson *et al.*, 2008) represent just some of the new concepts within *mobile supply chains (MSCs)*, where the production facilities can be transported in portable containers to provide real-time services at the location of the customer. This novel concept enables manufacturers to enhance adaptability, flexibility and reconfigurability of their production processes and decrease their transportation costs and CO2 footprint (Shahmoradi-Moghadam and Schönberger, 2021). Moreover, in MSCs, where advanced technologies are combined to “enable anything to be made anywhere” (Fox, 2019), a relatively high degree of risk and uncertainty can emerge due to the dynamic and complex features of this form of supply chain (Allman and Zhang, 2020).

Here, various involved stakeholders can pose significant challenges for building effective collaboration and trust, both of which are considered as critical for lowering the level of risk and uncertainty (Barrane *et al.*, 2020). The difference between MSCs and the previously mentioned concepts is that manufacturing processes in MSCs are not in-house, which enables various stakeholders to take part in the decision-making process. This can lead to new business models in which the production lines can be shared among different stakeholders by means of leasing or renting production units. The complexity of a multi-stakeholder MSCs process is increased by the network of organizations, groups and individuals connected directly and indirectly through continuous or partial involvement in an MSCs (Ndubisi *et al.*, 2020; Shahmoradi-Moghadam and Schönberger, 2021). Indeed, the MSCs concept depends strongly on the degree of relational stability and alliance performance in the network. The core of this relationship’s durability is “trust-building” among various stakeholders (Barrane *et al.*, 2020). Trust advances collaboration amongst partners and operational members and decreases ineffectiveness which arises from the opportunistic behavior of individual partners (Arvidsson and Melander, 2020; Fernando and Wulansari, 2020).

The recent literature on interorganizational trust has primarily focused on examining the importance of building trust and its impact on collaboration in supply chains. However, it fails to elaborate on the process of understanding, explaining or conceptualizing trust in building collaboration. Moreover, the existing literature lacks a complete understanding of how innovative companies who are applying Industry 4.0 in their production processes have managed to build and maintain trust with their partners (Savastano *et al.*, 2018). In addition, while there is existing literature on how buyer-supplier trust is built in traditional supply chains (Sarkar *et al.*, 2020), we do not know if the strategies for building trust and the consequences of maintaining trust would be different in the context of MSCs, where a digital environment is dominant. Nevertheless, a few studies have tried to explain how trust is understood and explained in this environment (Barrane *et al.*, 2020; Sarkar *et al.*, 2020), calling for more research to achieve a deeper understanding of the topic. To the best of our knowledge, there has been no exhaustive study on the discussion of trust dimensions and antecedents in the context of MSCs. Therefore, the present study fills the gap for the identification of the dimensions and antecedents of interorganizational trust in MSCs while building upon the available knowledge and distinguishing new opportunities for future research in this area. In this paper, we adopt a combined method. In the first stage of analysis, 17 empirical and review papers revealed various differences in both the operationalization and antecedents of building interorganizational trust. The results provided in this study clustered these dimensions and antecedents of trust to build a framework in order to understand the phenomenon of trust in the interorganizational context. In the second stage, a semi-structured interview with three

qualified experts from the pharmaceutical industry in Germany allowed us to gain more knowledge about the nature of trust and its elements in the context of MSCs. The findings enable an evaluation of similarities and differences of the two approaches. This study will not, thus, yield statistically significant results. Rather, they will be valuable to clarify and/or extend the existing theory (Pomponi *et al.*, 2015, p. 84). Therefore, the present study contributes to the study of supply chain trust in two ways. First, the main contribution of this study is the provision of a conceptual model that can serve as a basis for further empirical studies on interorganizational trust in the context of MSCs as well as multi-stakeholder collaboration. Second, we elaborate on the nature of trust, demonstrating dimensions and strategies for building and maintaining trust as well as the consequences of cultivating trust in both the existing literature and in MSCs. We also shed light on the differences between the results obtained from the existing literature and the interviews in terms of interorganizational trust. We conclude with specific recommendations and six strategies leading to the development of trust-enabled, collaborative interorganizational relationships.

The rest of this paper is as follows. The subsequent section discusses the review of the literature. This is followed by a section which describes the methodology behind the literature studies and semi-structured interviews. Finally, the paper ends with findings, a discussion and a conclusion.

2. Theoretical background

2.1 Trust definition and antecedents

Trust is a complex concept. It is a multidimensional and multifaceted communication phenomenon (Nematollahi, 2019; Paluri and Mishal, 2020). Various definitions of trust have been provided from different disciplines, such as marketing, management, supply chains, psychology, sociology and economics (see Table 1). From a marketing perspective, the seminal work by Morgan and Hunt (1994) examined the critical role of trust and commitment and their centrality in the success of relationship marketing. They argued that “trust exists when one party has confidence in an exchange partner’s reliability and integrity”. In the management discipline, Lui and Ngo (2004) suggested that trust is the expectation of a partner to fulfill a collaborative role in a risky situation, and (the reliability) of both the partner’s intention to perform and its ability to do so. From a supply chain perspective, Lee and Zhong (2020) stated that trust between two stakeholders in a supply chain relationship contains two components, namely credibility and benevolence. Credibility indicates the firm’s belief in the ability of the partner to perform their promise accurately, and benevolence refers to the belief that the supplier takes into consideration the buyer’s welfare and interest in their interorganizational trust.

Wu *et al.* (2017) conceptualized trust as a two-dimensional structure, including calculative trust and relational trust. Akrouf and Diallo (2017) categorized trust according to the different stages of trust development: calculative trust, cognitive trust and affective trust. Levels of trust can be classified as weak, semi strong and strong. Therefore, trust is defined as a willingness to expose yourself to risk (Ryciuk, 2017). In sociological research, trust entails the effect of history, culture and organizations on humans in a particular social context. Economists usually evaluate trust from a transaction cost and game theory perspective (Pech and Swicegood, 2013; Wu *et al.*, 2017). Frydinger *et al.* (2019) outlined the process of building long-term strategic partnerships under the foundation of trust through “formal relational contracts”, in which five steps were drafted. These steps are related to establishing a problem-solving mentality rather than negotiations mentality, creating a jointly shared vision, adopting six “guiding principles: reciprocity, autonomy, honesty, loyalty, equity and integrity”, lining up objectives and expectations and, finally, maintaining the relational contract through continuous monitoring.

References	Definitions of trust	Factors and outcomes
Agarwal and Narayana (2020)	Trust is operationalized as benevolence and integrity	<i>Factors:</i> Information quality, information sharing, information frequency and relationship commitment <i>Outcomes:</i> Relationship satisfaction
Akrout and Diallo (2017)	- Calculative trust: cautious behaviors underlying deterrent sanctions - Cognitive trust: predicting the other party's behaviors - Affective trust: empathy, security and emotional bonds	<i>Factors:</i> Reputation, conflict resolution, sympathy and shared values <i>Outcomes:</i> Relationship investment and confidential communication
Chen <i>et al.</i> (2011)	A willingness to rely on an exchange partner	<i>Factors:</i> Information availability, information sharing, information quality, country and behavioral uncertainty <i>Outcome:</i> Commitment
Daudi <i>et al.</i> (2016)	Behavioral trust comprises of partner's actions and interactions occurring during collaboration, and whose outcome can predictively be estimated	<i>Factors:</i> Information sharing, incentive alignment, decision synchronization and opportunism <i>Outcomes:</i> –
Ford <i>et al.</i> (2020)	Willingness to be vulnerable to others	<i>Factors:</i> Reputation, communication, service quality/satisfaction, shared norms and values, negative past behaviors, fairness and cooperation
Handfield and Bechtel (2002)	Goodwill/affect-based dimensions antagonistic/cooperative, distrust/trust and harmony/discord	<i>Factors:</i> Contracts, site specific asset, human specific asset and buyer dependent <i>Outcomes:</i> Responsiveness
Kwon and Suh (2004)	Trust exists when a firm believes its partner is being honest and benevolent	<i>Factors:</i> Asset specificity, behavioral uncertainty, Information sharing, perceived satisfaction, partner's reputation and perceived conflict <i>Outcomes:</i> Commitment
Lee and Zhong (2020)	Benevolence trust and competence trust	<i>Factors:</i> Bayer's dependence on supplier <i>Outcomes:</i> Contractual bonds and relational exchanges
Lui and Ngo (2004)	Goodwill, competency and contractual safeguards	<i>Factors:</i> Prior relationship, size difference and asset specificity <i>Outcomes:</i> Completion time and performance satisfaction
Morgan and Hunt (1994)	Trust exists when one party has confidence in an exchange partner's reliability and integrity	<i>Factors:</i> Opportunistic behavior, communication and shared values <i>Outcomes:</i> Relationship commitment
Nicolaou and McKnight (2006)	One believes that the partner is honest, benevolent and competent	<i>Factors:</i> Perceived information quality and disposition to trust <i>Outcomes:</i> Intention to use and perceived risk
Nyaga <i>et al.</i> (2010)	Keeping the other partner's best interest in mind and considering their welfare	<i>Factors:</i> Information sharing and joint relationship effort <i>Outcomes:</i> Satisfaction with relationship and performance

Table 1.
Definition of trust, antecedents, and outcomes

(continued)

References	Definitions of trust	Factors and outcomes
Ryciuk (2017)	Trust is honesty, reliability, integrity, dependability, promise keeping and behavior consistent with expectations	<i>Factors:</i> Partner characteristics (reputation in quality and financial situations as well as well-known brand), relationship formalization (contracts) and poor bargaining position <i>Outcomes:</i> Cooperation, goodwill manifestation and specific investments
Salam (2017)	Trust in the degree to which partners perceive each other as credible and benevolent	<i>Factors:</i> Mutuality and reciprocal loyalty <i>Outcomes:</i> Collaboration
Wu <i>et al.</i> (2017)	Calculative trust; relational trust	<i>Outcomes:</i> Lower (relationship, task and process) conflict and added value
Barrane <i>et al.</i> (2020)	The study conceives trust to include two dimensions namely, credibility and benevolence	<i>Factors:</i> Long-term relationship, transparency, appropriate partner and informal conversations <i>Outcome:</i> Trustful multi-stakeholder collaboration in digital environment
Zhong <i>et al.</i> (2017)	The extent of trust placed in the partner organization by the members of a focal organization	<i>Factors:</i> Asset specificity, relationship duration, dependence and external uncertainty

Table 1.

Researchers across different disciplines suggest a variety of factors and outcomes to understand trust development and maintenance (Ford *et al.*, 2020). Chen *et al.* (2011) showed a positive effect of information availability, information sharing, information quality and behavioral uncertainty on trust. They indicated that the level of commitment is strongly related to the level of trust. Agarwal and Narayana (2020) examined the effect of three dimensions of relational communication (information sharing, information quality and information frequency) on social exchange constructs, namely trust, commitment and satisfaction. They concluded that these three dimensions are positively related to a buyer's satisfaction with the mediating role of trust.

2.2 Mobile supply chain

In production technology, the main focus is placed on technical aspects. Such methods are quite standardized. In industrial engineering and management, the primary focus in research is economy of scale in production. Environmental studies concentrate mainly on CO₂ footprints and pollution emitted from industrial and production sources (Peltokoski *et al.*, 2017). The MSCs concept tries to combine these research disciplines into a practical model.

The MSCs concept is an innovative concept that is not yet widely implemented. The main idea of MSCs is to build a production unit composed of various modules which can be mobile and movable, e.g. sea containers. There are several possible forms of the MSCs concept: it can be a movable assembly unit, mobile maintenance unit, a mobile service unit, a mobile power unit or a mobile production line. The concept of a mobile factory in itself is not a novel idea as it has been widely applied in mobile healthcare systems (e.g. mobile blood donations (Haghjoo *et al.*, 2020)), energy and power (e.g. Siemens floating power plant), mobile libraries, fruit processing factories (Peltokoski *et al.*, 2017) and mobile bio-oil refineries (Mirkouei *et al.*, 2016).

In research, several background concepts have provided the foundation for MSC: industrial assembly and manufacturing systems (Rosell, 2004), distribution manufacturing systems (DMS) (Matt *et al.*, 2015), mobile production and manufacturing systems (MMS) (Alix *et al.*, 2019), factory-in-a-box (Hedelind *et al.*, 2007) and location independent manufacturing

(LIM) (Peltokoski *et al.*, 2017). Several studies, when referring to mobile supply chain management (mSCM) seemed occupied with the implementation of mobile and/or wireless technology in the supply chain (Cagliano *et al.*, 2017; Chan and Yee-Loong Chong, 2013; Eng, 2006; Pan *et al.*, 2013). However, in this study, mobility is related to production sites and facilities. It can be assumed that the use of wireless technologies is a necessary prerequisite for exchanging production information within MSCs.

According to (F3 factory, 2013) project research, the fundamentals and basis for implementing MSCs are mainly modular population and fully automated production lines. Modularity has been defined as “the synergistic combination of fundamental functions (tasks) into a single equipment, e.g. reactive distillation, spinning disk reactors and membrane distillation” (Baldea *et al.*, 2017). The concept of modular production has come about as one of the consequences of the modern process industry, whereby advanced technologies enable more flexible and customized responses to rapidly changing consumer demand. This results in greater diversity of product range, thereby increasing the demand for manufacturing technologies and equipment (Öberg, 2019). One significant benefit of modular production is the increased flexibility of production capacity, which can be influenced by fluctuating parallel modules. Moreover, modules can be easily orchestrated and combined, as well as easily installed due to practical plug-and-produce models.

Fox, (2015) has stated that three various types of mobile factories exist:

- (1) “Individual mobile factory”: located on a truck, used for shorter durations in a temporary location, e.g. fruit processing factories, mobile food truck and mobile libraries.
- (2) “Sets of movable factories”: including more than one production unit and used for longer durations in a location.
- (3) “Modular factories”: consisting of various modules in combination to provide one production line.

Selection of the appropriate type can be made based on the time, demand, products and production processes. The MSCs concept has many features which are similar to earlier concepts found in the literature, such as factory-in-a-box and LIM. For example, the similarities between the MSCs concept and previously developed concepts include the following: composed of standardized manufacturing modules, located in a movable container or truck and providing services to geographically dispersed end-consumers (See Figure 1), with both concepts requiring flexible and reconfigurable systems. MSCs democratizes previous concepts by transferring the decision-making to multiple stakeholders, meaning the decisions affecting mobile containers cannot be made by only one stakeholder.

2.3 Importance of trust in mobile supply chains

In the concept of MSCs, advanced technologies and Industry 4.0 foster an environment to easily collaborate and share information (Oghazi *et al.*, 2018). The collaboration in MSCs is associated with a mobile production process, location, production volume (Becker *et al.*, 2019), raw materials, market data, information exchange, knowledge sharing, employee rights, legislations (Peltokoski *et al.*, 2017) and resources between the network stakeholders to attain economical co-creation value. The allocation of tasks and responsibilities among stakeholders (“corporate governance”) has recently drawn attention as an issue of concern in many countries (Palaniappan, 2017). In this regard, previous studies have highlighted that multiple stakeholder collaborations have a positive impact on a firm’s performance (Driessen and Hillebrand, 2013).

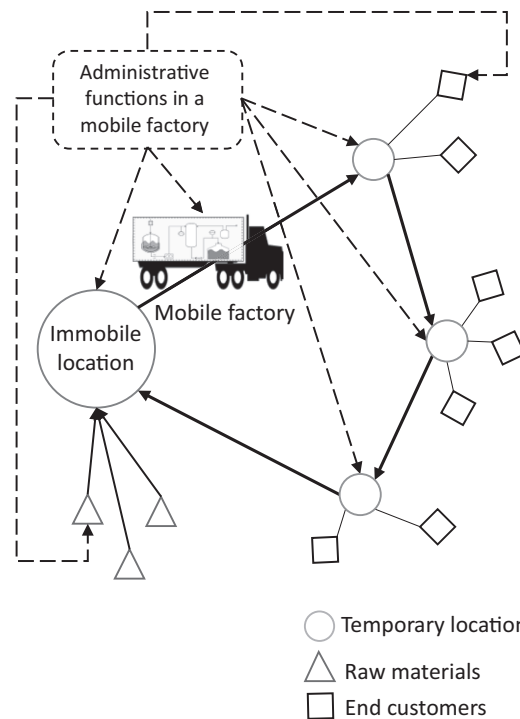


Figure 1. Mobile Supply Chain's decentralized location and administrative functions

However, the collaboration system can be quite complicated and sometimes distorted by distrust and destructive conflicts (Barrane *et al.*, 2020). The use of advanced technologies in MSCs represents an excellent opportunity to cope with this complexity and to establish a smart and novel manufacturing framework (Baldea *et al.*, 2017; Oghazi *et al.*, 2018). The design, material, components and manufacturing can each originate from different stakeholders (including from different countries), which makes controlling the process more complex (Lohtander *et al.*, 2017). Indeed, the MSC's process depends strongly on the degree of relational stability and alliance performance within the network. The core of this relationship durability is "trust-building" among various stakeholders (Barrane *et al.*, 2020; Yang *et al.*, 2008). Moreover, a lack of trust is sensed more in complicated scenarios, where mobile factories change locations based on the decision of different stakeholders, and the process is carried out remotely without face-to-face communication between individuals and groups (Barrane *et al.*, 2020; Wooliscroft and Ganglmair-Wooliscroft, 2018). Trust boosts cooperation between stakeholders and operational members, increases their commitments (Kwon and Suh, 2004) and decreases ineffectiveness arising from the opportunistic behavior of partners. Furthermore, previous studies have shown that trust becomes more crucial in relationships with greater risk and uncertainties, such as in the context of MSCs when the risks and transaction costs are very high (Ndubisi, 2010; Zafari *et al.*, 2020). In sum, it has been noticed that companies which are considered trustworthy maintain higher levels of performance and can be associated with a long-term competitive advantage (Cappiello *et al.*, 2020). The recent literature lacks a complete understanding of how innovative companies which have adopted Industry 4.0 and disruptive technologies

within their production process are handling this situation. This study elaborates on the trust-building process among collaborative partners in such circumstances.

3. Methodology

In this study, we seek to determine major strategies for building trustful relationships in the concept of MSCs. For this purpose, we began with a comprehensive literature review to extract related factors and outcomes of trust. Second, the authors conducted a semi-structured interview with key personnel in German chemical and pharmaceutical organizations in charge of MSCs. Semi-structured interviews contribute to the thorough exploration of the subject by posing questions that motivate the participant to provide their thoughts, experience and attitude (Barrane *et al.*, 2020). Moreover, it helps researchers to collect data from a real-world perspective.

3.1 Literature search

We conducted a comprehensive search for empirical and review studies investigating a correlation between antecedents and consequences of trust, as well as providing a definition of the nature of trust. To identify related studies, we first searched computerized databases including Science Direct, ProQuest, Google Scholar and Emerald utilizing several keywords. These databases hold valuable publications in the area of supply chains, collaboration and trust. We included only published peer-reviewed journal articles. This was aimed at increasing the quality of the search following Delbufalo (2012). Appendix 2 shows the procedures utilized to identify the reviewed articles. The search was carried out in the mentioned databases using the search keywords, resulting in a total of 1,511 articles published between 1990 and 2021, inclusively. After eliminating the duplicated articles, we scanned the titles, abstracts and keywords of 1,454 articles based on their focus on trust in the context of supply chain management (SCM) or trust in Industry 4.0 supply chains. This step is preferred because the full-text contents of articles are less dedicated to defined keywords in comparison with those in title, abstract and keywords. This screening filters the previous 1,454 collected articles to 201 articles to be reviewed in full text. Subsequently, inclusion and exclusion criteria were utilized to screen the articles for relevancy. With the initial practical screening, each study had to cover interorganizational trust as a core of its analysis. Studies that considered interpersonal trust, intraorganizational or supplier-customer trust were excluded. Following this screening process, remaining studies had to investigate or evaluate either antecedents or outcomes of trust. Studies that solely covered the nature of trust were excluded. The screening process was followed by our methodological approach in which articles concentrating on optimization methods, game theory and blockchain were excluded. The reasoning here is that these articles do not focus on the nature of trust. We also applied a snowball approach and examined the reference lists of selected studies to ensure that no relevant papers were overlooked (Ford *et al.*, 2020). This step added five more articles to our final number of reviewed articles. In total, we identified 17 studies for the analysis of antecedents, outcomes and trust definition.

3.2 Qualitative interview

Semi-structured interviews were also carried out to compare and verify the outcome of the literature review with multiple case studies, as well as to collect various opinions regarding the state of the art of MSCs. We selected two companies which are regarded as pioneers and leaders in innovative pharmaceutical production in Germany. The target population comprises of three top-ranked executives who hold top positions in their firms and are responsible for controlling the MSC and modular production. Since an important aspect of

this research is to strengthen the German process industry, all experts have their main research area and headquarters in Germany. We guarantee the anonymity of all respondents throughout the study process by allocating non-descript alphabetical identifier codes to each participant. An interview guide with six open-ended questions was prepared to manage the discussions with the experts. The interview questions are provided in Appendix 1.

The objective of the interviews was to empirically examine the trust definition, as well as its factors and outcomes. The interview protocol was designed based on the literature and was used for all respondents. The semi-structured interviews began with a presentation of the concept of MSCs to familiarize the interviewee with the objectives and questions in the interview.

Interviews were held online due to COVID-19 restrictions and durations varied between 30 min and 1 h. To ensure the accuracy of the data and to ease the coding and interpretation, all interviews were recorded and subsequently transcribed.

3.3 Data analysis and interpretation

The selected articles were analyzed to identify the nature and antecedents of trust in the existing literature. The analysis was carried out using the MaxQDA tool following procedures outlined by Kuckartz and Rädiker (2019). The coding process for the analysis was accomplished by allocating categories and concepts to the different sections related to the research purposes. The analysis was interpreted and summarized through a qualitative data set synthesis process. According to Olugboye and Windapo (2019), data set synthesis makes it easier to understand a phenomenon through research collection. The synthesis process categorizes concepts into main subjects (nature of trust and antecedents) and identifies general opinions on the main subjects to ensure credibility. Following the literature review, we created a codebook and synthesized the responses. This enabled us to compare interviewees' responses and create categories to interpret the data. To increase the research reliability and validity, we controlled the interviews and documents repeatedly, compared them with the literature and asked an independent researcher, an expert in the field of modular production, to check them. Moreover, we created a database of collected data and findings (interview guide, interview description, online videos, transcription and codebooks). In the findings section, some relevant responses from the participants are included to enhance research validity.

4. Findings and discussion

4.1 Results from the literature review

Although the importance of trust has long been recognized in the literature related to interorganizational relationships, and various definitions of trust have been provided, three major dimensions of trust in the literature were mentioned quite often. The analysis was summarized graphically using a descriptive figure (see Figure 2). The three categories in terms of the nature of trust include honesty (35%), benevolence (45%) and competency (20%). Percentages show how often a dimension of trust was mentioned in the studied articles. The scholars provided various definitions for trust, but, as we elaborated on the nature and conceptualization of trust, it seems that the contexts behind these definitions are similar, and therefore, they can be grouped together with other categories. Therefore, in the group of honesty, we can consider other operationalizations of trust, such as "sincere" and "stand by their word".

The group of benevolence can also be defined as "goodwill", "interested in the firm's welfare" and "no unexpected actions". Competency can also be understood as the ability to do what a partner needs to be done or fulfilling promised role obligations. Besides these three

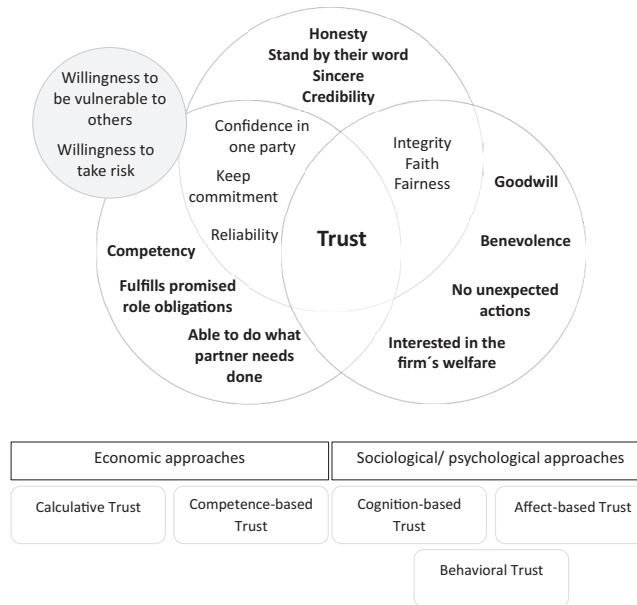


Figure 2. Conceptualizations of trust based on results from literature review

major groups, some scholars have identified trust as a willingness to be vulnerable to others. Moreover, various level-based definitions of trust have been considered, such as calculative trust, competence-based trust, affect-based trust and behavioral trust. The analysis suggests that calculative trust and competence-based trust are more concerned with economic approaches, while the others are more related to sociological/psychological approaches.

Moreover, the results of the literature review allowed for the proposal of various factors and outcomes related to establishing, evaluating, maintaining and developing trust in supply chain management. It seems that the multifaceted nature of trust can be observed in this stage as several constructs can have a reciprocal relationship with trust. For example, the relationship between trust and cooperation, trust and information sharing, and trust and conflict have all been suggested as being reciprocal. It shows that trust can be both a cause in some circumstances and partially an effect. This could explain why determining the nature of trust is a complicated concept to understand and study. In Figure 3, various antecedents and outcomes of trust are shown of which some belong to both groups. To summarize and analyze these antecedents and outcomes, we clustered four categories for factors (information, transaction cost, social exchange and governance) and four sections for outcomes (collaboration, cooperation, investment and responsiveness). Each factor and outcome has various components.

The following section presents the results of the expert interviews. These results enable a comparison with the existing literature and an evaluation of similarities and differences. This approach contributes to an elaboration of gaps in the literature where more research would be useful.

4.2 Results from semi-structured interviews

All participants admitted to the importance of including various partners in an MSC, but they also emphasized the challenges this entails. One of the respondents noted “our projects are very complex and we need good partners,” while another said: “. . . it is really tough”. The aim

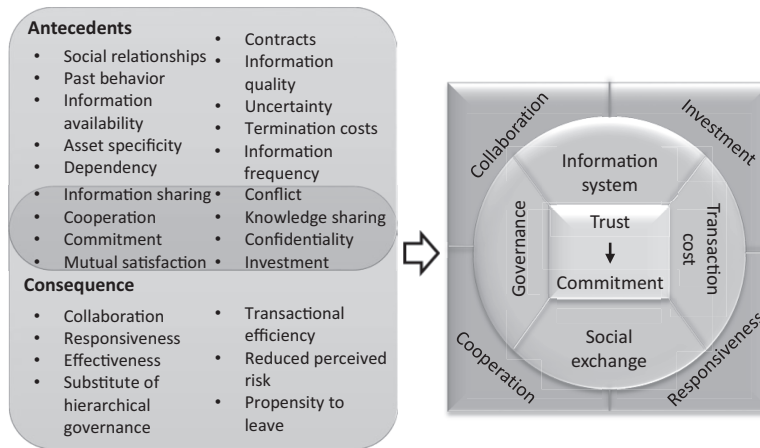


Figure 3. Antecedents and consequences of trust based on results from literature review

of the semi-structured interviews conducted with representatives of pharmaceutical companies was the identification of the nature of trust and the antecedents that are significant for establishing and maintaining interorganizational trust in MSCs (one benefit of expert interviews is the uncovering of aspects not previously considered by the researchers). Figure 4 summarizes our results in terms of dimensions, antecedents and outcomes of interorganizational trust in the context of MSCs.

The empirical results of the study show that trust is determined by honesty, credibility and trustworthiness components in these organizations. One of the respondents shared a similar view: trust is “the feeling if the partner will live up to their promises”. The results show that trust is mostly identified with performance according to promises, as well as confidence in one party. Another respondent remarked: “trust is defined as your partner delivering with agreed quality . . . they deliver in the agreed time”. The results confirmed the findings of previous studies (Nicolau and McKnight, 2006; Ryciuk, 2017), which defined trust as

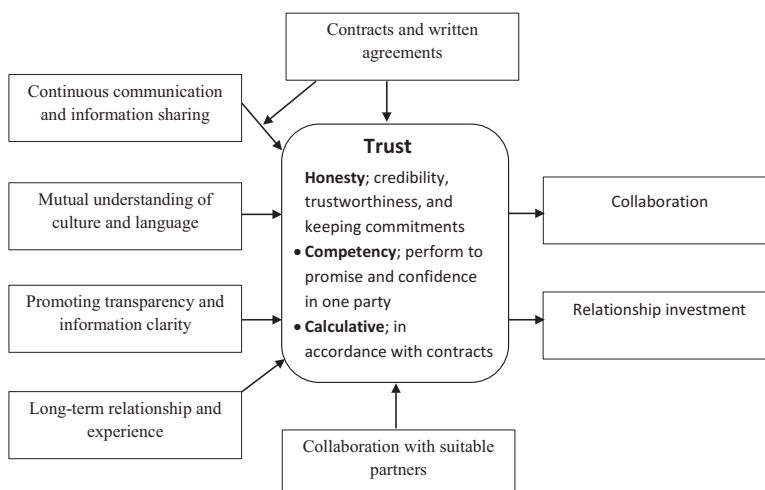


Figure 4. Dimensions, factors, and outcomes of interorganizational trust in mobile supply chains

honesty and integrity. Another respondent noted: “we have to get from the vendor what we want”, which implies that trust can be defined as competency, keeping commitments, the ability to do what the partner needs to be done and fulfilling promised responsibilities properly. These results are consistent with some findings from the existing literature (Lee and Zhong, 2020). Trust also implies a belief that the partner will carry out their responsibilities according to the agreements and contracts. One of our respondents remarked: “If it is clearly defined in the contract that certain information is not shared, then it has no negative impact on trust”. This illustrates the fact that an enormous portion of trust comes from contractual safeguards provided by these agreements. This component of trust has also been emphasized in previous studies (Akrouf and Diallo, 2017; Beuve and Saussier, 2012). Calculative trust provides security in the presence of opportunistic behavior, thereby resulting in decreasing transaction costs in the relationships (Akrouf and Diallo, 2017) and contributing to the maintenance of trust. Comparing the results from the semi-structured interviews with previous studies, it is obvious that the significant difference between traditional supply chains and MSCs in terms of trust dimensions is the benevolence component of trust, which was mainly emphasized in the existing literature but not mentioned by our respondents. Benevolence means the partner considers the goodwill and interest of the firm and acts accordingly. One major difference between the existing literature and the findings of our interviews is that benevolence is not as important as the other two trust components (honesty and competency). This finding mainly contradicts previous studies as benevolence was the most often mentioned component of trust. The reason for the lower importance of benevolence in the MSCs context could be the complex nature of these projects, which requires one party to stick to the contracts, have the ability to fulfill the firm’s expectation and keep their promises, as one small act of opportunistic behavior can result in large risk exposure. To understand how partners can build and maintain trust in MSCs, the interviews followed up by asking the respondents about their approaches.

According to the interview participants, the main factors or approaches cultivating trust in interorganizational relationships within MSCs include:

- (1) *Continuous communication and information sharing*: our respondents emphasized the importance of frequent sharing of information among partners in an MSC. However, the amount of shared information depends on the level of integration. In some scenarios, where a partner (supplier) produces a specific raw material for another partner through mobile manufacturing, they need a high level of interaction in which a great amount of information should be exchanged to provide effective communication in order to build trust. According to the type of information, one of our respondents remarked: “. . . the interaction could be intense because your production depends on information from my production stages. So what capacity I am running, how pure my product is, do I have any side components you know that basically makes my product dirty . . . all these types of information would be required for you to run your asset in an optimal way”. In another scenario, where the partner requires a product or a service that can be provided with the least amount of shared information, a lower level of integration emerges. As one of our respondents stated “. . . it is not uncommon that if you need pressurized air, so somebody is running a compressor for you, so that you get air as an energy supplier . . . X company would not let you know what exactly is happening in their mobile plant”. In the literature (Chen *et al.*, 2011; Daudi *et al.*, 2016), the positive impact of information sharing on trust has been emphasized repeatedly, but these studies did not elaborate on scenarios where information is not shared. Subsequently, the reason for not sharing information and the effect that would have on trust have not been examined. Our results show that information sharing is essential for building trust in MSCs, but it depends on the level of

integration experienced. In scenarios where information needs to be shared extensively, and a partner refrains from sharing, the level of trust will decrease. In another scenario, where partners agree to share a minimum level of information, there would be no negative effect on the level of trust. The findings show that as the level of integration among partners increases, the need for building a trustful relationship enhances because they should share a high level of information to build trust but should also maintain confidentiality.

- (2) *Contracts and written agreements*: all participants frequently highlighted the importance of contracts in interorganizational relationships. It seems that contracts play a major role when partners encounter challenges in their relationship. For example, as one of our respondents claimed, when a partner requires more information in order to operate the mobile plant, the decision of sharing information depends on the contract terms. One respondent stated: “*that has to be negotiated like any other part of the contract*”. Contracts are legal mechanisms that clearly define the terms of interorganizational relationships. Even when a high level of trust exists among partners, an assurance of trust may be required by formal agreements and organizational responsibilities (Beuve and Saussier, 2012; Yuan *et al.*, 2018). But these studies did not show that contracts can serve as a mediating variable between information sharing and trust. As the other participant claimed “*if it is clearly defined in the contract that certain information is not shared, then I think it has no negative impact on the trust*”.
- (3) *Promoting transparency and information clarity*: Transparency generates trust, particularly when partners have open and continuous communication and the sharing of required information takes place. Transparency implies the degree to which the MSC’s targets, responsibilities, definition and level of integration are explicit and exchanged by all stakeholders and partners involved in the project (Barrane *et al.*, 2020). To increase transparency, respondents suggested focusing on legal agreements, building a definite protocol of roles and responsibilities and developing a secure sharing of information. All these efforts help to build a trusting collaboration. Information transparency was highlighted as an important factor in creating trust and maintaining commitments by one of our respondents “*If there is some ambiguity about what information is shared, then it can become a trust issue.*”
- (4) *Long-term relationship and experience*: participants claimed that long-term relationships and experience with stakeholders facilitate the trust-building process, and that trust results in greater relationship investment. Partners with a high level of collaboration share risks and benefits as well as profits with trusted partners who do not act opportunistically (Ndubisi, 2010). In this regard, a participant remarked: “*trust is a level of engagement between two partners that is based on several experiences*”.
- (5) *Collaboration with suitable partners*: in MSCs, various stakeholders need to collaborate in order to add value to the projects. These stakeholders vary from clients, suppliers, research centers and universities and functional internal groups, to operational, tactical and strategic managers. In the context of collaboration, trust depends on each partner’s experiences, competencies, attitude and role in the relationship. Therefore, partners with the proper combination of these characteristics infuse reliance and are trusted by participants in the network to add significant value in MSCs. In the same context, one of the participants noted that “*we need good partners . . . he has to help us otherwise we have a problem*”. As claimed by the participants, the current situation of MSCs, where significant research still needs to be undertaken, necessitates selecting proper research groups from universities or research institutes.

- (6) *Mutual understanding of culture and language*: some participants mentioned “*culture*” and “*language*” as critical elements for building trustful collaboration. This finding is consistent with the fundamentals of MSCs, where globalization is a key component. The basis of the MSCs concept is moving mobile factories to different locations close to the end customers. These mobile factories can even be transported across national borders. In this regard, the local culture and language are crucial for building trust in individuals and groups working together remotely.

The respondents stressed the effect of trust on collaboration (“... that is necessary to cooperate ...”) and relationship investment. As the concept of MSCs is a new approach in manufacturing and modular production, there is great demand for further research and studies. The findings here show that building and maintaining mutual interorganizational trust can further increase the level of investment in both the relationship and in the research projects. This increasing investment can lead to better understanding and implementation of the concept of MSCs.

The results illustrated that trust plays a major role in establishing strategic collaboration among stakeholders in MSCs as the respondents emphasized the critical role of trust in building a long-term relationship with their partners. One of the respondents stated that “... *in an MSC, you have to work much closer because you have many more interfaces with your partner and that will only work if there is a common understanding and trust in each other*”. Most of the respondents agreed that the level of integration with their partners would be higher when they employ mobile factories in their manufacturing process, which leads to more complicated relationships. Another respondent has mentioned that “*the level of confidence and trust has to be much higher than when you are just providing products*”. This finding shows that the role of trust in MSCs is more significant than in traditional supply chains. The reason is that multi-stakeholders in MSCs cannot simply leave the relationship. In a traditional supply chain, when the product’s quality is low, the buyer can simply terminate the relationship and select another supplier; however, in MSCs, due to the high level of integration and asset investment, the partners’ propensity to leave is low. Therefore, they need to build a higher level of trust in their interorganizational relationship.

Comparing the results from the reviewed articles and semi-structured interviews, we noticed several similarities and differences in interorganizational trust between traditional supply chains and mobile supply chains. The findings show that, although three dimensions of trust in MSCs is similar to previous studies, the most significant component of trust, benevolence, was not defined in MSCs. This could be explained by the complex nature of MSCs, which requires one party to stick to the contracts, have the ability to fulfill the firm’s expectation and keep their promises as one small act of opportunistic behavior can result in large risk exposure. Therefore, the benevolence component, which means the partner considers the goodwill and interest of the firm, has a rather unimportant role in trust dimensions in MSCs. In addition, this study shows that the level of trust is higher in MSCs than traditional supply chains. The reason for that is the higher level of integration between partners. Moreover, we categorized the factors of trust based on the existing literature into four groups; however, the findings show that the firms should employ different strategies for establishing trust with their partners when they are entering into the MSCs, and the previous research cannot fulfill this requirement. This approach confirms the benefit of expert interviews, i.e. the uncovering of aspects not previously considered by the researchers.

5. Conclusion and research contributions

This study represents a contribution to the research of the nature of trust and its elements in multi-stakeholder collaboration. The research enabled the identification of the dimensions and elements of interorganizational trust from both the existing literature and from conducted semi-structured interviews. In the first stage of analysis, 17 empirical and review

papers revealed various differences in both the operationalization and antecedents of building interorganizational trust. The results provided in this study clustered these dimensions and antecedents of trust to build a framework in order to understand the phenomenon of trust in the interorganizational context. In the second stage, a semi-structured interview with two qualified managers from the pharmaceutical industry and one expert from academia allowed us to gain more knowledge about the nature of trust and its elements.

The study makes major theoretical contributions to the supply chain trust literature by providing a conceptual model that can serve as a basis for further empirical studies on interorganizational trust in the context of MSCs as well as multi-stakeholder collaboration. This study contributes to the present literature by showing how firms can establish trust in the context of stakeholder collaboration, such as within MSCs. It also shows the significant differences between traditional supply chains and mobile supply chains regarding the conceptualization of trust as well as the strategies of establishing trust. As suggested in previous studies, trust supports long-term interorganizational relationships and defines the duration and strength of marketing relationships (Barrane *et al.*, 2020). This study confirms this line of argument and further emphasizes the critical role of trust in strategic collaboration in MSCs, in addition to revealing six factors or approaches for building trust in the context of MSCs: continuous communication and information sharing, contracts and written agreements, promotion transparency and information clarity, long-term relationship and experience, selecting suitable partners and mutual understandings of culture and language. The findings highlight the importance of two major outcomes of long-lasting trust in multi-stakeholder MSCs, namely collaboration and relationship investment. The study adds to the body of knowledge in building trust in multiple stakeholder collaboration, particularly in innovative organizations which are involved with disruptive technologies.

As for the practical and managerial field, this study contributes in several ways. This study evaluates the trusting collaboration of multiple stakeholders. Since the concept of MSCs is somewhat novel, the body of the available literature is still somewhat limited. This study contributes to the advancement of research in this area by examining various information-sharing scenarios of MSCs and identifying the role of trust in this concept. Interorganizational collaborations in MSCs are more successful when saturated with trust. The collaboration systems must allow the innovative organizations to create value in a trusting environment through the adaptation of advanced technologies without failure. Overall, this study contributes to organizational communication and will thus be beneficial to communication scientists and supply chain managers considering trust-building measures as the integration of multiple stakeholders was considered and examined.

However, the results of our study should be interpreted keeping in mind several limitations that may guide future research. First, considering a limited number of participants in the semi-structured interview limits the generalizability of the results. Thus, we suggest that future research should employ a greater number of respondents. Second, considering one industry for our study may require caution when generalizing the findings. Furthermore, applying qualitative methodologies for analysis limits the generalizability of the results. Future studies are recommended to employ mixed-method approaches in order to analyze the findings both qualitatively and quantitatively. We suggest that future studies employ the conceptual model presented in this study in other industries to obtain more understanding of its validity and generalizability of the findings.

References

- Agarwal, U.A. and Narayana, S.A. (2020), "Impact of relational communication on buyer-supplier relationship satisfaction: role of trust and commitment", *Benchmarking: An International Journal*, Vol. 27 No. 8, pp. 2459-2496.

- Akrout, H. and Diallo, M.F. (2017), "Fundamental transformations of trust and its drivers: a multi-stage approach of business-to-business relationships", *Industrial Marketing Management*, Vol. 66, pp. 159-171.
- Alix, T., Benama, Y. and Perry, N. (2019), "A framework for the design of a reconfigurable and mobile manufacturing system", *Procedia Manufacturing*, Vol. 35, pp. 304-309.
- Allman, A. and Zhang, Q. (2020), "Dynamic location of modular manufacturing facilities with relocation of individual modules", *European Journal of Operational Research*, Vol. 286 No. 2, pp. 494-507.
- Arvidsson, A. and Melander, L. (2020), "The multiple levels of trust when selecting suppliers – insights from an automobile manufacturer", *Industrial Marketing Management*, Vol. 87, pp. 138-149.
- Aslam, J., Saleem, A., Khan, N.T. and Kim, Y.B. (2021), "Factors influencing blockchain adoption in supply chain management practices: a study based on the oil industry", *Journal of Innovation and Knowledge*, Vol. 6 No. 2, pp. 124-134.
- Baldea, M., Edgar, T.F., Stanley, B.L. and Kiss, A.A. (2017), "Modular manufacturing processes: status, challenges, and opportunities", *AIChE Journal*, Vol. 63 No. 10, pp. 4262-4272.
- Barrane, F.Z., Ndubisi, N.O., Kamble, S., Karuranga, G.E. and Poulin, D. (2020), "Building trust in multi-stakeholder collaborations for new product development in the digital transformation era", *Benchmarking: An International Journal*, Vol. 28 No. 1, pp. 205-228.
- Becker, T., Lier, S. and Werners, B. (2019), "Value of modular production concepts in future chemical industry production networks", *European Journal of Operational Research*, Vol. 276 No. 3, pp. 957-970.
- Beuve, J. and Saussier, S. (2012), "Interfirm cooperation in strategic relationships: the role of formal contract", *Industrial and Corporate Change*, Vol. 21 No. 4, pp. 811-836.
- Cagliano, A.C., De Marco, A. and Rafele, C. (2017), "E-grocery supply chain management enabled by mobile tools", *Business Process Management Journal*, Vol. 23 No. 1, pp. 47-70.
- Cappiello, G., Giordani, F. and Visentin, M. (2020), "Social capital and its effect on networked firm innovation and competitiveness", *Industrial Marketing Management*, Vol. 89, pp. 422-430.
- Chan, F.T. and Yee-Loong Chong, A. (2013), "Determinants of mobile supply chain management system diffusion: a structural equation analysis of manufacturing firms", *International Journal of Production Research*, Vol. 51 No. 4, pp. 1196-1213.
- Chen, J.V., Yen, D.C., Rajkumar, T.M. and Tomochko, N.A. (2011), "The antecedent factors on trust and commitment in supply chain relationships", *Computer Standards and Interfaces*, Vol. 33 No. 3, pp. 262-270.
- Daudi, M., Hauge, J.B. and Thoben, K.-D. (2016), "Behavioral factors influencing partner trust in logistics collaboration: a review", *Logistics Research*, Vol. 9 No. 1, pp. 1-11.
- Delbufalo, E. (2012), "Outcomes of inter-organizational trust in supply chain relationships: a systematic literature review and a meta-analysis of the empirical evidence", *Supply Chain Management: An International Journal*, Vol. 17 No. 4, pp. 377-402.
- Driessen, P.H. and Hillebrand, B. (2013), "Integrating multiple stakeholder issues in new product development: an exploration", *Journal of Product Innovation Management*, Vol. 30 No. 2, pp. 364-379.
- Eng, T.Y. (2006), "An investigation into the mediating role of cross-functional coordination on the linkage between organizational norms and SCM performance", *Industrial Marketing Management*, Vol. 35 No. 6, pp. 762-773.
- Fawcett, S.E., Jin, Y.H., Fawcett, A.M. and Magnan, G. (2017), "I know it when I see it: the nature of trust, trustworthiness signals, and strategic trust construction", *The International Journal of Logistics Management*, Vol. 28 No. 4, pp. 914-938.
- Fernando, Y. and Wulansari, P. (2020), "Perceived understanding of supply chain integration, communication and teamwork competency in the global manufacturing companies", *European Journal of Management and Business Economics*, Vol. 30 No. 2, pp. 191-210.

- Ford, J.K., Riley, S.J., Lauricella, T.K. and van Fossen, J.A. (2020), "Factors affecting trust among natural resources stakeholders, partners, and strategic alliance members: a meta-analytic investigation", *Frontiers in Communication*, Vol. 5 No. 9.
- Fox, S. (2015), "Moveable factories: how to enable sustainable widespread manufacturing by local people in regions without manufacturing skills and infrastructure", *Technology in Society*, Vol. 42, pp. 49-60.
- Fox, S. (2019), "Moveable production systems for sustainable development and trade: limitations, opportunities and barriers", *Sustainability*, Vol. 11 No. 19, p. 5154.
- Frydinger, D., Hart, O. and Vitasek, K. (2019), "A new approach to contracts", *Harvard Business Review*, Vol. 97 No. 5, pp. 116-126.
- Haghjoo, N., Tavakkoli-Moghaddam, R., Shahmoradi-Moghadam, H. and Rahimi, Y. (2020), "Reliable blood supply chain network design with facility disruption: a real-world application", *Engineering Applications of Artificial Intelligence*, Vol. 90, p. 103493.
- Handfield, R.B. and Bechtel, C. (2002), "The role of trust and relationship structure in improving supply chain responsiveness", *Industrial Marketing Management*, Vol. 31 No. 4, pp. 367-382.
- Hedelind, M., Jackson, M., Funk, P., Stahre, J., Söderberg, R., Carlsson, J., Björkman, M. and Winroth, M. (2007), "Factory-in-a-Box – solutions for availability and mobility of flexible production capacity", *Proceedings of Swedish Production Symposium*, Vol. 7, pp. 28-30.
- Jackson, M., Wiktorsson, M. and Bellgran, M. (2008), "Manufacturing systems and technologies for the new frontier", *Manufacturing Systems and Technologies for the New Frontier*, Springer, London, pp. 341-346.
- Kuckartz, U. and Rädiker, S. (2019), "Working with coded segments and memos", *Analyzing Qualitative Data with MAXQDA*, Springer, Cham, doi: 10.1007/978-3-030-15671-8_9.
- Kwon, I.-W.G. and Suh, T. (2004), "Factors affecting the level of trust and commitment in supply chain relationships", *The Journal of Supply Chain Management*, Vol. 40 No. 2, pp. 4-14.
- Lee, L.S. and Zhong, W. (2020), "Dependence structure, trust dimensions, and governance choices in Asian marketing channels: evidence in China", *Asian Journal of Business Research*, Vol. 10 No. 1, p. 48.
- Lohtander, M., Aholainen, A., Volotinen, J., Peltokoski, M. and Ratava, J. (2017), "Location independent manufacturing – case-based blue ocean strategy", *Procedia Manufacturing*, Vol. 11, pp. 2034-2041.
- Lui, S.S. and Ngo, H.-Y. (2004), "The role of trust and contractual safeguards on cooperation in non-equity alliances", *Journal of Management*, Vol. 30 No. 4, pp. 471-485.
- Matt, D.T., Rauch, E. and Dallasega, P. (2015), "Trends towards distributed manufacturing systems and modern forms for their design", *Procedia CIRP*, Vol. 33, pp. 185-190.
- Mirkouei, A., Mirzaie, P., Haapala, K.R., Sessions, J. and Murthy, G.S. (2016), "Reducing the cost and environmental impact of integrated fixed and mobile bio-oil refinery supply chains", *Journal of Cleaner Production*, Vol. 113, pp. 495-507.
- Morgan, R.M. and Hunt, S.D. (1994), "The commitment-trust theory of relationship marketing", *Journal of Marketing*, Vol. 58 No. 3, pp. 20-38.
- Ndubisi, N.O. (2010), "Conflict handling, trust and commitment in outsourcing relationship: a Chinese and Indian study", *Industrial Marketing Management*, Vol. 40 No. 1, pp. 109-117.
- Ndubisi, N.O., Dayan, M., Yeniaras, V. and Al-hawari, M. (2020), "The effects of complementarity of knowledge and capabilities on joint innovation capabilities and service innovation: the role of competitive intensity and demand uncertainty", *Industrial Marketing Management*, Vol. 89, pp. 196-208.
- Nematollahi, I. (2019), "Empirical investigation of trust antecedents and consequences in decentralized supply chain: the case of cosmetics market in Iran", *Decision Science Letters*, Vol. 8 No. 4, pp. 483-504.

- Nicolaou, A.I. and McKnight, D.H. (2006), "Perceived information quality in data exchanges: effects on risk, trust, and intention to use", *Information Systems Research*, Vol. 17 No. 4, pp. 332-351.
- Nyaga, G.N., Whipple, J.M. and Lynch, D.F. (2010), "Examining supply chain relationships: do buyer and supplier perspectives on collaborative relationships differ?", *Journal of Operations Management*, Vol. 28 No. 2, pp. 101-114.
- Öberg, C. (2019), "Additive manufacturing – digitally changing the global business landscape", *European Journal of Management and Business Economics*, Vol. 28 No. 2, pp. 174-188.
- Oghazi, P., Fakhrai Rad, F., Karlsson, S. and Haftor, D. (2018), "RFID and ERP systems in supply chain management", *European Journal of Management and Business Economics*, Vol. 27 No. 2, pp. 171-182.
- Olugboye, O. and Windapo, A. (2019), "Theoretical model of trust-based relationships in building information modelling supply chain for construction projects", *Acta Structilia*, Vol. 26 No. 2, pp. 107-141.
- Palaniappan, G. (2017), "Determinants of corporate financial performance relating to board characteristics of corporate governance in Indian manufacturing industry: an empirical study", *European Journal of Management and Business Economics*, Vol. 26 No. 1, pp. 67-85.
- Paluri, R.A. and Mishal, A. (2020), "Trust and commitment in supply chain management: a systematic review of literature", *Benchmarking: An International Journal*, Vol. 27 No. 10, pp. 2831-2862.
- Pan, Y., Nam, T., Ogara, S. and Lee, S. (2013), "Adoption model of mobile-enabled systems in supply chain mobile-enabled systems in supply chain", *Industrial Management and Data Systems*, Vol. 113 No. 2, pp. 263-5577.
- Pech, W. and Swicegood, P. (2013), "Trust and trustworthiness: a game theory transcontinental experiment", *International Business and Economics Research Journal (IBER)*, Vol. 12 No. 3, p. 311.
- Peltokoski, M., Volotinen, J. and Lohtander, M. (2017), "Location independent manufacturing – a software solution for supply chains", *Procedia Manufacturing*, Vol. 11, pp. 863-870.
- Pomponi, F., Fratocchi, L. and Tafuri, S.R. (2015), "Trust development and horizontal collaboration in logistics: a theory based evolutionary framework", *Supply Chain Management*, Vol. 20 No. 1, pp. 83-97.
- Rosell, J. (2004), "Assembly and task planning using Petri nets: a survey", *Proceedings of the Institution of Mechanical Engineers, Part B: Journal of Engineering Manufacture* Vol. 218 No. 8, pp. 987-994.
- Rygiuk, U. (2017), "Identification of factors related to trust formation in construction supply chains", *Procedia Engineering*, Vol. 182, pp. 627-634.
- Salam, M.A. (2017), "The mediating role of supply chain collaboration on the relationship between technology, trust and operational performance: an empirical investigation", *Benchmarking*, Vol. 24 No. 2, pp. 298-317.
- Sarkar, S., Chauhan, S. and Khare, A. (2020), "A meta-analysis of antecedents and consequences of trust in mobile commerce", *International Journal of Information Management*, Vol. 50, pp. 286-301.
- Savastano, M., Amendola, C. and D'Ascenzo, F. (2018), "How digital transformation is reshaping the manufacturing industry value chain: the new digital manufacturing ecosystem applied to a case study from the food industry", *Network, Smart and Open*, Springer, Cham, pp. 127-142.
- Shahmoradi-Moghadam, H. and Schönberger, J. (2021), "Joint optimization of production and routing master planning in mobile supply chains", *Operations Research Perspectives*, Vol. 8, p. 100187.
- F3 factory (2013), "Fast, flexible, modular production technology provides platform for future European growth", available at: <https://cordis.europa.eu/docs/results/228867/final1-f3-factory-keymessages-and-casestudy-summaries.pdf> (accessed 2 May 2021).

- Wooliscroft, B. and Ganglmair-Wooliscroft, A. (2018), "Growth, excess and opportunities", *Journal of Macromarketing*, Vol. 38 No. 4, pp. 355-363.
- Wu, G., Zhao, X. and Zuo, J. (2017), "Relationship between project's added value and the trust-conflict interaction among project teams", *Journal of Management in Engineering*, Vol. 33 No. 4, p. 4017011.
- Yang, J., Wang, J., Wong, C.W.Y. and Lai, K.-H. (2008), "Relational stability and alliance performance in supply chain", *Omega*, Vol. 36 No. 4, pp. 600-608.
- Yuan, Y., Feng, B., Lai, F. and Collins, B.J. (2018), "The role of trust, commitment, and learning orientation on logistic service effectiveness", *Journal of Business Research*, Vol. 93, pp. 37-50.
- Zafari, K., Biggemann, S. and Garry, T. (2020), "Mindful management of relationships during periods of crises: a model of trust, doubt and relational adjustments", *Industrial Marketing Management*, Vol. 88, pp. 278-286.
- Zhong, W., Su, C., Peng, J. and Yang, Z. (2017), "Trust in interorganizational relationships", *Journal of Management*, Vol. 43 No. 4, pp. 1050-1075.

Appendix 1

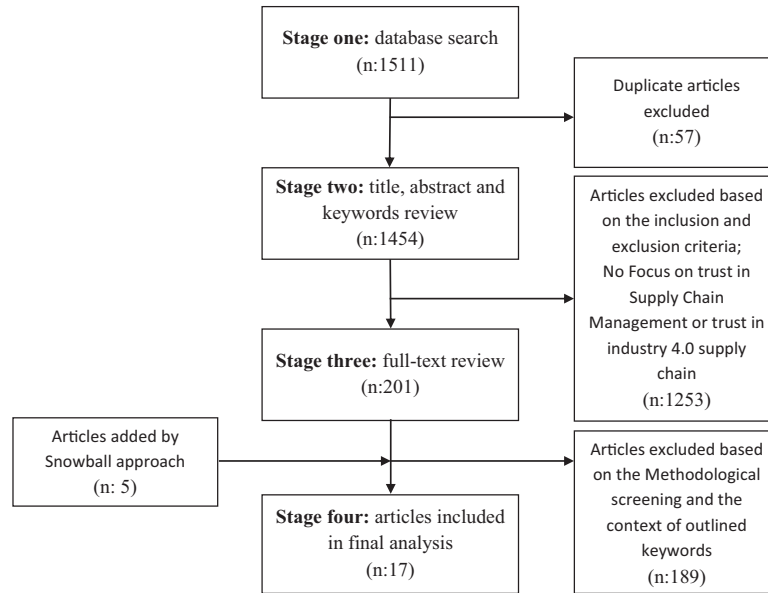
Semi-structured interview questions:

- (1) Could you please explain more about MSCs projects in your company?
- (2) We would like to know how you define trust in the concept of MSCs.
- (3) What can help you to maintain a trustworthy relationship with your stakeholders?
- (4) Do you think there would be any differences in trust between partners with this concept?
- (5) Do you think refusing to share a piece of information could affect your partner's trust level? Could it affect your informal relationship?

Appendix 2

The procedure of identifying reviewed articles

Search terms	"interorganizational trust", "inter-organizational trust", factor, anteced*, effect*, consequ*, "collaborat* supply chain", "cooperat* supply chain", multi-stakeholders, "mobile factor*", "factory-in-a-box", "location independent manufacturing", "mobile supply chain" and "Industry 4.0"
Scope of research	Science direct, ProQuest, Google Scholar and Emerald
Inclusion and exclusion criteria	<ul style="list-style-type: none"> - Considers exclusively the conceptualization of trust that involves organizations as trustor and trustee (not interpersonal trust, not intra-organizational trust, customers trusting organizations, for example, should be excluded from analyses) - Studies that investigate or evaluate either antecedents or outcomes of trust - Papers considered mathematical models, blockchain and game theories were excluded - The studies should be in the context of mentioned keywords - Only published peer-reviewed journal articles - Year 1990–2021 - Language: English
Criteria of methodological validity	Double check, verification of inclusion and exclusion criteria
Data processing	Analysis with the support of Mendeley bibliographic management, citations and references; MaxQDA, to support the coding and classification of data



Corresponding author

Nassim Ghondagsaz can be contacted at: nassim.ghondagsaz@tu-dresden.de

The current issue and full text archive of this journal is available on Emerald Insight at:
<https://www.emerald.com/insight/2444-8494.htm>

Insurers' risk management as a business process: a prospective competitive advantage or not?

Insurers' RM
as a business
process

345

Danish Ahmed

*School of Foreign Language, Shanghai Jianqiao University, Shanghai, China;
Department of Business Administration,
HANDS - Institute of Development Studies (HANDS-IDS), Karachi, Pakistan and
Center for Islamic Finance, University of Bolton, Bolton, UK*

Xie Yuantao

*School of Insurance and Economics,
University of International Business and Economics, Beijing, China, and*

Umair Saeed Bhutta

University of Technology and Applied Sciences, Ibri, Oman

Received 1 August 2021
Revised 1 September 2021
15 September 2021
Accepted 21 September 2021

Abstract

Purpose – Insurance companies exist to manage the risk of others, which is why they are perceived to be competitive in risk management (RM). Considering this, we investigate how different RM capabilities make insurers effective in RM. These capabilities include understanding risk and risk management (URRM), risk identification (RI), risk assessment and analysis (RAA) and risk monitoring (RMON) activities in insurance companies. In addition, the authors probe how these capabilities can jointly yield a competitive advantage for the insurance industry under the resource-based view (RBV) and dynamic capabilities perspective (DCP).

Design/methodology/approach – The authors present a latent variable RM model for the insurance industry and employ structural equation modeling (SEM) to test the hypotheses. Furthermore, the authors also conduct confirmatory factor analysis (CFA) and convergent and discriminant validity analysis for model fit and invariance testing, respectively.

Findings – The results show that insurers who investigated RM-related capabilities directly influence their risk management practices (RMPs). Moreover, improving these capabilities will make insurers more effective in managing the risks of others. Thus, RM as a business process will yield a competitive advantage for the insurance sector. The findings are supported by the theoretical insights presented by the RBV and DCP. Furthermore, the model also adheres to the convergent and discriminant validity cut-off values.

Originality/value – To the best of the authors' knowledge, this is the first study examining insurers' RM practices as a source of a competitive advantage.

Keywords Risk management practices, Resource-based view, Dynamic capabilities perspective, Competitive advantage, Developed and emerging markets

Paper type Research paper

© Danish Ahmed, Xie Yuantao and Umair Saeed Bhutta. Published in *European Journal of Management and Business Economics*. Published by Emerald Publishing Limited. This article is published under the Creative Commons Attribution (CC BY 4.0) licence. Anyone may reproduce, distribute, translate and create derivative works of this article (for both commercial and non-commercial purposes), subject to full attribution to the original publication and authors. The full terms of this licence may be seen at <http://creativecommons.org/licenses/by/4.0/legalcode>

This paper forms part of a special section "Innovation, Management, and Governance for Sustainable Growth", guest edited by Alba Yela.



European Journal of Management
and Business Economics
Vol. 31 No. 3, 2022
pp. 345-366
Emerald Publishing Limited
e-ISSN: 2444-8494
p-ISSN: 2444-8451
DOI 10.1108/EJMBE-08-2021-0221

Abbreviations

RM	Risk Management
URRM	Understanding Risk and Risk Management
RAA	Risk Assessment and Analysis
RMON	Risk Monitoring
RBV	Resource-based View

1. Introduction

The preceding US financial crisis of 2007–2008 wiped out \$3 trillion from the global market and mostly affected banks [1]. Insurers were the third-largest asset managers with portfolios worth \$19 trillion; however, with few exceptions (e.g. American International Group (AIG) & Yamato Life), insurers' prudent and conservative business policies proved to be resilient. However, the financial institutions that failed apparently applied sophisticated risk management (RM) techniques, but insurers' RM practices were stronger. If we examine the other side of the picture, excessive risk exposure and poorly executed or nearly nonexistent management of credit risk made the insurers AIG and Yamato Life insolvent (Pathak *et al.*, 2013) [2]. Discernibly, one can argue that effective RM determines the survival of insurance companies. Therefore, we present a model determining the antecedents of risk management practices (RMPs) in the insurance industry. Similarly, our study draws on theoretical insights from the resource-based view (RBV) and dynamic capabilities perspective (DCP) and investigates how the effectiveness of RM as a business process can yield a sustained competitive advantage for the insurance industry.

We use the RM process to assess an insurer's competitive advantage for two reasons. First, the purpose of the existence of insurance firms is to manage the risk of others. Insurance firms are perceived to be competitive in managing risks. However, insurers' business model, like other financial institutions, comprises multiple processes, such as customer services. They may have a competitive advantage in one business process and disadvantages in others. Second, the RM process, unlike others, is firm-driven whereas other processes may be market-driven. Thus, the assessment of the RM process will serve as a disaggregated measure of insurers' competitiveness.

Our model, as shown in Figure A1, shows that the RM process^[3] involves the following: (1) understanding risks and risk management (URRM), (2) risk identification (RI), (3) risk assessment and analysis (RAA), (4) RMPs and (5) risk monitoring (RMON). These components make handling those events possible and are measured by benchmarked items as recommended by various actuarial bodies, industry experts and RM laws in the USA, the UK, China and Pakistan [3]. We employ the banking sector RM model for three reasons: (1) past studies found that banks' RM practices were effective (e.g. Al-Tamimi and Al-Mazrooei, 2007; Hassan, 2009; and Hameeda and Al-Ajmi, 2012); (2) the banking sector's RM practices are fairly regulated worldwide with a more sophisticated RM regime – BASEL III – whereas insurers' RM practices are regionally controlled; and (3) to the best of our knowledge, no past study has developed an RM model for the insurance sector. However, theoretically, the link between the banking and insurance industries is inconclusive. Some researchers propose that banking and insurance services are complementary to each other (e.g. Beck and Webb, 2003). For instance, the coverage offered by insurers can hedge people from risks and thus guarantee returns for banks. Moreover, during an economic boom period, banks with improved payment systems support the rapid development of the insurance sector. In contrast, the products offered by both industries can also be substitutes (Allen and Santomero, 2001; Haiss and Stümegi, 2008), and the products offered by insurers can also capture banks' market share. This is called the "savings substitution effect". In the context of RM, we argue that stronger RM by insurers will increase their financial health, thereby promoting customer confidence. Hence, stronger RM will perform a complementary role in promoting banks' business because insurance policies are sold as bancassurance.

Modigliani and Miller (1958) argued that in perfect markets, corporate riskiness is irrelevant to firm value. Thus, RM does not yield any competitive advantage. In contrast, some researchers have suggested that RM may bring value to firms by mitigating and/or utilizing some market imperfections. The past literature has discussed the influence of RM on firm value (e.g. Liebenberg and Hoyt (2003); Hyot and Liebenberg, 2011; Leiria *et al.*, 2021) and performance (e.g. Meulbroek, 2002). However, it did not study RM from the perspective of the possible antecedent of a competitive advantage. In addition, past studies on RM and RBV have various shortcomings. First, the recent literature focusing on corporate risk modeling argues that the RM function in itself is endogenous (Ellul and Yerramilli, 2013; Smith and Stulz, 1985; Stulz, 2008) [4]. The endogeneity of the RM function could be due to two reasons. (1) The business process channel phenomenon when a firm's intrinsic risk culture (that is, a business process) determines both risk mitigation and the strength of the RM function. For instance, insurers having a conservative (aggressive) risk culture might be more (less) risk averse and might have a strengthened (weakened) RM function. Evidence for the business process channel was found in the work performed by Fahlenbrach and Stulz (2011). They found that financial entities that underperformed in the 1998 Russian crisis also performed poorly in the 2007–2008 financial turmoil. (2) The hedging channel phenomenon means that entities that are more prone to financial turmoil are mostly likely to be aggressive in handling risks (Froot *et al.*, 1993; Smith and Stulz, 1985). Hence, insurers are in the business of taking risks, and they may ideally resort to taking higher risks in tandem with stronger RM.

Second, the resource-based literature (e.g. Barney, 1986, 1991; Peteraf *et al.*, 2013; Wernerfelt, 1984; Liu *et al.*, 2019) has used a common approach of developing measures of resources/capabilities and theoretical criteria of yielding a sustained competitive advantage and enhancing firm performance. Furthermore, many of these studies (e.g. Farjoun, 1998; Markides and Williamson, 1994) have focused on tangible resources and used an aggregate measure of firm performance (Chen *et al.*, 2019). Third, few empirical studies (e.g. Al-Tamimi and Al-Mazrooei, 2007; Hassan, 2009; Hameeda and Al-Ajmi, 2012) have investigated how RMPs are influenced by different RM processes. They showed that banks' RMPs were significantly influenced by URRM, RI, RAA and RMON. Conversely, studies covering insurers' RM practices primarily focused on risk assessment and quantification processes including risk responsibilities, capital assessment, risk reporting and decision-making and employee satisfaction (e.g. Vaughan, 2009). Past empirical studies (e.g. Acharyya and Mutenga, 2013; Atluntas *et al.*, 2011; Tillinghast, 2006) only covered excerpts of insurers' RM framework, and they were not able to present a comprehensive RM model applicable in the dynamic market. Moreover, they also failed to address how the relationship between the RM process and its constituent components holds. This paper fills these potential research gaps and intends to perform the following: (1) address the potential issue of endogeneity by employing a latent variable RM model, (2) examine insurers' RM process within the context of the RBV and DCP, (3) investigate how insurers' RMPs are influenced by different RM-related capabilities and (4) investigate how RM can yield sustained competitive advantage for insurers.

Consequently, we contribute to the existing literature in the following ways. First, we contribute to the managerial finance literature by presenting a latent variable RM model. Past studies used three approaches to study insurers' RM: (1) using descriptive analysis to investigate the status of RM/ERM implementation (e.g. Altuntas *et al.*, 2011; Tillinghast, 2006), (2) constructing an RM measure to study the strength of the RM function by regressing it on some micro- and macroeconomic variables (e.g. Ellul and Yerramilli, 2013) and (3) probing how a particular financial risk (e.g. credit risk) affects a given phenomenon (e.g. agency costs) (e.g. Caballero and Krishnamurthy, 2008; Leland, 1998). We argue that RM is a broad, dynamic and complex concept that cannot be measured directly (that is, it is unobservable) but rather can be inferred through other risk-related business processes. Its strength is more likely affected by a firm's internal factors than external factors. Our model

investigates how firms' RM function (that is, RMPs) is influenced by different RM processes. Second, we contribute to the strategic management literature and investigate how insurers' RM function can yield a sustained competitive advantage under the RBV. Given the business model of the insurance industry, we assert that RM as a business process is an important source that enables insurers to realize their competitive potential. To the best of our knowledge, no study has used this approach.

The remainder of this article is structured as follows. In section 2, we discuss the theoretical background outlining the key theoretical insights of the RBV and DCP and how RM as a business process can yield a competitive advantage for the insurance sector. Section 3 discusses our model, the key variables of interest and the hypothesized relationships. Furthermore, section 4 provides details about our survey and statistical techniques employed. The empirical results and discussion are presented in section 5. Finally, section 6 concludes our article with a summary of the main findings, study limitations and future research directions.

2. Theoretical background

2.1 Risk management and the RBV

The RBV asserts that firms excel due to the resources they possess, not because of their product offerings. Ideally, firms might have access to the same pool of resources available in the market. However, one firm may be more competitive than another firm. Argumentatively, there is an intrinsic characteristic such as a "business process" that enables firms to transform these resources into valuable resources to achieve a sustained competitive advantage. The RBV argues that firms achieve and preserve competitive advantages by using worthwhile resources and capabilities that are unique (rare) (Barney, 1986, 1991; Barney and Wright, 1998; Peteraf, 2013; Wernerfelt, 1984). The theoretical expectations of the RBV suggest that not all business processes can yield a sustained competitive advantage (Ray *et al.*, 2004). The RBV literature suggests that business processes that employ common resources can provide competitive parity. Similarly, processes using valuable and unique (rare) resources can provide a temporary competitive advantage. Furthermore, business processes employing valuable, rare and expensive to copy resources will provide a preserved competitive advantage (Barney, 1991). Accordingly, business processes applying intangible resources can be sources of sustained competitive advantages (Barney, 1991; Dierickx and Cool, 1989; Itami, 1987; Lippman and Rumelt, 1982).

A "business process is a set of routine activities that organizations take to reach their objectives" (Nelson and Winter, 1982; Porter, 1979; Ray *et al.*, 2004). Contextually, resources are transformed into goods and services through business processes. Scholars admit that resources have the ability to give a competitive advantage depending on their utilization through business processes. Porter (1991, p. 108) argued that "resources are not valuable in and of themselves, but they are valuable because they allow firms to perform activities . . . business processes are the source of competitive advantage."

RM as a business process represents an intangible, socially ambiguous and path-dependent organizational resource if employed effectively and efficiently and can provide a sustainable competitive advantage to insurers. For a resource to bring a sustained competitive advantage under the RBV, it should satisfy the VRIN criteria (e.g. Barney, 1986, 1991; Peteraf, 1993; Wernerfelt, 1984; Liu *et al.*, 2019). RM is valuable (*V*) because it brings value to insurers by allowing them to exploit market imperfections through risk mitigation. All insurers in the financial market conduct RM practices. However, organizational RM procedures are specific to a particular insurer only, making them rare (*R*). Socially, the complexity characteristics of RM make it inimitable (*I*). Stronger (weaker) RM practices strengthen (weaken) the financial health of the insurer, and the effect is determined by their financial rating. Insurers' rating influences their market reputation. RM cannot be replaced by any other process, making it non-substitutable (*N*). Discernibly, insurers may not be able to attribute their performance and/or market reputation to superior RM practices, which

makes the effect causally ambiguous. RM is path-dependent and should be blended with organizational experience. The experience gained by risk managers tends to improve their competence in identifying risks, predicting their occurrence probability and effect and determining appropriate action plans.

2.2 Risk management and dynamic capabilities perspective

The RBV argues that firms gain a competitive advantage through their internal organization. Discernibly, the organizational strategy should focus on the market structure and the firm's strategic situation within that structure (Porter, 1979). Specifically, the RBV assumes that firms possess "bundles of resources" that are distributed unevenly among them. Furthermore, the difference in resources can also persist over time (Mahoney and Pandian, 1992; Wernerfelt, 1984; Bogodistov and Wohlgemuth, 2017). Argumentatively, the RBV has limitations in a dynamic environment. The DCP covers this limitation. Dynamic capabilities relate to "the capacity of an organization to purposefully create, extend, or modify its resource base" (Helfat and Peteraf, 2007). DCP focuses on firms' ability to adjust to expeditiously changing and immoderate environments (Teece *et al.*, 1997).

Dynamic capabilities are traceable routines and processes that firms need to focus on to handle unforeseen circumstances and/or changing environments (dynamic market) to achieve a sustained competitive advantage. Dynamic capabilities are distinctive and path-dependent in nature, but they are notably common among firms (equivalently termed "best practice"). Eisenhardt and Martin (2000), stated that the "DCP is more homogeneous, fungible, equifinal, and substitutable than are usually assumed". The DCP serves as a mechanism by which resources are transformed into a competitive advantage (e.g. Priem and Butler, 2000). Effective RM practices represent a dynamic capability enabling insurers to handle the uncertain and rapidly changing financial market. RM is an insurer-specific and strategic organizational process that creates value. However, RM has substantial empirical research involved with it; therefore, it has significant commonalities among top insurers. That is why most common RM practices can be referred to as insurers' best practices.

2.3 Risk management and competitive advantages

US financial turmoil and the Eurozone sovereign credit crunch revealed that the global financial market is more sophisticated and interdependent than is usually assumed. The financial market is constantly changing to satisfy borrowers' needs. Chronologically, the financial market has shifted from conventional financing modes to more complex modes. "Wall street greed" and "incentive compensation arrangement" (Harrington and Doeringhaus, 1993) made financial intermediaries devise structured financial instruments and hybrid securities, which significantly altered the financial market structure. For instance, credit default swaps (CDSs) converted AIG's insurance assets into mortgage-backed securities (MBSs) and collateralized debt obligations (CDOs) supported by real estate assets. Eventually, AIG lost \$21 billion and risked the solvency of the life insurance business and international financial market.

Metaphorically, the modern financial market can be classified as a high momentum market (e.g. Eisenhardt, 1989), where change has become nonlinear and capricious. Furthermore, when market borders are fogged, effective business models are hard to determine, and market drivers are ambiguous and continuously evolving. Similarly, uncertainty cannot be modeled in a high-velocity market as a probability because unforeseeable outcomes cannot be reasonably assessed (e.g. Eisenhardt and Martin, 2000). The very dynamic nature of the financial market has posed great challenges for RM in the insurance industry. To meet such challenges, insurers should convert the RM process (an intangible resource) into an organizational capability (e.g. read Cachón-Rodríguez *et al.*, 2019, 2020, 2021). RM should give insurers the ability to assimilate, construct and reorganize

internal and external expertise to consider rapid changes in the financial market. RM should be significantly less reliant on available knowledge and instead concentrate on expeditiously generating situation-specific advance knowledge. For instance, AIG sold CDSs to protect against the risk of default of corporate bonds. Usually, if this position is held until maturity without any externality, then this is an arbitrage trade. Similarly, in the long run, arbitrage trades are subject to market risk. Nonetheless, AIG's RM framework practically mapped both corporate bonds and CDS to the risk of default, ignoring systematic risk. We argue that effective RMPs can yield a competitive advantage for the insurance industry. In addition, insurers' RM process consists of different subprocesses/constructs, and the model that we present shows the hypothesized relationship between them (see section 3). Discernibly, an effective RM function should meet these relationships.

3. The model and hypothesis development

RM is a holistic process that examines whether other business processes within the firm are in agreement with its strategic objectives (Desender, 2007; Pagach and Warr, 2008; Nocco and Stulz, 2006; Regine and Bart, 2018). The financial sector also provides a mechanism to assess investment and performance decisions. Managers should develop an RM strategy consistent with the dynamic environment and the firm's risk appetite (Atluntas *et al.*, 2011; Moreno, *et al.*, 2021).

Efficient risk integration is the bottom line of the RM process, where interrelations among risks and risk prioritization are addressed. We argue that insurance industries such as banks and other financial institutions are exposed to similar risks, which is why we adopt the RM model previously used for the banking industry to assess the effectiveness of insurers' RMPs. Insurers have always been and will continue to be large institutional investors prone to market volatility. Furthermore, although the prior financial crisis did not affect the insurance industry much, not all insurers survived the crisis unharmed. It can be argued that large losses can still occur even if RM is flawless (Jorion, 2009). Lehman and Hoffmann (2010) stated that "the challenges emanating from the different business models and the sector-specific response of the RM practice in insurance and banking have made RM an endogenous and self-reinforcing process that over time may indeed have led to the different outcomes observed in real-time."

Nevertheless, past studies concerning insurers' RM steps (e.g. RI, RAA and RMON) slightly differ in terminologies (e.g. Carbone and Tippett, 2004; Falkner and Hiebl, 2015; Hopkins, 2015). However, they failed to find a relationship between the RM process and its components. Moreover, past empirical studies (Atluntas *et al.*, 2011; Tillinghast, 2006) only covered excerpts of the insurers' RM framework, and they were not able to present a comprehensive RM model applicable in the dynamic environment. Insurers assume indispensable risks to achieve their strategic objectives matching their "risk appetite".

Past RM studies covering the banking sector (e.g. Al-Tamimi and Al-Mazrooei, 2007; Hassan, 2009; and Hameeda and Al-Ajmi, 2012) argue that organizational RMPs are influenced by URRM, RI, RAA and RMON. The aforementioned antecedents of the RM function are latent variables. In accordance with the previous strand of literature, we measure these latent variables through Likert scale items. Our latent variable RM model will help us determine how the relationships among these variables hold, which previous RM studies focusing on insurers were unable to capture (e.g. Atluntas *et al.*, 2011; Tillinghast, 2006; and Yevgen and Veit, 2017). The details of these items are presented in Table A2. We will briefly discuss these latent variables here:

3.1 RMP

We use insurers' RMPs as the dependent variable. We measure our RMP construct with three items (i.e. RMP1, RMP2 and RMP3). Past studies have identified that for effective RM

practices, RM procedures should be well documented (RMP1) (S&P, 2005), and organizations should also encourage training programs in the area of RM and business ethics (RMP2) (AAA, 2013) [5].

3.2 URRM

RM is a path-dependent process. It is important not only to understand current scenarios but also to understand a series of historical events. In other words, insurers should not merely focus on “*who we are*” but also “*how we got here*” In the financial market, the majority of advancements in RM are influenced by past experiences. Risks may emerge through multiple sources, and these sources of risk emergence diminish with time, making the RM process path-dependent. We argue that for effective RM, insurers should have a clear understanding of past practices/experiences and imaginable future events at all levels within the organization. This can only be achieved through a clear understanding of commonly used RM terminologies (e.g. insurers' risk profile and risk appetite) at an individual level (Tiberius *et al.*, 2021). URRM is the overlapping pool of individual and collective knowledge regarding how RM tools may be used to generate and sustain competitive advantages. The common understanding of RM and organizational capabilities to handle potential risks will facilitate the achievement of risk mitigation objectives by setting a common direction at all levels.

We used three (3) items to measure our URRM construct. Similarly, we ask insurance personnel whether there is a common understanding of the organizational risk profile (URRM1), risk appetite (URRM2) and risk tolerance (URRM3) at all levels. Past studies have shown that a positive link exists between URRM and banks' RMPs (e.g. Al-Tamimi and Al-Mazrooei, 2007; Hassan, 2009; and Hassan and Al-Ajmi, 2012). Similarly, we anticipate that URRM positively influences insurers' RMPs because a good understanding of risks and RM terminologies collectively will enhance their capacity to take the right actions.

3.3 RI

RM starts with the identification of various risks emerging in the dynamic environment. RI is a dynamic capability that forms the basis of the entire RM process. Effective identification of potential internal and external risks is crucial for effective and flawless risk strategy formulation. RI involves highlighting the internal (e.g. business activity) and external (e.g. industry-specific changes) factors that might affect a firm and/or risks faced and reference values (e.g. equity capital). Insurers' incompetence in RI will render the entire RM function ineffective.

The literature suggests that an organization's RI should agree with its strategic objectives (RI1), be effective (RI2) and be comprehensive (RI3). Al-Tamimi and Al-Mazrooei (2007) and Hassan (2009) reported that banks did not face any difficulty in identifying and classifying their potential risks. They also found a positive relationship between RI and RMP. We also expect that RI will positively impact insurers' RMP because the correct identification of risks will complement the entire RM process.

3.4 RAA

RAA involves insurers' capability of evaluating the likelihood and magnitude of the risks identified and how they align with their risk strategy and long-term goals. According to the consensus reached by policy-makers, practitioners and academia, one of the reasons for the subprime risks faced by financial institutions during the 2007–2008 crisis was the flaws in risk assessment at financial institutions. Possible explanations could be the following: (1) c-suite or highly compensated market participants knowingly took excessive tail risks and were not restrained by risk managers (Senior Supervisors Group, 2008), Kashyap *et al.* (2008)

and (2) managers' risk assessment was hindered by historical measures, and they unknowingly ignored low-probability, nonsalient events that turned out to be significant (Botzen *et al.*, 2010; Shleifer, 2011; Darren and Francesco, 2018; Otero *et al.*, 2020).

We measure the RAA construct through four (4) items. Accordingly, we ask insurance personnel if their RM framework could assess risks qualitatively (RAA1) (IAA, 2008) and quantitatively (RAA2) (IAA, 2008). We also ask whether risk prioritization (RAA3) exists (EU Solvency II, 2016) and whether RAA is hindered by resource constraints (RAA4) (Al-Tamimi and Al-Mazrooei, 2007). Al-Tamimi and Al-Mazrooei (2007) and Hassan (2009) reported that banks' RMPs were positively influenced by RAA. We predict that RAA is positively linked with insurers' RMPs because insurers face resource constraints. RAA should be able to prioritize risks needing active management.

3.5 RMON

RMON involves insurers' internal control capabilities including management information systems for controlling, monitoring and reporting risks. RMON aims to determine whether the risk exposures are in line with the desired level and handled properly. We asked insurance personnel whether the responsibility (RMON1) and accountability (RMON2) (IAA, 2008) for RM are understood at all organizational levels. Past studies (e.g. Al-Tamimi and Al-Mazrooei, 2007; and Hassan, 2009; To *et al.*, 2021)) reported a positive relationship between RMON and banks' RMPs. We expect RMON to influence insurers' RMPs positively because it will assist insurers in identifying the shortcomings in the entire RM process. All of the proposed relationships among constructs are presented in appendix Figure A1.

4. The survey

4.1 The instrument description

To study the RMPs of the insurance industry, a modified version of a questionnaire previously used for banks was adopted (e.g. Al-Tamimi and Al-Mazrooei, 2007; Hassan, 2009; Hameeda and Al-Ajmi, 2012). The authors modified the questionnaire to fit the insurance sector in different regulatory regimes [6]. The questionnaire used in this study was segmented into two parts. Part 1 consisted of five nominally scaled questions related to respondent profiles such as gender, industry experience, operational position, assigned department and qualifications. It also included three questions on insurance company features: insurer type, incorporated country and majority shareholders. Part 2 included 14 ordinal scaled questions and was divided into five segments, each representing a construct to measure (i.e. URRM, RI, RAA, RMON and RMP). The ordinal questions were measured on a five-point Likert scale. The responses were measured on a continuum ranging from strongly disagree to strongly agree. The questions asked in the questionnaire were bilingual, i.e. English and Chinese.

4.2 Data and sample description

To achieve the study objectives, a self-administered survey was conducted covering both life and nonlife insurers operating in the USA, the UK, China and Pakistan. The questionnaire was distributed to insurance companies having a significant market share in their respective countries [7] and having AM best ratings greater than or equal to B-. The questionnaires were randomly distributed to respondents working in the life and nonlife sectors through the social networking platform "LinkedIn". However, in China and Pakistan, where the authors had geographical access, some of the questionnaires were distributed in print versions. The survey covered the period from October 2016 to March 2017. The research was conducted on a referral basis with informal assistance from the North American Association of Insurance

Commissioners (NAIC); the Institute and Faculty of Actuaries (UK); the Insurance Association of Pakistan (IAP); the Pakistan Society of Actuaries; Deloitte China; the University of International Business and Economics, Beijing, China and the China Association of Actuaries. Respondents who completed the questionnaire were asked to forward it to their colleagues. Respondents were provided an incentive to participate in the survey and were informed that for every successful questionnaire, one dollar would be donated to the Save the Children Inc. Syrian refugees' fund. In total 269 questionnaires were successfully filled. However, only one questionnaire from each department of an insurance company was considered, resulting in a total of 240 successfully completed questionnaires being included in this study [8]. Consequently, we were able to cover 73 insurers (i.e. 21 American, 19 British, 24 Chinese and 9 Pakistani companies) from both sectors.

The survey consisted of two phases: (1) distributing the online/print versions and collecting the completed surveys and (2) conducting a few follow-up interviews to obtain deeper insights and to find any inconsistencies among answers. According to the Swiss Re Sigma World Insurance Report 2017, the economies covered in this study contribute 44.92% of the world insurance market with respect to gross written premiums (the USA 28.9%, China 28.9%, the UK 7.03% and Pakistan 0.5%). The descriptive statistics for the sample are given in Table 1.

4.3 Statistical techniques

The answers provided by respondents were analyzed using numerous statistical methods including descriptive statistics and multivariate data analysis. However, due to the small sample size, the statistical significance possesses small power. It is worth mentioning here that even if some tests might not produce significant results, descriptive statistics indicate statistical significance. These tests cannot be interpreted as discrepancies do not exist (see appendix Table A4). In short, considering our sample size, these differences are not adequately large to be claimed "significant" with a minute probability of error.

Because the study was survey-based, confirmatory factor analysis (CFA) and structural equation modeling (SEM) were conducted as proposed by Kline (2011). CFA provided the ability to estimate the reliability and validity of the operational model, that is, how well the data fit the measurement model. SEM analysis allowed the authors to assess the goodness-of-fit of the CFA solution (Cachón-Rodríguez *et al.*, 2019, 2021). Cronbach's alpha and the average variance extracted (AVE) were calculated to assess convergent validity. Because the study was based on a multigroup survey, configural and metric invariance testing were conducted to test for measurement invariance of the questionnaire.

5. Results and discussion

5.1 Convergent and discriminant validity

We analyzed the constructs using two methods as recommended by Anderson and Gerbing (1988). First, we analyzed the five constructs represented by sixteen items using CFA. CFA is conducted to confirm the factor structures on the suggested scales. CFA was performed after removing the outliers from the dataset, as proposed by Kline (2011). Because the subsamples (i.e. the USA, the UK, China and Pakistan) were relatively small, the responses from all the countries were analyzed together. Past studies by MacCallum *et al.* (1999) and Jackson *et al.* (2001) showed that sample sizes below 100 tend to be nonconvergent.

As shown in Table 2, CFA showed that the proposed measurement model had a relatively good fit ($\chi^2 = 111.384$, $DF = 62$, normed $\chi^2 = 1.797$, $RMSEA = 0.058$, $CFI = 0.974$, $IFI = 0.974$ and $TLI = 0.961$). Thus, it can be refuted that the constructs were correctly measured by the observed variable and that their measurement power was adequate. The internal consistency assessment (Cronbach's alpha) of the constructs showed that the constituent items in the

Features	Frequency	Percentage distribution (%)
<i>Gender</i>		
Male	162	67.5
Female	78	32.5
<i>Experience</i>		
5 years or less	125	52.1
More than 5 years but less than 10 years	50	20.8
More than 10 years	65	27.1
<i>Position</i>		
Executive/director level	30	12.5
Middle management level	65	27.1
Supervisory level	29	12.1
Operational level	116	48.3
<i>Department</i>		
Operation	61	25.4
Finance	25	10.4
Actuary/risk management	78	32.5
Treasury/investment	14	5.8
Others	43	17.9
<i>Highest degree</i>		
Graduate	76	37.1
Masters	99	41.2
Doctorate	11	4.6
Professional	54	22.5
<i>Type</i>		
Life	111	46.3
Nonlife	129	53.8
<i>Incorporated country</i>		
USA	28	11.7
UK	31	12.9
China	112	46.7
Pakistan	69	28.8
<i>Majority ownership</i>		
State-owned	71	29.6
Publicly owned	151	54.6
Foreign-owned	38	15.8

Table 1.
Sample features

proposed model were reliable. The Cronbach's alpha assessment fell between the ranges of 0.711 and 0.903, and this was far above of the minimally acceptable range of 0.6 recommended by Hair *et al.* (1988). The convergent validity of the measurement model was tested using the standardized factor loadings of the items. The loadings ranged from 0.679 to 0.888 at $\alpha < 0.001$ and exceeded the 0.5 level. Moreover, convergent validity was also confirmed through the composite reliability assessment, and the constructs' reliability was acceptable and fell between 0.749 and 0.883 (Hair *et al.*, 1988). The AVE of all five constructs also exceeded the minimum level of 0.5, as proposed by Hair *et al.* (1988) and they fell between 0.562 and 0.722, giving strong evidence of convergent validity (Conway and Lance, 2010; Siemsen *et al.*, 2010). To test the discriminant validity among constructs, we needed to determine whether the correlations among constructs were significantly different from zero. The correlation confidence interval $correlations \pm -1.96 \times standard\ error\ of\ estimate$ did not

Variables	Standardized loadings	Cronbach's alpha	Construct reliability (CR)	AVE	MSV	Max R (H)
<i>URRM</i>		0.829	0.853	0.659	0.578	0.854
URRM1	0.839***					
URRM2	0.791***					
URRM3	0.813***					
<i>RI</i>		0.881	0.883	0.716	0.585	0.886
RI1	0.859***					
RI2	0.870***					
RI3	0.808***					
<i>RAA</i>		0.785	0.836	0.562	0.523	0.853
RAA1	0.739***					
RAA2	0.715***					
RAA3	0.855***					
RAA4	0.679***					
<i>RMON</i>		0.837	0.838	0.722	0.585	0.849
RMON1	0.888***					
RMON2	0.801***					
<i>RMP</i>		0.747	0.749	0.600	0.521	0.757
RMP1	0.813***					
RMP2	0.734***					

Note(s): Goodness-of-fit index: $\chi^2 = 111.384$, DF = 62, normed $\chi^2 = 1.797$, RMSEA = 0.058, CFI = 0.974, IFI = 0.974 and TLI = 0.961

*** ρ -value < 0.001

** ρ -value < 0.01

* ρ -value < 0.05

Table 2.
Confirmatory factor
analysis
results ($N = 240$)

possess 1 (Joeng and Jang, 2011). We also checked the maximum shared variance (MSV) and max R (H), which were also acceptable. Conclusively, CFA showed that the measurement model possessed both convergent and discriminant validity. For brevity, the items are indicated by abbreviations. The full forms are presented in appendix Table A2, and the correlation matrix of the constructs is presented in appendix Table A3. In the analysis available upon request, we show that none of the items were significantly correlated with each other.

Measurement invariance testing was conducted to assess how the constructs were supported by multiple groups (Kline, 2011). Due to very small country-wise subsamples, invariance testing was conducted by establishing two insurer subgroups: life and nonlife. Fan *et al.* (1999) studied the influence of the sample size on SEM and found that most of the model fit indices, such as the GFI, AGFI, RFI and NNFI, were affected by the sample size. Although the invariance testing results were largely influenced by a relatively small subsample size, overall, both configural invariance and metric invariance test results showed that in both groups, the constructs were represented in the same way. The invariance testing results are presented in Table 3.

5.2 SEM model

SEM analysis was conducted to assess the general model fit and relationships among constructs (as represented in Figure A1). The results of the SEM analysis are presented in Table 2, and the conceptual model is presented in appendix Figure A2. All of the goodness-of-fit indices fell between acceptable ranges, demonstrating that the structural model fit the data well. However, the significance of the chi-squared value (i.e. ρ -value < 0.001) indicates that the estimated covariance matrix diverts significantly from the sample covariance matrix, and

Configural invariance	Cut-off value	Metric invariance	Cut-off value
$\chi^2 = 181.331$		$\chi^2 = 201.516$	
DF = 124		DF = 138	
ρ -value < 0.001		ρ -value < 0.001	
Normed $\chi^2 = 1.462$	1.0–3.0	Normed $\chi^2 = 1.460$	1.0–3.0
RMSEA = 0.046	<0.08	RMSEA = 0.046	<0.08
CFI = 0.901	>0.90	CFI = 0.967	>0.90
IFI = 0.971	>0.90	IFI = 0.967	>0.90
TLI = 0.956	>0.90	TLI = 0.956	>0.90

Table 3.
Invariance testing
results

Note(s): The chi-squared difference test was conducted with the null hypothesis that the: the two groups have metric invariance to test for metric invariance. The reported ρ -value = 0.131 resulting in accepting the null hypothesis

this divergence can be attributed to sampling size issues (Fan *et al.*, 1999). To overcome this chi-squared shortcoming, the normed chi-squared was calculated, and it fell in an acceptable range of 1.0–3.0. The other indices, such as the comparative fit index (CFI), incremental fit index (IFI) and Tucker–Lewis index (TLI), significantly exceeded the cut-off value of 0.90; in contrast, the goodness-of-fit index (GFI) was relatively lower. In addition, the root mean square residual (RMR) and root mean square error of approximation (RMSEA) also fell between acceptable ranges, further confirming that the structural model fit the data well.

5.3 Discussion

Our findings show that comprehensive RI, improved RMON and extensive RAA by insurers will improve the effectiveness of RM function. In addition, our results also indicate that an increase in the URRM will also improve insurers' RM function, but the relationship is statistically nonsignificant (see Table 4). Our results are consistent with the findings of Al-Tamimi and Al-Mazrooei (2007), Hassan (2009) and Hameeda and Al-Ajmi (2012). They found that banks' RMP function was positively influenced by URRM, RI, RMON and RAA for

Variable relationships	Standardized estimate	<i>t</i> -statistic	ρ -value	Significance
RMP → RI	0.209	1.875	0.061	*
RMP → RMON	0.345	2.800	0.005	***
RMP → RAA	0.223	2.357	0.018	**
RMP → URRM	0.119	1.188	0.235	

Model fit indices	Cut-off value
$\chi^2 = 106.956$	
DF = 62	
ρ -value < 0.001	
Normed $\chi^2 = 1.725$	1.0–3.0
RMSEA = 0.057	<0.08
CFI = 0.977	>0.90
IFI = 0.977	>0.90
TLI = 0.966	>0.90

Table 4.
Structure equation
modeling results

Note(s): *** ρ -value < 0.01
** ρ -value < 0.05
* ρ -value < 0.1

banks operating in the Middle East region. Our results agree with RBV's expectation that intangible and socially complex resources such as URRM, RI, RMON and RAA will enhance the effectiveness of the business processes within an organization (e.g. RM). RM is a socially complex and path-dependent phenomenon; hence, insurers should have a sound understanding of the common risks and RM terminologies. This will enable insurers to purposefully create and modify their RM framework to fit the dynamic environment. URRM and RI are specialized skills (or resources) that enable management to formulate an effective organizational risk strategy consistent with their strategic goals. Furthermore, RMON and RAA are recursive business processes that enable firms to examine the effectiveness of their RM function in achieving their strategic goals. The positive relationships between RMP and URRM, RI, RAA and RMON show that insurers' RM function is effective. This supports the DCP in that effective RM can also enhance insurers' competitiveness. The goal of insurers is to bear the risk of others; and improved URRM, RI, RAA and RMON will enable them to meet their strategic goal of minimizing risks effectively. Thus, they will perform competitively.

Our results show that insurers' RMPs are positively influenced by URRM, but the relationship is nonsignificant (see Table 4). This finding is quite puzzling because studies conducted by practitioners (e.g. AAA, 2013; S&P, 2005) recommended that there should be a common understanding of the various risks and RM terminologies at all organizational levels in the insurance industry; hence, strengthening URRM will also enhance insurers' RM framework. From practitioners' perspective, enhanced knowledge of URRM will enable insurers' personnel to better understand their perceived contribution towards organizational RM objectives. In addition, our results also show that insurers' RMPs were positively and significantly influenced by RI. Our finding related to RI is propitious for the insurance sector and is also consistent with the previous strand of literature (e.g. Al-Tamimi and Al-Mazrooei, 2007; Hassan, 2009; and Hameeda and Al-Ajmi, 2012). Comprehensive RI will correctly recognize relevant risks; hence, stronger RI will complement insurers' RM. Similarly, correct identification of the relevant risks will assist in designing appropriate RM measures. Furthermore, we also found that RAA positively and significantly influences insurers' RMPs. This promising finding is consistent with previous studies (e.g. Al-Tamimi and Al-Mazrooei, 2007; Hassan, 2009; and Hameeda and Al-Ajmi, 2012) that banks' RMPs were positively and significantly influenced by RAA. From practitioners' perspective, improving insurers' ability to assess and analyze risks will enable them to correctly match their risk-taking with their risk tolerance. Finally, our results show that insurers' RMPs are also positively and significantly influenced by RMONs. This finding is also consistent with the previous strand of literature. For instance, Hameeda and Al-Ajmi (2012) found that banks' RMPs were positively influenced by RMON. From practitioners' perspective, improved RMON will enable insurers to determine whether the risk exposures are in line with the desired level and addressed properly. It will also give insurers the ability to take corrective measures where necessary.

6. Conclusion

In this study, we investigated how insurers' RMPs can yield a sustained competitive advantage for the insurance industry. We did this by studying the relationship between insurers' RMPs and different RM-related capabilities/processes, namely, URRM, RI, RAA and RMON. Similarly, we found that insurers' RMPs were significantly influenced by RI, RAA and RMON. Our findings agreed with the expectations of the RBV and DCP. However, URRM did not have any influence on insurers' RMPs. We argued that insurers' RM framework, as a business process, is an intangible resource that satisfies VRIN criteria (see section 2 for the details). However, insurers' RM-related practices are significantly common in the industry and are often termed best practices. We further contend that an effective RM framework will

enhance insurers' capability to purposefully create and modify their resource base to fit a high momentum financial market.

The significance of our study is supported by its unique purpose. We found that different RM-related capabilities of interest played significant roles in determining the effectiveness of insurers' RMPs. Our findings entail several practical and policy implications. These findings can generally be applied not only to the insurance industry but also to other financial institutions. For instance, from a regulatory perspective, our research findings will assist regulators in setting priority-based regulatory guidelines. Moreover, from a practitioner's perspective, our findings can be used by insurers to introduce RM-related training and development programs to rectify the shortcomings identified by this study.

The few limitations of this study are that the questions asked in this were closed-ended, respondents were required to choose among available options and they were not encouraged to provide their feedback. Second, our second limitation is the use of a 5-point Likert scale (e.g. strongly disagree to strongly agree) to measure respondents' opinions. Respondents were encouraged to select their opinion from available alternatives without providing a suitable rationale. However, the appropriate rationale could highlight the magnitude of the huge difference between the opinions.

Considering the study findings and limitations, as well as the scarce literature on insurers' RM practices, future research directions abound. The possible future directions could be secondary data analysis covering the past trends and financial shocks of the developed and emerging insurance markets to arrive at more objective findings.

Endnotes

- (1) The model we have adopted has been used to assess banking sector RMPs. See Al-Tamimi and Al-Mazrooei (2007), Hassan (2009) and Hameeda and Al-Ajmi (2012) for further details.
- (2) First, the authors incorporated the insurance literature into the questionnaire then, the questionnaire was sent to the industry experts such as CEOs, CFO's, Directors and CRO's of all the economies. They were asked to comment on the questionnaire based on their feedback the modifications were made, and the questionnaire was sent again, this process was repeated until the final draft. Afterward, a pilot study with a sample size of 100 was conducted. During the pilot study, a questionnaire was further amended based on respondents' feedback and CFA analysis. The details of the questionnaire modifications are presented in Appendix Table A1.
- (3) The numerous definitions of the RM process exist in the literature. This definition is the most comprehensive one. See Bogodistov and Wohlgemuth (2017) for details.

Acknowledgment

The authors are very grateful to numerous people for assisting in the research by providing their valuable feedback on questionnaire adaptation and referring to insurance personnel. The authors would like to express their gratitude to the following people: Mr. Andrew Hitchcox, group chief risk officer, Tokio Marine Kiln Group Ltd. UK.

Mr. Colin Thores, Education Actuary, Institute and Faculty of Actuaries UK.

Mr. Nadeem Malik, Deputy Chief Executive, IGI Life Insurance, Pakistan.

Mr. Liu Hao-Yu, director, risk management department, Deloitte, China.

Mr. Shan Rabbani, Head of Retail and Actuarial Services, Jubilee Life Insurance Ltd. Pakistan for helping in questionnaire adaptation.

Mr. Tahir Ahmed, Ex-Managing Director and Chief Executive, Jubilee General Insurance Ltd. Pakistan.

Mr. Tahir Masud, Chief Executive, IGI Insurance, Pakistan.

Professor Zeng Lixin, School of Insurance and Economics, University of International Business and Economics, China.

Notes

1. International monetary fund (2009).
2. AIG suffered losses of \$99.2 billion in 2008. Furthermore, Japanese time-honored insurer Yamato Life failed with \$2.7 billion in debts.
3. We adopted the questionnaire previously used to assess the effectiveness of the risk management practices of the banking sector (e.g. Hameeda and Al-Ajmi, 2012). In addition, for each variable of interest, we incorporated recommendations made by local actuarial bodies and regulatory frameworks of the sample region (see Appendix A1 & A2 for details). We treated these recommendations as benchmark RM practices. Moreover, we sent the final draft of the questionnaire to the key personnel (e.g. CEO, CRO, etc.) of the insurance sector of the sample region and asked for their feedback (see the Acknowledgment section for the details). Then, the questionnaire was resent to the same experts after including recommended amendments. This process was repeated until a consensus was reached.
4. An endogenous phenomenon is one that evolves within a particular system rather than outside that system.
5. For the details of the items, please refer to appendix Tables A1 and A2.
6. First, the authors incorporated the insurance literature into the questionnaire. Then, the questionnaire was sent to industry experts such as the CEOs, CFOs, directors and CROs of insurance companies operating in China, Pakistan, the UK and the USA. These experts were asked to comment on the questionnaire. Based on their feedback, modifications were made, and the questionnaire was resent again. This process was repeated until the final draft was acquired. Then, a pilot study with a sample size of 100 was conducted. During the pilot study, the questionnaire was further amended based on respondents' feedback and CFA. The details of the questionnaire modifications are presented in Appendix Table A1.
7. We calculated the market share as the sum of the direct premiums written across all product lines by a particular insurer divided by the sum of direct premiums written in fire, allied, commercial multiple perils and homeowners' lines by all insurers nationwide.
8. The reason for this is that during the survey, we noticed that similar responses were collected from the same department. However, when the responses were different, both of the filled questionnaires were considered.

References

- Acharyya, M. and Mutenga, S. (2013), "The benefits of implementing enterprise risk management: evidence from the non-life insurance industry", *paper presented at the 2013 Enterprise Risk Management Symposium April 22-24, 2013*, Chicago.
- Al-Tamimi, H.A.H. and Al-Mazrooei, F.M. (2007), "Banks' risk management: a comparison study of UAE national and foreign banks", *The Journal of Risk Finance*, Vol. 8 No. 4, pp. 394-409.
- Allen, F. and Santomero, A.M. (2001), "What do financial intermediaries do?", *Journal of Banking and Finance*, Vol. 25, pp. 271-294, doi: 10.1016/S0378-4266(99)00129-6.
- American Academy of Actuaries (AAA) (2013), "A public policy practice note: insurance enterprise risk management practices" (March), American Academy of Actuaries.
- Anderson, J.C. and Gerbing, D.W. (1988), "Structural equation modeling in practice: a review and recommended two steps approach", *Psychological Bulletin*, Vol. 103 No. 3, pp. 411-423.

- Atluntas, M., Thomas, B.S.R. and Robert, H.E. (2011), "Implementation of enterprise risk management: evidence from the German property-liability insurance industry", *The Geneva Papers on Risk and Insurance—Issues and Practice*, Vol. 36 No. 03, pp. 414-439.
- Barney, J.B. (1986), "Strategic factor markets: expectation, luck, and business strategy", *Management Science*, Vol. 32 No. 10, pp. 1231-1241.
- Barney, J. (1991), "Firm resources and sustained competitive advantage", *Journal of Management*, Vol. 17 No. 1, pp. 99-120.
- Barney, J.B. and Wright, P.M. (1998), "On becoming a strategic partner: the role of human resource in gaining competitive advantage", *Human Resource Management*, Vol. 37 No. 1, pp. 31-46.
- Beck, T. and Webb, I. (2003), "Economic, demographic, and institutional determinants of life insurance consumption across countries", *The World Bank Economic Review*, Vol. 17 No. 1, pp. 51-88.
- Bogodistov, Y. and Wohlgemuth, V. (2017), "Enterprise risk management: a capability-based perspective", *Journal of Risk Finance*, Vol. 18 No. 3, pp. 234-251.
- Botzen, W.J.W., Van den Bergh, J.C.J.M. and Bouwer, L.M. (2010), "Climate change and increased risk for the insurance sector: a global perspective and an assessment for The Netherlands", *Natural Hazards*, Vol. 52 No. 3, pp. 577-598.
- Caballero, R.J. and Krishnamurthy, A. (2008), "Collective risk management in a flight to quality episode", *Journal of Finance*, Vol. 63 No. 5, pp. 2195-2230.
- Cachón-Rodríguez, G., Prado-Román, C. and Zúñiga-Vicente, J.Á. (2019), "The relationship between identification and loyalty in a public university: are there differences between (the perceptions) professors and graduates?", *European Research on Management and Business Economics*, Vol. 25 No. 3, pp. 122-128, doi: 10.1016/j.iedeen.2019.04.005.
- Cachón-Rodríguez, G., Prado-Román, C. and Blanco-González, A. (2020), "The relationship between corporate identity and university loyalty: the moderating effect of brand identification in managing an institutional crisis", *Journal of Contingencies and Crisis Management*. doi: 10.1111/1468-5973.12342.
- Cachón-Rodríguez, G., Blanco-González, A., Prado-Román, C. and Diez-Martin, F. (2021), "Sustainability actions, employee loyalty, and the awareness: the mediating effect of organization legitimacy", *Managerial and Decision Economics*, Vol. 42 No. 7, pp. 1730-1739, doi: 10.1002/mde.3340.
- Carbone, T.A. and Tippett, D.D. (2004), "Project risk management using project risk FMEA", *Engineering Management Journal*, Vol. 16 No. 4, pp. 28-35.
- Chen, Y.L., Chuang, Y.W., Huang, H.G. and Shih, J.Y. (2019), "The value of implementing enterprise risk management: evidence from Taiwan's financial industry", *North American Journal of Economics and Finance*. doi: 10.1016/j.najef.2019.02.004.
- Conway, J.M. and Lance, C.E. (2010), "What reviewers should expect from authors regarding common method bias in organizational research", *Journal of Business and Psychology*, Vol. 25 No. 3, pp. 325-334.
- Darren, R.H. and Francesco, C. (2018), "Open-source intelligence for risk assessment", *Business Horizons*, Vol. 61 No. 5, pp. 689-697.
- Desender, K. (2007), *On the Determinants of Enterprise Risk Management Implementation*, Working Paper, Autonomous University of Barcelona, 2007.
- Dierickx, I. and Cool, K. (1989), "Asset stock accumulation and sustainability of competitive advantage", *Management Science*, Vol. 35 No. 12, pp. 1504-1513.
- Eisendhardt, M.K. (1989), "Building theories from case study research", *Academy of Management Review*, Vol. 14 No. 4, pp. 532-550.
- Eisendhardt, M.K. and Martin, A.J. (2000), "Dynamic capabilities: what are they?", *Strategic Management Journal*, Vol. 21 Nos 10-11, pp. 1105-1121.

- Ellul, A. and Yerramilli, V. (2013), "Stronger risk controls, lower risk: evidence from U.S. Bank holding companies", *Journal of Finance*, Vol. 68 No. 5, pp. 1757-1803.
- Fahlenbrach, R. and Stulz, R. (2011), "Bank CEO incentives and the credit crisis", *Journal of Financial Economics*, Vol. 99, pp. 11-26.
- Falkner, E.M. and Hiebl, M.R.W. (2015), "Risk management in SMEs: a systematic review of available evidence", *The Journal of Risk Finance*, Vol. 16, pp. 122-144.
- Fan, X., Thompson, B. and Wang, L. (1999), "Effects of sample size, estimation methods, and model specification on structural equation modeling fit indexes", *Structural Equation Modeling: A Multidisciplinary Journal*, Vol. 6 No. 1, pp. 56-83.
- Farjoun, M. (1998), "The independent and joint effect of the skill and physical bases of relatedness in diversification", *Strategic Management Journal*, Vol. 19 No. 7, pp. 611-630.
- Froot, K.A., Scharfstein, D.S. and Stein, J.C. (1993), "Risk management: coordinating corporate investment and financing policies", *The Journal of Finance*, Vol. 48 No. 5, pp. 1629-1658.
- Hair, J.F., Anderson, R.E., Thatham, R.L. and Black, W.C. (1988), *Multivariate Data Analysis*, 5th ed., Prentice Hall, Upper Saddle River, NJ.
- Haiss, P.R. and Sümegi, K. (2008), "The relationship of insurance and economic growth - a theoretical and empirical analysis (january 3, 2007)", *Emprica, Journal of Applied Economics and Economic Policy*, Vol. 35 No. 4, pp. 405-431, available at: <https://ssrn.com/abstract=968243>.
- Hameeda, A.H. and Al-Ajmi, J. (2012), "Risk management practices of conventional and Islamic banks in Bahrain", *The Journal of Risk Finance*, Vol. 13 No. 3, pp. 215-239.
- Harrington, S.E. and Doeringhaus, H.I. (1993), "The economics and politics of automobile insurance rate classification", *The Journal of Risk and Insurance*, Vol. 60 No. 1, pp. 59-84.
- Hassan, A. (2009), "Risk management practices of Islamic banks of Brunei Darussalam", *The Journal of Risk Finance*, Vol. 10 No. 1, pp. 23-37.
- Helfat, E.C. and Peteraf, A.M. (2007), "Understanding dynamic capabilities: progress along a developmental path", Vol. 7 No. 1, pp. 91-102.
- Hopkin, P. (2015), *Fundamentals of Risk Management: Understanding, Evaluating and Implementing Effective Risk Management*, 3rd ed., Kogan Page, London.
- Hoyt, R.E. and Liebenberg, A.F. (2011), "The value of enterprise risk management", *The Journal of Risk and Insurance*, Vol. 78 No. 4, pp. 795-1042.
- International Actuarial Association (IAA) (2008), "Practice note on enterprise risk management for capital and solvency purposes in the insurance industry", (August), International Actuarial Association.
- Itami, H. (1987), *Mobilizing Invisible Assets*, Harvard University Press, Cambridge, MA.
- Jackson, D.L. (2001), "Sample size and number of parameter estimates in maximum likelihood confirmatory factor analysis: a monte carlo investigation", *Structural Equation Modeling: A Multidisciplinary Journal*, Vol. 8 No. 2, pp. 205-222.
- Jeong, E.H. and Jang (Shawn), S.C. (2011), "Restaurant experiences triggering positive electronic word of mouth (eWOM) motivations", *International Journal of Hospitality Management*, Vol. 30 No. 2, pp. 356-366.
- Jorion, P. (2009), "Risk management lessons from the credit crisis", *European Financial Management, European Financial Management Association*, Vol. 15 No. 5, pp. 923-933.
- Kashyap, A.K., Rajan, R.G. and Jeremy, C.S. (2008), *Rethinking Capital Regulation, Federal Reserve Bank of Kansas City Symposium on Maintaining Stability in a Changing Financial System*, Jackson Hole, Wyoming, available at: <http://www.kc.frb.org/publicat/sympos/2008/KashyapRajanStein.08.08.08.pdf>.
- Kline, B.R. (2011), *Principles and Practice of Structural Equation Modeling*, 3rd ed., The Guilford Press, New York.

- Lehmann, A.P. and Hofmann, D.M. (2010), "Lessons learned from the financial crisis for risk management: contrasting developments in insurance and banking", *The Geneva Papers on Risk and Insurance. Issues and Practice*, Vol. 35 No. 1, pp. 63-78.
- Leiria, M., Rebelo, E. and deMatos, N. (2021), "Measuring the effectiveness of intermediary loyalty programmes in the motor insurance industry: loyal versus non-loyal customers", *European Journal of Management and Business Economics*, Vols ahead-of-print Nos ahead-of-print, doi: 10.1108/EJMBE-05-2020-0103.
- Leland, E.H. (1998), "Agency costs, risk management, and capital structure", *Journal of Finance*, Vol. 53 No. 4, pp. 1213-1243.
- Liebenberg, A.P. and Hoyt, R.E. (2003), "Determinants of enterprise risk management: evidence from the appointment of chief risk officers", *Risk Management and Insurance Review*, Vol. 6 No. 1, pp. 37-52.
- Lippman, S. and Rumelt, R. (1982), "Uncertain imitability: an analysis of interfirm differences in efficiency under competition", *Bell Journal of Economics*, Vol. 13, pp. 418-438.
- Liu, H.H., Chang, A. and Shiu, Y.M. (2019), "Interest rate derivatives and risk exposure: evidence from life insurance industry", *North American Journal of Finance and Economics*. doi: 10.1016/j.najef.2019.04.021.
- MacCallum, R.C., Widaman, K.F., Zhang, S. and Hong, S. (1999), "Sample size in factor analysis", *Psychological Methods*, Vol. 4, pp. 44-99.
- Mahoney, J.T. and Pandian, J.R. (1992), "The resource-based view within the conversation of strategic management", *Strategic Management Journal*, Vol. 13, pp. 363-380, doi: 10.1002/smj.4250130505.
- Markides, C.C. and Williamson, P.J. (1994), "Related diversification, core competencies, and corporate performance", *Strategic Management Journal, Summer Special Issue*, Vol. 15, pp. 149-165.
- Meulbroek, L. (2002), "The promise and challenge of integrated risk management", *Risk Management and Insurance Review, American Risk and Insurance Association*, Vol. 5 No. 1, pp. 55-66, September.
- Modigliani, F. and Miller, M. (1958), "The cost of capital, corporation finance and the theory of investment", *American Economic Review*, Vol. 48 No. 3, pp. 261-297.
- Moreno, I., Parrado-Martínez, P. and Trujillo-Ponce, A. (2021), "Using the Z-score to analyze the financial soundness of insurance firms", *European Journal of Management and Business Economics*, Vol. ahead-of-print No. ahead-of-print, doi: 10.1108/EJMBE-09-2020-0261.
- Nelson, R.R. and Winter, S.G. (1982), *An Evolutionary Theory of Economic Change*, Harvard University Press, Cambridge, MA.
- Nocco, B.W. and Stulz, R.M. (2006), "Enterprise risk management: theory and practice", *Journal of Applied Corporate Finance*, Vol. 18 No. 4, pp. 8-20.
- Otero, L., Alaraj, R. and Lado-Sestayo, R. (2020), "How corporate governance and ownership affect banks' risk-taking in the MENA countries?", *European Journal of Management and Business Economics*, Vol. 29 No. 2, pp. 182-198, doi: 10.1108/EJMBE-01-2019-0010.
- Pagach, D. and Warr, R. (2008), *The Effects of Enterprise Risk Management on Firm Performance*, Working Paper, North Carolina State University.
- Pathak, V., Jena, B. and Kalra, S. (2013), "Qualitative research", *Perspectives in Clinical Research*, Vol. 4, p. 192.
- Peteraf, M. (1993), "The cornerstones of competitive advantage: a resource-based view", *Strategic Management Journal*, Vol. 14, pp. 179-191, doi: 10.1002/smj.4250140303.
- Peteraf, M., Di Stefano, G. and Verona, G. (2013), "The elephant in the room of dynamic capabilities: bringing two diverging conversations together", *Strategic Management Journal*, Vol. 34 No. 12, pp. 1389-1410.

- Porter, M.E. (1991), "Towards a dynamic theory of strategy", *Strategic Management Journal*, Vol. 12 No. 1, pp. 95-117.
- Porter, M.E. (1979), "How competitive forces shape strategy", *Harvard Business Review*, Vol. 57, pp. 137-145.
- Priem, R.L. and Butler, E.J. (2000), "Is the resource-based 'view' a useful perspective for strategic management research?", *The Academy of Management Review*, Vol. 26 No. 1, pp. 22-40.
- Ray, G., Barney, J.B. and Muhanna, A.W. (2004), "Capabilities, business processes, and competitive advantage: choosing the dependent variable in empirical tests of the resource-based view", *Strategic Management Journal*, Vol. 25, pp. 23-37.
- Regine, S. and Bart, D. (2018), "Transforming under deep uncertainty: a strategic perspective on risk management", *Business Horizons*, Vol. 61 No. 5, pp. 733-743.
- Senior Supervisors Group (2008), "Observation of risk management practices during the recent market turbulence".
- Shleifer, A. (2011), *The transformation of finance, Lecture at American Finance Association Meetings*, available at: [http://scholar.harvard.edu/files/shleifer/files/transformation of finance_afa_jan2011.pdf](http://scholar.harvard.edu/files/shleifer/files/transformation_of_finance_afa_jan2011.pdf).
- Siemsen, E., Roth, A. and Oliveira, P. (2010), "Common method bias in regression models with linear, quadratic, and interaction effects", *Organizational Research Methods*, Vol. 13 No. 3, pp. 456-476.
- Smith, C.W. and Stulz, R. (1985), "The determinants of firms' hedging policies", *Journal of Financial and Quantitative Analysis*, Vol. 28, pp. 391-405.
- Standard and Poor's (S&P) (2005), "Evaluating the enterprise risk management practices of insurance companies", (October), Standard and Poor's, pp. 1-47.
- Stulz, R. (2008), "Risk management failures: what are they and when do they happen?", *Journal of Applied Corporate Finance*, Vol. 20, pp. 58-67.
- Teece, J.D., Pisano, G. and Shuen, A. (1997), "Dynamic capabilities and strategic management", *Strategic Management Journal*, Vol. 18 No. 7, pp. 509-533.
- Tiberius, V., Schwarzer, H. and Roig-Dobón, S. (2021), "Radical innovations: between established knowledge and future research opportunities", *Journal of Innovation and Knowledge*, Vol. 6 No. 3, pp. 145-153, doi: 10.1016/j.jik.2020.09.001.
- Tillinghast (2006), "Risk management", *Risk Opportunity, The 2006 Tillinghast ERM Survey*, Tillinghast.
- To, T.A., Suzuki, Y., Ho, H.T.T., Tran, S.T. and Tran, T.Q. (2021), "The risk management role of nonexecutive directors: from capital expenditure perspective", *European Journal of Management and Business Economics*, Vol. 30 No. 2, pp. 152-169, doi: 10.1108/EJMBE-12-2019-0237.
- Vaughan, M.T. (2009), "The economic crisis and lessons from (and for) US regulation", *Journal of Insurance Regulation*, Vol. 2015, pp. 1-18.
- Wernerfelt, B. (1984), "A resource-based view of the firm", *Strategic Management Journal*, Vol. 5 No. 2, pp. 171-180.
- Yevgen, B. and Veit, W. (2017), "Enterprise risk management: a capability-based perspective", *The Journal of Risk Finance*, Vol. 18 No. 3, pp. 234-325.

Further reading

- LE (1992), "Competing on capabilities: the new rules of corporate strategy", *Harvard Business Review*, Vol. 70 No. 2, pp. 57-69.

364

Table A1.
Item modification
references (5-point
Likert scale: 1-strongly
disagree to 5-
strongly agree)

Item	Source	Item	Source
URRM1	AAA (2013)	RAA2	IAA (2008)
URRM2	S&P (2005)	RAA3	AAA, 2013; EU solvency II
URRM3	S&P (2005)	RAA4	Hameeda and Al-Ajmi (2012)
RI1	Hameeda and Al-Ajmi (2012)	RMON1	S&P (2005)
RI2	S&P, 2005, AAA, 2013	RMON2	S&P (2005)
RI3	EU solvency II Directive	RMP1	S&P (2005)
RAA1	IAA (2008)	RMP2	AAA (2013)

Table A2.
Items description

Item	Description
URRM1	There is a common understanding of our organizational risk profile at all levels
URRM2	There is a common understanding of our organizational risk appetite at all levels
URRM3	There is a common understanding of our organizational risk tolerance at all levels
RI1	Our risk management strategy is in agreement with our organizational objectives
RI2	We have an effective risk identification in place
RI3	Our risk identification procedure is comprehensive
RAA1	Potential shocks (risks) to our business are assessed by using quantitative analysis methods
RAA2	Potential shocks (risks) to our business are assessed by using qualitative analysis methods (e.g. high, moderate and low)
RAA3	Our response to analyzing risk includes prioritizing risk and selecting those that need active management
RAA4	Our response to analyzing risks are hindered by resource constraints
RMON1	Responsibility for risk management is clearly set out and understood at all levels
RMON2	Accountability for risk management is clearly set out and understood at all levels
RMP1	Our risk management procedures and processes are documented and provide guidance to staff about managing risks
RMP2	Our organizational policy encourages training programs in the area of risk management as well as, business ethics

Table A3.
Constructs Correlation
matrix

Constructs	URRM	RI	RAA	RMON	RMP
URRM	1				
RI	0.683	1			
RAA	0.572	0.723	1		
RMON	0.760	0.765	0.661	1	
RMP	0.622	0.710	0.677	0.722	1

Note(s): all the correlations were significant at 0.01 level

	US					UK					China					Pakistan				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
URRM1	3.7	3.7	18.5	40.7	33.3	0	7.1	7.1	64.3	21.4	1.9	7.8	23.3	54.4	12.6	7.6	25.8	10.6	51.5	4.5
URRM2	3.7	11.1	14.8	37	33.3	3.6	14.3	0	75	7.1	1	10.7	18.4	54.4	15.5	4.5	22.7	18.2	48.5	6.1
URRM3	7.4	3.7	22.2	40.7	25.9	0	10.7	7.1	78.6	3.6	1	5.8	23.3	56.3	13.6	3	28.8	16.7	45.5	6.1
URRM4	0	18.5	3.7	40.7	37	0	7.1	7.1	67.9	17.9	1.9	12.6	14.6	57.3	13.6	1.5	25.8	12.1	47	13.6
URRM5	0	11.1	25.9	29.6	33.3	0	7.1	10.7	60.7	21.4	3.9	9.7	17.5	56.3	12.6	7.6	25.8	9.1	48.5	16.7
URRM6	3.7	7.4	22.2	25.9	40.7	3.6	3.6	14.3	28.6	50	4.9	3.9	37.9	41.7	11.7	7.6	21.2	36.4	28.8	6.1
URRM7	0	3.7	29.6	40.7	25.9	0	7.1	32.1	35.7	25	1.9	6.8	37.9	35.9	17.5	3	13.6	36.4	36.4	13.6
URRM8	0	3.7	22.2	33.3	40.7	3.6	3.6	7.1	46.4	39.3	1	3.9	15.5	66	13.6	3	19.7	15.2	53	9.1
URRM9	0	3.7	22.2	29.6	48.1	3.6	3.6	7.1	39.3	46.4	1	7.8	19.4	52.4	19.4	4.5	19.7	15.2	48.5	12.1
RI1	0	11.1	11.1	37	40.7	3.6	3.6	7.1	64.3	21.4	1.9	1.9	28.2	51.5	16.5	1.5	25.8	13.6	53	6.1
RI2	0	7.4	18.5	51.9	22.2	3.6	3.6	7.1	71.4	14.3	2.9	7.8	36.9	44.7	7.8	1.5	22.7	19.7	51.5	4.5
RAA1	0	0	3.7	48.1	48.1	3.6	3.6	25	57.1	10.7	1	6.8	23.3	64.1	4.9	3	16.7	30.3	48.5	1.5
RAA2	3.7	7.4	11.1	33.3	44.4	7.1	0	25	50	17.9	1.9	4.9	31.1	54.4	7.8	1.5	18.2	19.7	54.5	6.1
RAA3	3.7	7.4	33.3	33.3	22.2	3.6	0	21.4	53.6	21.4	0	4.9	44.7	39.8	10.7	4.5	16.7	30.3	42.4	6.1
RAA4	0	7.4	11.1	37	44.4	0	0	14.3	53.6	32.1	0	2.9	27.2	60.2	9.7	3	15.2	15.2	62.1	4.5
RAA5	0	11.1	22.2	37	29.6	0	3.6	28.6	46.4	21.4	0	1	34	56.3	8.7	3	4.5	31.8	57.6	3
RMON1	3.7	7.4	18.5	33.3	37	3.6	3.6	17.9	50	25	1	4.9	27.2	57.3	9.7	3	9.1	19.7	62.1	6.1
RMON2		7.4	22.2	25.9	44.4	3.6	3.6	21.4	46.4	25	0	4.9	28.2	57.3	9.7	1.5	3	33.3	53	9.1
RMON3			18.5	44.4	37	3.6	0	14.3	60.7	21.4	0	1	28.2	53.4	17.5	1.5	12.1	25.8	54.5	6.1
RMON4		3.7	14.8	40.7	40.7	0	7.1	7.1	50	35.7	1	3.9	27.2	56.3	11.7	1.5	4.5	24.2	63.6	6.1
RMP1	7.4		7.4	51.9	33.3	3.6	0	10.7	60.7	25	1.9	5.8	28.2	49.5	14.6	1.5	3	21.2	56.1	18.2
RMP2	3.7	11.1	3.7	40.7	40.7	3.6	3.6	10.7	64.3	17.9	1	10.7	26.2	55.3	6.8	3	10.6	18.2	56.1	12.1
RMP3	3.7	7.4		37	51.9	0	3.6	17.9	53.6	25	0	10.7	22.3	54.4	12.6	3	13.6	21.2	51.5	10.6

Insurers' RM
as a business
process

Table A4.
Percentage
distribution by
countries

Figure A1.
Proposed RM model
relationships

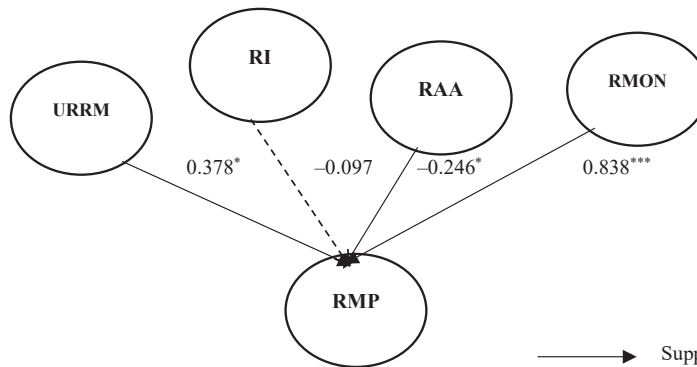
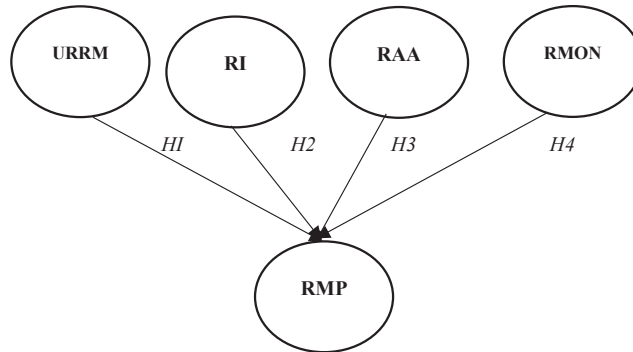


Figure A2.
Standardized
regression estimates
for SEM analysis

Note(s): *** ρ – value < 0.1; ** ρ – value < 0.05; * ρ – value < 0.001;

—————▶ Supported relationship
-----▶ Unsupported relationship

Corresponding author

Danish Ahmed can be contacted at: danish.ahmed88@live.com

The current issue and full text archive of this journal is available on Emerald Insight at:
<https://www.emerald.com/insight/2444-8494.htm>

From knowledge to wisdom: will wisdom management replace knowledge management?

From
knowledge
to wisdom

367

Maria Jakubik
Social Sciences, Ronin Institute, Montclair, New Jersey, USA, and
Peeter Mürsepp
Department of Law, Tallinn University of Technology, Tallinn, Estonia

Received 30 July 2021
Revised 7 August 2021
16 September 2021
1 October 2021
Accepted 1 October 2021

Abstract

Purpose – This conceptual paper aims to contribute to the knowledge management (KM) literature by seeking to determine whether wisdom management (WM) will replace KM in future.

Design/methodology/approach – This exploratory paper follows the interpretivist research philosophy and the deductive approach. The data collection is based on selected literatures from three disciplines (KM, philosophy and psychology). The findings were qualitatively analysed.

Findings – The findings are threefold: (1) the discussion of wisdom has been either neglected or superficially discussed in the KM literature; (2) despite the fact that wisdom is widely discussed and researched in philosophy and psychology disciplines, there is no commonly agreed upon definition of wisdom, and a dichotomy exists between the implicit and explicit theories of wisdom; (3) wisdom research in philosophy and psychology disciplines provides valuable input to KM by identifying the dimensions, components and characteristics of wisdom and wise individuals.

Research limitations/implications – Important sources may have been unintentionally overlooked in this paper. This paper identifies the need for empirical research and discussion about WM as the next potential phase of KM. It offers several implications for researchers, managers and management educators as this paper shows that WM is emerging as a new discipline.

Originality/value – This paper makes a theoretical contribution to the fifth phase of KM by drawing attention to wisdom and WM as the next potential phase of KM.

Keywords Knowledge management (KM), Wisdom management (WM), Data-information-knowledge-wisdom (DIKW), Intelligence, Wisdom

Paper type Conceptual paper

1. Introduction

Debates and views regarding wisdom have become especially significant during the global COVID-19 pandemic. Researchers (Karami and Parra-Martinez, 2021) have pondered on the foolish and wise behaviour of people in a time of crisis. Will people return to their pre-crisis practices after the pandemic subsides? Can we learn from history and from the hidden wisdom of the world's oldest civilizations? For example, can we learn important lessons from the Australian Aboriginal society's model for sustainability that has survived for thousands of years? Sveiby and Skuthorpe (2006) studied the hidden wisdom of the Nhunggabarra people in Australia. They summarised the Nhunggabarra people's "recipe" for a sustainable

JEL Classification — M10 (General business administration)

© Maria Jakubik and Peeter Mürsepp. Published in *European Journal of Management and Business Economics*. Published by Emerald Publishing Limited. This article is published under the Creative Commons Attribution (CC BY 4.0) licence. Anyone may reproduce, distribute, translate and create derivative works of this article (for both commercial and non-commercial purposes), subject to full attribution to the original publication and authors. The full terms of this licence may be seen at <http://creativecommons.org/licenses/by/4.0/legalcode>

This paper forms part of a special section "Innovation, Management, and Governance for Sustainable Growth", guest edited by Alba Yela.



European Journal of Management
and Business Economics
Vol. 31 No. 3, 2022
pp. 367-389
Emerald Publishing Limited
e-ISSN: 2444-8494
p-ISSN: 2444-8451
DOI 10.1108/EJMBE-07-2021-0219

society as follows: mission – keep everyone alive; core belief – all are connected; core value – respect; economy – intangible; ecosystem – based on care; primary resource – knowledge; leadership – all members of society play a role and society – building a sense of community among people (pp. 170–171). Researchers hope that the COVID-19 pandemic will help people to stop, think about, learn from and reflect upon their values, pre-crisis actions and practices. A crisis is an excellent opportunity to create a better world by learning what worked well in the past, and at the same time by “unlearning” any harmful practices. Nevertheless, there remain several unanswered questions: Will people act upon the newfound wisdom? Will they put this newfound learning, knowledge and wisdom into practice? Will retrospective sensemaking take place in management? If yes, how will it impact managerial practices? Will the role of wisdom be amplified in management?

Recently, research on wisdom in management has been receiving increased attention (Bachmann *et al.*, 2018; Banerjee, 2014; Ekmekçi *et al.*, 2014; Jakubik, 2021a; McKenna and Rooney, 2005; McKenna *et al.*, 2009; Müürsepp, 2021; Nonaka *et al.*, 2014; Rooney *et al.*, 2010; Solé, 2017). Furthermore, there exist intense discourses on intelligent work, intelligent workers, wisdom workers, wisdom organisations, wisdom capital and the wisdom economy and wisdom society (Dobson, 2010; Jakubik, 2020a; Liew, 2013; Maxwell, 2021; Müürsepp, 2013a, b, 2021; Pink, 2006; Stebbins, 2017; Vasconcelos, 2021). Additionally, since the 1980s, research on wisdom in psychology has intensified (Ardelt, 2004; Baltes and Staudinger, 2000; Bangen *et al.*, 2013; Jeste *et al.*, 2010; Karami *et al.*, 2020; Karami and Parra-Martinez, 2021; Sternberg and Karami, 2021).

Furthermore, this research topic is important because there is an amplified need not only for research regarding knowledge but also regarding wisdom to successfully address global financial, economic, environmental, humanitarian, health and moral crises of society. The findings of this paper indicate that there is a gap in the knowledge management (KM) literature regarding wisdom because wisdom has been either entirely ignored or only superficially discussed (Allee, 2003, pp. 67–68; Bennet and Porter, 2003; Hislop, 2009; Holsapple, 2003, pp. 467–487; Jashapara, 2004, pp. 14–41; Jennex, 2017; Jennex and Bartczak, 2013; Serenko, 2013, 2021; Serenko and Bontis, 2017, 2021; Skyrme, 2003). This was a surprising finding because the key concepts of wisdom (*episteme*, *techné*, *phronesis*, data, information, knowledge, knowing, etc.) are central to both KM and wisdom research. Therefore, this paper's authors argue that exploring wisdom in the philosophy and psychology literature could be a valuable contribution to the KM literature and facilitate the understanding of wisdom management (WM).

This research topic is future-oriented because it focuses on a potential next phase of KM which has had several development phases since the 1990s. Bencsik *et al.* (2020, pp. 31–32) referred to Jakubik (2007, 2011), who identified five phases of KM, and to Serenko (2013), who defined four generations of KM. According to Jakubik (2007, 2011), the five distinctive phases of KM theory development are: the foundation of KM theory in the mid-1990s, the unified model of dynamic knowledge creation, emphasis on the context and roles of leaders and managers, the justification process of organisational knowledge and the need for a new theory of the knowledge-based firm, with the focus on situation, process, action and change. The four generations of KM identified by Serenko (2013) are outlined below:

- (1) Prior to the mid-1990s, a techno-centric view of knowledge processes and knowledge sharing was initiated. It was driven by management, focusing on explicit knowledge.
- (2) From the mid-1990s to the early 2000s, human factors and intellectual capital became important, and organisational learning, social and cultural aspects, and knowledge sharing processes were initiated and driven by individual employees in their daily practices.

- (3) Early 2000s-2013: Culture and contextual aspects became important, in addition to social learning, collaboration, democratisation of knowledge, involvement and managing knowledge as a flow.
- (4) Since 2013, knowledge has been perceived as a relationship, a shift to the intangible mind economy and a transition to networked organisations.

KM is an evolving discipline. Serenko (2021) identified five phases of evolution in the research focus and methods of the KM discipline: 1996–2001 (initiation), 2002–2006 (early development), 2007–2012 (rigour and consolidation), 2013–2016 (methodological advancement) and 2017–2019 (maturity phase). Serenko (2021) concluded the following: “A unique attribute of the Methodological Advancement and Maturity phases is a high degree of specialization when over half of all studies are conducted in a unique context of specific topics, publication forums, geographic regions and groups of people”. Therefore, it is important to determine whether wisdom will attract more attention in KM research in future, and whether WM will be the next phase of KM or replace KM. Indeed, there is a need for a better understanding of the concept of wisdom from a broader perspective, in addition to the need for related contributions to the KM literature. The authors of this paper argue for more attention to and understanding of wisdom in KM because wisdom is starting to play a vital role in our society, economy and life. Consequently, the research question is formulated as follows: “*Will WM replace KM?*”

The remainder of this paper proceeds as follows. Section 2 outlines the research design, including the research question and objectives, research methodology and research and theoretical frameworks. Section 3 presents the findings, and Section 4 discusses the findings, formulates questions emerging from the literature review and concludes with managerial and educational implications, limitations and future research directions.

2. Research design

The research question is: will WM replace KM? The research objectives are: (1) to explore how wisdom is presented in the KM literature, and to determine whether there is a need for a better understanding of wisdom in KM, (2) to explore wisdom as a concept in the philosophy and psychology literature, (3) to recognise how understanding of wisdom from the philosophy and psychology literature could contribute to the KM literature and (4) to contemplate whether WM is the potential next phase of KM or whether it will emerge as a new discipline and replace KM. Figure 1 presents the research framework and questions.

This conceptual paper is an exploratory research that follows the interpretivist research philosophy and deductive approach. The data collection is based on selected literatures from three disciplines (KM, philosophy, psychology). The findings were qualitatively analysed.

3. Findings

The first research objective is to explore how wisdom is presented in the KM literature and whether there is a need for a better understanding of wisdom in KM.

3.1 *Wisdom in the KM literature*

In the KM literature, wisdom is either entirely ignored or only superficially discussed. KM has been developing from information and computer sciences since the late 1980s (Dalkir, 2011, pp. 15–19). In almost all KM literatures, the DIKW (data-information-knowledge-wisdom) or DIKWT (data-information-knowledge-wisdom-truth) framework is discussed in order to establish the need of the next phase of KM after data and information management. Knowledge is mainly explained in the KM literature as the next phase of data and information management and wisdom is described as the next phase of knowledge. Styhre (2003, pp. 57–65)

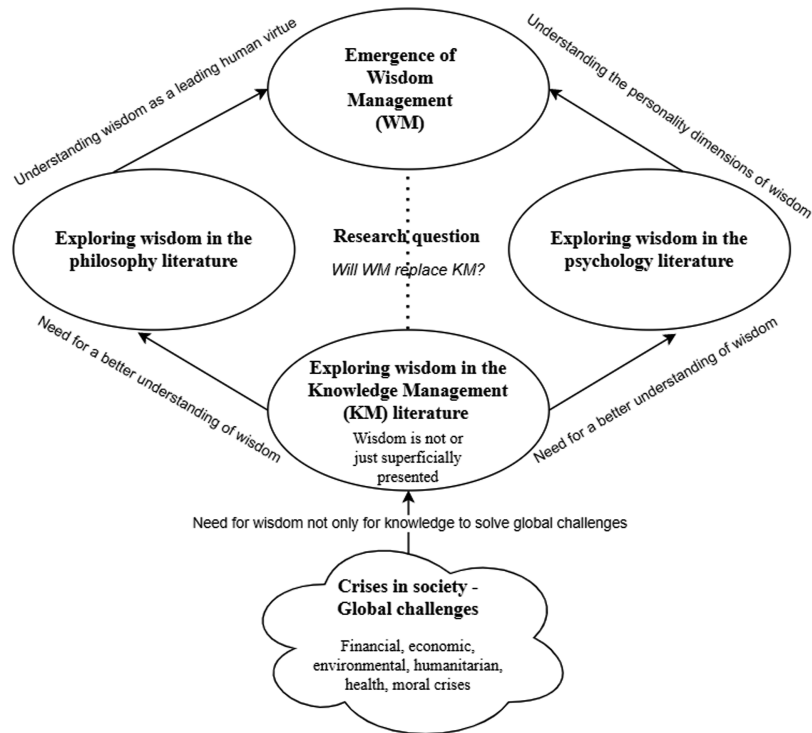


Figure 1.
Research framework

Source(s): Jakubik

argued that it is difficult to conceptualise knowledge. He referred to Bierly *et al.* (2000), who expanded the DIK (data-information-knowledge) framework with the concept of wisdom. Wisdom is “using knowledge to establish and achieve goals” through “discerning judgements and taking appropriate action” with the outcome of “better living/success” (Styhre, 2003, p. 598).

Jashapara (2004, pp. 14–41) discussed the differences between data, information, knowledge and wisdom and stated the following: “Wisdom and truth have been shown to have higher qualities than knowledge in the hierarchy. Wisdom is the ability to act critically or practically in a given situation. It is based on ethical judgement related to an individual’s belief system” (pp. 17–18). As a further elaboration of the DIKW model, Liew (2013) proposed a DIKIW model, in which the link between knowledge and wisdom is intelligence. He argued that restructuring mental processes leads from knowledge to intelligence, and that an understanding of universal truth, sound judgement and appropriate execution leads from intelligence to wisdom. Similarly, according to Jakubik (2020a), intelligent work is replacing knowledge work, and that intelligent workers are replacing knowledge workers.

The revision and extension of the DIKW pyramid is necessary. Jennex (2017, p. 71) aimed “to place the knowledge hierarchy within the context of the natural or real world. What it shows is that data, information, knowledge, and wisdom exist in a broader context, i.e. humans are constantly gathering and processing data into information, knowledge, and wisdom”. Jennex and Bartzcak (2013, pp. 20–21) argued that “wisdom is placing knowledge into a framework or nomological net that allows the knowledge to be applied to different and

not necessarily intuitive situations". In their view, the extended KM pyramid should also include big data, Internet of things (IoT), organisational learning and intelligence.

According to Boisot (1995, p. 160), knowledge is created in the information space (i.e. I-space), which is an integration of three spaces: epistemological (E-space), utility (U-space) and cultural (C-space). He stated the following: "Knowledge is a capacity that is built on information extracted from data" (Boisot, 1999, p. 14). He discussed knowledge, information and data (Boisot, 1999, pp. 10–20), value and wealth creation, the social learning cycle (Boisot, 1999, p. 60) and knowledge hoarding and sharing in the I-space; however, he does not mention wisdom *per se*. Boisot, however, talked about "insight" and argued that "without a steady accumulation of experiential data, the act of insight has nothing to feed on. Without some fundamental insight, on the other hand, experiential learning has nothing to build on" (Boisot, 1999, p. 35).

Allee (2003) presented different knowledge modes as data, information (procedures), knowledge (functions), meaning (context), philosophy (systems), wisdom (renewal) and union (sustainability). She identified wisdom as one level (i.e. renewal) of knowledge complexity, on which we realise that "an organization's character, identity, purpose and values really stand for something and are at the heart of a successful enterprise. They serve as the 'strange attractors' that draw people together" (Allee, 2003, p. 68). Similarly, Skyrme (2003, p. 47) discussed the knowledge hierarchy as DIKW; he defined wisdom as "knowledge with insight". Interestingly, he argued that knowledge develops through individual relationships as a "relationship involves shared knowledge and understanding—not just of needs and factual information, but of a deeper knowledge such as behaviors, motivations, personal characteristics, ambitions and feelings" (Skyrme, 2003, p. 57). Could this "deeper knowledge with insight" be called "wisdom"?

Others discuss wisdom as a concept very lightly, for example, Bennet and Porter (2003) argued that "wisdom occurs when knowledge is integrated with a strong value set and acted upon with courage". Their model, *the growth path of KM implementation* (Bennet and Porter, 2003) showed how the growth of knowledge and sharing through heightened consciousness and connectedness lead to wisdom. They stated the following: "Through leading and teaching (leadership and education), this wisdom facilitates the growth of new concepts and an expanded connectedness with individuals and organizations around the world. It is at this level in the growth of knowledge and sharing where we have enough wisdom and knowledge to create and share new thoughts in a fully aware and conscious process" (Bennet and Porter, 2003, p. 484).

In KM, similar to psychology research (Dittmann-Kohli and Baltes, 1990; Pasupathi *et al.*, 2001), wisdom is related to intellectual growth, wise persons and experts. Becerra-Fernandez *et al.* (2004, pp. 21–23) in their work on KM did not mention wisdom *per se*. However, they described experts as individuals having many different skills and types of knowledge. They distinguished between associational expertise, motor skills and theoretical (deep) expertise. Davenport and Prusak (2000, p. 2) stated that for practical purposes, they will "lump higher order concepts such as wisdom and insight into knowledge". However, they discussed data, information and knowledge, and provided a working definition of knowledge related to experts' insight: "Knowledge is a fluid mix of framed experience, values, contextual information and *expert insight* . . . It originates and is applied in the *minds of knowers* . . . it often becomes embedded not only in documents or repositories, but also in organizational routines, processes, practices and norms" (Davenport and Prusak, 2000, p. 5, emphases added).

Thus, there is a need to re-humanize KM. This paper's authors concur with Hislop (2009), who identified five main problems in the KM literature: ontological incoherence, vagueness, an all-embracing and empty view of knowledge, objectivity and functionalism. Alvesson and Kärreman (2001) argued that "conceptualizations of knowledge in this literature are generally weak, sloppy, contradictory and do not stand up to rigorous criticism"

(Hislop, 2009, p. 272). Another criticism added by Hislop (2009, p. 273) is that “the literature on knowledge management produced by those from the academic disciplines of IS/IT and computing”.

Nevertheless, KM authors began to focus on understanding the human factors, processes, context and interactions in knowledge creation (Bencsik *et al.*, 2020; Jakubik, 2007, 2011; Nonaka *et al.*, 2008, 2014; Nonaka and Takeuchi, 2011; Nonaka and Toyama, 2002; Serenko, 2013, 2021; Serenko and Bontis, 2017, 2021; Vasconcelos, 2021). Since year 2000, Nonaka *et al.* (2008) demonstrated the importance of practical wisdom (*phronesis*) and wise leadership in KM. Similarly, Jakubik (2011) called for shifting the knowledge creation paradigm and focusing on engaging in knowledge creation with identity, purpose, values, beliefs, expectations and goals. Serenko (2013) also claimed that since year 2013, the fourth generation of KM is evolving in which knowledge is seen as a relationship, a shift to the intangible mind economy and a transition to networked organisations.

Research topics in KM have been evolving. Serenko and Bontis (2017, pp. 680–681) studied 27 KM and Intellectual Capital (IC) related academic journals. Based on their survey of 482 experts, Serenko and Bontis (2017, p. 680) concluded that compared with their 2012 research, “First, there was a substantial increase in the KM/IC topics from 10 to 17%. Second, cognitive, personnel and industrial and organizational psychology emerged as a small-yet-noticeable category”. Related to the primary research areas, they concluded that “there was an increase in KM as a primary research area from 24 to 36%”. In 2020, Serenko and Bontis (2021) repeated their global ranking for 28 KM/IC academic journals. According to 463 responses of experts, they claimed that “Compared to the previous ranking study, fewer responders indicated KM as their primary and secondary research areas, while there was a slight increase in the number of scholars focusing on computer science/information technology/information systems/library and information science (CS/IT/IS/LIS), informatics, accounting and finance and IC”. However, other primary research areas (27%) emerged, such as education, entrepreneurship, operations management, management science, economics and ethics (Figure 1). These trends in research topics indicate a shift toward the importance of human factors in KM.

A better understanding of KM from the human perspective is taking place currently. A structured literature review of KM for the 2012–2019 period, conducted by Serenko (2021), underlines this trend. Regarding topics in KM, he concluded that there “was a noticeable increase in some topics, such as the intellectual core of the KM field; productivity and impact studies; and collaboration patterns”. For example, the economic consequences of trust and distrust in knowledge-intensive organisations (Bencsik *et al.*, 2020), and the importance of human values and human interactions in KM research. Furthermore, Vasconcelos (2021) proposed the wisdom capital concept, which is highly relevant to KM, and presented his two-level model. He argued that individual wisdom capital (IWC) means doing good, doing right, excellence, improving society, serving others and oneself and organisational wisdom capital (OWC) includes greater good, common good, human good and well-being.

The findings demonstrate the need for a more human-based approach compared to the IS/IT-based approach in KM and “for a paradigm shift in thinking about knowledge and the need for *integrating philosophical ideas and concepts into the theory*” of knowledge creation (Jakubik, 2011, p. 380, emphasis added). These needs are underscored by the fact that KM is multidisciplinary, as it has its roots not only in information and computer sciences, but also in philosophy, psychology, sociology, anthropology, education and management (cf. Jashapara, 2004, p. 10). There have also been attempts to explain the foundations of KM from a philosophical perspective. For example, Fuller (2002, pp. 58–67), through seven theses and antitheses, discussed the philosophical problem of knowledge, power and knowledge and knowledge as justified true beliefs. However, he did not discuss wisdom *per se*. This paper’s authors, concurring with Alvansson and Kärreman (2001), Jashapara (2004), Hislop (2009)

and Jakubik (2011), argue that it is time to contribute to the KM literature and show how wisdom is presented in the philosophy and psychology literature.

3.2 *Wisdom defined in philosophy*

The second research objective is to explore wisdom as a concept in the philosophy literature. Philosophy is the study of wisdom. Philosophers have always been fascinated about how people gain knowledge. Kant argued that experience in time and space translates into science through interactions between perceptual and conceptual knowledge. "Sensation is unorganized stimulus, perception is organized sensation, conception is organized perception, science is organized knowledge, wisdom is organized life and our purpose puts them into sequence, order and unity. Perceptions without conceptions are blind" (Durant, 1954, p. 271). Therefore, it is important to explore how wisdom, as the leading virtue, has been defined by philosophers. The Greek philosophers Socrates, Plato and Aristotle expressed their views on intelligence, excellence, goodness, morals, virtue and wisdom. Socrates focused on knowledge and wisdom of life (*Sophia*), Plato on ideas and wisdom of knowledge (*episteme*) and Aristotle on practical wisdom (*phronesis*). Plato (1953) wrote, "*good meant intelligent, and virtue meant wisdom*" (Durant, 1954, p. 8, emphasizes original). Plato called this "virtue harmonious action" and Socrates "identified virtue with knowledge" (Durant, 1954, p. 77). Aristotle (1962) assumed that virtue "is the achievement of experience" (Durant, 1954, p. 75), and "we do not act rightly because we have virtue or excellence, but we rather have these because we have acted rightly; "these virtues are formed in man by his doing the actions"; we are what we repeatedly do" (Durant, 1954, p. 76).

There are several thoughts based on the ethical principles of the stoics (Epictetus, Seneca, Marcus Aurelius) that are worthwhile to consider for current times, and perhaps especially during the current COVID-19 pandemic. Seneca had "enthusiasm for learning" and he argued that this is the way to achieve wisdom. Learning and studies should be guided by wisdom, "Moral values (i.e. wisdom) are things which have to be learnt . . . wisdom does not lie in books. Wisdom publishes not words but truths" (Seneca, 1969, p. 158). He stated that wisdom is about physical and human matters, past and future, questions about things ephemeral, questions about time and the soul. He strongly believed that wisdom needs to be shared with others "*if wisdom were offered me on the condition that I should keep it shut and not divulge it to anyone, I should reject it*. There is no enjoying the possession of anything valuable unless one has someone to share with" (Seneca, 1969, pp. 39–40, emphasis added). "Virtue has to be learnt" (Seneca, 1969, p. 231). He argued that wisdom is important for a happy life because "no one can lead a happy life . . . without the pursuit of wisdom, and that the perfection of wisdom is what makes the happy life, although even the beginnings of wisdom make life bearable" (Seneca, 1969, p. 63). Additionally, he stated the following: "virtue comes to a character thoroughly schooled and trained and brought to a pitch of perfection by unremitting practice. We are born for it but not with it" (Seneca, 1969, pp. 176–177). Seneca pointed out that "Without wisdom, the mind is sick" (Seneca, 1969, p. 60).

Maxwell (2021a, b) criticised university education and advocated the need to shift the focus of scientific research from obtaining knowledge to wisdom. "Instead of giving priority to solving problems of knowledge, universities need to give priority to problems of living" (Maxwell, 2021a, p. 2). According to him, knowledge inquiry is important, but wisdom inquiry should be the priority in education. Knowledge inquiry seeks pieces of reliable knowledge in the context of science, remaining in strictly limited disciplinary borders. On the other hand, wisdom inquiry refers to interdisciplinary research based on specially arranged research groups solving real problems of living of both individuals and the humanity, including global problems (Maxwell, 2021b). The following Maxwell's (1984, p. 66) definition of wisdom put forward a more practical understanding of wisdom as compared to that from the classical philosophy:

Wisdom is the desire, the active endeavour, and the capacity to discover and achieve what is desirable and of value in life, both for oneself and for others. Wisdom includes knowledge and understanding but goes beyond them in also including: the desire and active striving for what is of value, the ability to see what is of value, actually and potentially, in the circumstances of life, the ability to experience value, the capacity to use and develop knowledge, technology and understanding as needed for the realization of value. Wisdom, like knowledge, can be conceived of, not only in personal terms, but also in institutional or social terms. We can thus interpret [wisdom-inquiry] as asserting: the basic task of rational inquiry is to help us develop wiser ways of living, wiser institutions, customs and social relations, a wiser world.

Similar to Maxwell (1984), Stebbins (2017) employed a practical approach to wisdom to compare KM and WM. He argued that KM is about achieving more with the help of pure rationality and WM is about combining the mind, heart and hunch. This is in accordance with Maxwell (1984). For Stebbins (cf. Aristotle, Seneca), “wisdom is learning how to access that information through head, which is an intellectual process, heart, which involves empathy, compassion and loving, and hunch, which calls upon intuition” (Stebbins, 2017, p. 6). However, KM works mainly through the head as an intellectual process.

In summary, this non-comprehensive overview of wisdom from leading philosophers first shows that wisdom has been an ongoing topic throughout human history and, second, illustrates what philosophy could offer to KM for a better understanding of wisdom. Wisdom is a leading human virtue that continues developing throughout our lives. Wisdom research in psychology explores how wisdom is related to personality characteristics.

3.3 Wisdom in the psychology literature

The second research objective of this paper also includes the exploration of wisdom in the psychology literature and to examine what it can offer to KM. There are two distinctive streams of wisdom research in psychology. Researchers of implicit theories (e.g. Ardel, 2000, 2003; Webster, 2003) focus on the cognitive, reflective and affective dimensions of wisdom. They aim to identify the factors that influence wisdom, the dimensions and qualities of wisdom, and the characteristics of wise individuals, as well as the impacts of culture, practices, experiences and age on wisdom. On the other hand, researchers of wisdom of the explicit stream (e.g. Baltes and Staudinger, 2000; Kunzman and Baltes, 2003; Pasupathi and Staudinger, 2001), focus on how wisdom is expressed in the behaviour of persons, in experts’ knowledge and actions and in practical intelligence. They aim to measure the wise performance.

Is there a common definition of wisdom? The concept of wisdom has been studied and viewed from different disciplines: philosophy (*Sophia*, *phronesis* and *episteme*), history and cultures (Eastern vs. Western cultures), theology (meditation, cogitation and contemplation), anthropology (age, culture, social context and family), biology, neurobiology (brain functions), psychology (personality, introvert, extravert, affective, cognitive and reflective qualities) and education (learning, cognitive development of children and adults). Therefore, several definitions of wisdom exist. The following are a few examples to illustrate the diverse definitions of wisdom from a psychological perspective.

- (1) Wisdom is gained through resolving daily crises (Erikson, 1959).
- (2) Wisdom is “uniquely human, a form of advanced cognitive and emotional development that is experience driven” (Jeste *et al.*, 2010, p. 668). It can be learned; it increases with age and can be measured.
- (3) Wisdom builds on knowledge, cognitive skills and personality characteristics, and requires an understanding of the cultural context (Sternberg, 1990, 1998; Sternberg and Karami, 2021).

- (4) “According to Sternberg, wisdom involves forming a judgment when there are competing interests that lack resolution” (Lopez *et al.*, 2015, p. 229).
- (5) “Sternberg proposed that knowledge, judicial thinking style, personality, motivation, and environmental context precede wisdom” (Lopez *et al.*, 2015, p. 232).
- (6) Wisdom is the “ways and means of planning, managing and understanding a good life”, and “wisdom is an expertise in conduct and meaning of life” (Baltes and Staudinger, 2000, p. 124).
- (7) Baltes and Staudinger (2000) suggested that “fluid intelligence, creativity, openness to experience, psychological-mindedness, and general life experiences ‘orchestrate’ to produce wisdom” (Lopez *et al.*, 2015, p. 232).
- (8) Baltes and Staudinger (2000, p. 132) define the characteristics of wisdom as (1) strategies and goals involving the conduct and meaning of life; (2) the limits of knowledge and the uncertainties of the world; (3) excellence of judgement and advice; (4) knowledge with extraordinary scope, depth and balance; (5) the search for a perfect synergy of mind and character; and (6) balancing the good or well-being of oneself and that of others.

What are the main components of wisdom? Bangen *et al.* (2013, 1257), in their extensive literature review of wisdom theories, categorised the authors who defined wisdom based on subcomponents of wisdom, such as decision-making knowledge (23), prosocial attitudes (21), self-reflection (19), acknowledgement of uncertainty (16), emotional homeostasis (13), tolerance (7), openness (5), spirituality (5) and sense of humour (3). The numbers in parentheses after the subcomponents of wisdom indicate the frequency of the specific subcomponent in the definitions found in the reviewed literatures. Bangen *et al.* (2013, p. 1262) concluded that “the most commonly cited subcomponents, which appeared in at least half of the definitions, relate to social decision-making/knowledge of life, prosocial values, reflection and acknowledgement of uncertainty”. Thus, because different disciplines approached wisdom from their own perspectives, there are several definitions of wisdom and “a generally agreed-upon definition of wisdom does not yet exist” (Ardelt, 2004, p. 258).

What are the main characteristics of wisdom? Recently, Karami *et al.* (2020) conducted a systematic literature review of 50 wisdom articles published between 2006 and 2018 in psychology, management and leadership and education. According to them, wisdom is the “dynamic balance and synthesis translated into action”. Their Polyhedron Model of Wisdom (Karami *et al.*, p. 246) includes six components: KM, altruism and moral maturity, sound judgement and decision-making, intelligence and creative thinking, openness and tolerance and self-regulation. According to them, the KM component (including factual, procedural, conceptual, meta knowledge and application of knowledge), was considered an important component of wisdom in 37 out of 50 articles. Wisdom starts by realising what we do not know, and reflecting on our foolishness (Karami and Parra-Martinez, 2021). Wisdom seems to be the opposite of foolishness. A foolish person is characterised by self-perceived omniscience, omnipotence, invulnerability, egocentrism and unrealistic optimism. A wise person actively seeks a wide range of knowledge, is capable of applying that knowledge in different situations and contexts, and is capable of addressing challenging problems.

What is wisdom? – Recently, Sternberg and Karami (2021, p. 4) developed and discussed a 6P framework for wisdom; “The six Ps in this article with regard to wisdom will refer to the (1) Purpose of wisdom, (2) environmental/situational Press that produce wisdom, (3) nature of Problems requiring wisdom, (4) cognitive, metacognitive, affective, and conative (motivational) aspects of Persons who are wise, (5) psychological Processes underlying wisdom, and (6) Products of wisdom’. This paper’s authors concur with Sternberg and

Karami (2021, p. 15) and Maxwell (2021), and argue that because of the global problems in our society (cf. Figure 1), wisdom has become more important than ever before, and that this concept cannot be ignored by KM.

The third research objective of this paper is to recognise how understanding wisdom from the philosophy and psychology literature could contribute to the KM literature. In summary, the findings are threefold: (1) there is a clear need for contributions regarding wisdom from the psychology and philosophy perspectives to the KM literature because the discussion of wisdom has been either neglected or superficially discussed in the KM literature; (2) despite the fact that wisdom is widely discussed and researched in philosophy and psychology, there is no commonly agreed upon definition of wisdom and a dichotomy exists between the implicit and explicit theories of wisdom. (3) wisdom research in philosophy and psychology provides valuable input to KM because these disciplines identify the dimensions, components and characteristics of wisdom and a wise person. The findings of this exploratory paper are summarised in Table 1.

4. Discussion and conclusions

The fourth research objective is to contemplate and discuss whether WM is the next phase of KM or whether it will emerge as a new discipline and replace KM. The paper concludes with managerial and educational implications, limitations and future research directions.

4.1 Wisdom management

Five questions emerged from this exploratory research. The first question is: *Are we moving from a knowledge economy to a wisdom economy?* We live in a knowledge, creative and mind economy. However, the wisdom economy needs to be based not only on rationally grounded actions, but on looking into the future, that is, seeing the impact of our actions on the environment, nature, other people and ultimately on humanity as a whole (cf. Maxwell, 2021, Figure 1: Research framework). Our actions must be based on ethical and moral decisions. We should act based on values as well as to achieve the common good. Concurring with Flyvbjerg (2001), management should seek and find answers to the following questions: Where are we going? Who gains, who loses and by which mechanisms of power is this done? Is this development desirable? What should we do about it?

Comparing knowledge and wisdom economies, Dobson (2010) argued that, on the one hand, the knowledge economy focusing on increasing skills and knowledge is innovative, wants more, demands qualifications, is competitive, has the goal of hoarding knowledge, is grasping and is selfish. On the other hand, the wisdom economy is ethical, considers social values, value judgments are attached to knowledge, is reflective, wants innovations with purpose and considers their consequences, understands “*enough*” (cf. Seneca, 1969), demands attitude and aptitude, is collaborative, reinforces sharing knowledge, values community work and relationship-based actions that build self-esteem and skills, is gracious and socially responsible (cf. Sternberg and Karami, 2021). Dobson (2010) concluded that “a wisdom economy isn’t yet another ‘new economy’. But it could give us the tools to make better choices about the one we have got”.

To move from a knowledge to wisdom economy, we need wise leaders. McKenna *et al.* (2009) developed and discussed five propositions for wise leadership. They argued that wise leaders (1) use reason and careful observations, (2) allow for non-rational and subjective elements when making decisions, (3) value humane and virtuous outcomes, (4) have practical actions oriented towards everyday life, including work and (5) are articulate, understand the aesthetic dimension of their work and seek the intrinsic personal and social rewards that contribute to a good life (McKenna *et al.*, 2009, pp. 178–180). Similarly, Nonaka and Takeuchi (2011)

Knowledge management		
Authors	Wisdom defined as	Wisdom-related concepts
Boisot (1995, 1999)	–	<ul style="list-style-type: none"> • Utility space is where value and wealth are created • Social learning cycle • Fundamental insight • Extend the data-information-knowledge framework with wisdom
Bierly <i>et al.</i> (2000)	Wisdom is using knowledge to establish and achieve goals through discerning judgements and taking appropriate action with the outcome of better living/success	
Davenport and Prusak (2000)	–	<ul style="list-style-type: none"> • Experts' insight • Organizational routines • Processes, practices and norms • Power and knowledge • Knowledge as justified true beliefs
Fuller (2002)	–	
Nonaka and Toyama (2002)	Practical wisdom (<i>phronesis</i>) as a creative capacity	–
Allee (2003)	Wisdom as a renewal level of knowledge complexity	<ul style="list-style-type: none"> • Organization's character • Identity, purpose and values – are the heart of a successful enterprise • Consciousness • Connectedness
Bennet and Porter (2003)	Growth of knowledge and sharing through heightened consciousness and connectedness lead to wisdom	
Skyrme (2003)	–	<ul style="list-style-type: none"> • Insight • Deep knowledge (behaviors, motivations, personal characteristics, ambitions and feelings)
Styhre (2003)	Wisdom is the next phase of knowledge	–
Becerra-Fernandez <i>et al.</i> (2004)	–	<ul style="list-style-type: none"> • Experts' knowledge
Jashapara (2004)	Wisdom and truth have been shown to have higher qualities than knowledge Wisdom is the ability to act critically or practically in a given situation Wisdom is based on ethical judgement related to an individual's belief system	–
Pink (2006)	–	<ul style="list-style-type: none"> • Wisdom workers • Cognitive and emotional creativity • Five phases of KM theory development • Focus on situation, process, action and change
Jakubik (2007)	–	<ul style="list-style-type: none"> • Practical rationality to act • Context, Processes and Interactions • Practice-based approach to knowledge management
Nonaka <i>et al.</i> (2008)	Phronesis is an intellectual virtue	
Hislop (2009)	–	<ul style="list-style-type: none"> • Reason and observation • Subjectivity in decision making • Humane and virtuous • Practical actions oriented towards everyday life • Aesthetic dimension of the work • Seek intrinsic personal and social rewards of contributing to the good life
McKenna <i>et al.</i> (2009)	Wise leadership	

Table 1.
Wisdom in the KM,
philosophy and
psychology literature
in a chronological order
(continued)

Knowledge management			
Authors	Wisdom defined as		Wisdom-related concepts
Dobson (2010)	Wisdom economy		<ul style="list-style-type: none"> • Ethical, social values • Being reflective and purposeful • Understanding of “enough” • Demanding attitude and aptitude • Collaborative and value community • Self-esteem • Graciousness • Social responsibility
Jakubik (2011)	–		<ul style="list-style-type: none"> • Engaging in knowledge creation with identity, purpose, values, beliefs, expectations and goals • Becoming to know, Epistemology • Interplay of learning (i.e. sensation and perception) and Knowing (conception and reflection)
Nonaka and Takeuchi (2011)	Practical wisdom, <i>Phronetic</i> leadership, Wise leaders		<ul style="list-style-type: none"> • Judge goodness • Grasp the essence • Communicate the essence • Create shared contexts • Exercise political power • Foster practical wisdom in others • Intelligence • Understanding of universal truth • Sound judgment • Appropriate execution • Intelligence
Liew (2013)	Elements of wisdom: Mindful, knowledgeable, human affairs and virtue Intelligence connects knowledge with wisdom		<ul style="list-style-type: none"> • Extending the DIKW pyramid with Big Data, Internet of Things (IoT), organizational learning, learning and intelligence • Intelligence • Sound judgment • Appropriate execution
Jennex and Bartczak (2013)	Wisdom is placing knowledge into a framework or nomological net that allows the knowledge to be applied to different and not necessarily intuitive situations		<ul style="list-style-type: none"> • Four generations of KM • Since 2013 knowledge is seen as a relationship, a shift to the mind economy and intangible knowledge, and to networking organisations
Serenko (2013)	–		<ul style="list-style-type: none"> • Since 2013 knowledge is seen as a relationship, a shift to the mind economy and intangible knowledge, and to networking organisations
Ekmekeçi <i>et al.</i> (2014) Nonaka <i>et al.</i> (2014)	Wisdom management (WM) Wise and unwise leadership Wisdom is a way of showing what is good, collectively, about an organization and its productive powers, and an understanding the higher moral purpose		<ul style="list-style-type: none"> • Wise leader • Acknowledge the limits and limitations of formal knowledge • Cope with uncertainty • Organizational learning • Learning and intelligence • Revising the knowledge pyramid: Big Data, Internet of Things (IoT)KM
Jennex (2017)	Wisdom and knowledge lead to intelligence		<ul style="list-style-type: none"> • New research topics in KM: cognitive, personnel and industrial and organizational psychology
Serenko and Bontis (2017)	–		<ul style="list-style-type: none"> • KM evolves toward wisdom management (WM)
Solé (2017)	Wisdom is the highest degree of knowledge Wisdom allows one to act wisely		

Table 1.

(continued)

Knowledge management		
Authors	Wisdom defined as	Wisdom-related concepts
Bachmann <i>et al.</i> (2018)	Wisdom has the following features: action-oriented, integrative, normative, sociality-linked, pluralism-related, personality-related, cultural heritage and limitation-related	<ul style="list-style-type: none"> • Features of practical wisdom
Bencsik <i>et al.</i> (2020)	–	<ul style="list-style-type: none"> • Trust and distrust in knowledge-intensive organizations
Jakubik (2020a)	–	<ul style="list-style-type: none"> • Intelligent work • Intelligent workers
Jakubik (2020b)	–	<ul style="list-style-type: none"> • Wisdom in education • Cultivating wisdom in actions of future generations of managers • Moral and ethical values in management education
Jakubik (2021a)	Practical wisdom	<ul style="list-style-type: none"> • Management and leadership practices guided by practical wisdom
Jakubik (2021b)	Practical wisdom	<ul style="list-style-type: none"> • Practical wisdom in higher education
Serenko (2021)	–	<ul style="list-style-type: none"> • Five phases of evolution in KM/IC research (1996–2019)
Serenko and Bontis (2021)	–	<ul style="list-style-type: none"> • Ethics and education as new research areas in KM
Vasconcelos (2021)	Wisdom capital (WC)	<ul style="list-style-type: none"> • Individual wisdom capital (IWC): doing good, doing right, excellence, improve the society, serving others and him/herself • Organizational wisdom capital (OWC): Greater good, common good, human good, well-being
Philosophy		
Authors	Wisdom defined as	Wisdom-related concepts
Socrates (in Durant, 1954)	Virtue means knowledge Know yourself	<ul style="list-style-type: none"> • Curiosity • Debates • Questioning
Plato (1953)	Virtue means wisdom, transforming chaos into creative harmony	<ul style="list-style-type: none"> • Goodness • Intelligence • Education • Power • Wealth • Wisdom is not for slaves it is for educated men (<i>sic.</i>), for the elite only
Aristotle (1962)	Virtues are formed by training and acting rightly, virtue is action tending to produce good, virtue is excellence	<ul style="list-style-type: none"> • Judgment • Self-control • Symmetry of desires • Excellence • Training • Power • Wealth • virtue is not for simple and uneducated men (<i>sic.</i>), not for slaves

(continued)

Table 1.

Philosophy		
Authors	Wisdom defined as	Wisdom-related concepts
Stoics: Epictetus, Seneca, Marcus Aurelius (in Russell, 1954)	Virtue is the only true good Virtue . . . rests entirely with the individual Virtue is due to the good influence of parents, grandparents and teachers	<ul style="list-style-type: none"> • Law of equal rights • Law of freedom of speech • Brotherhood of man (<i>sic.</i>) • Human race as one community • Slaves are the equals of the other men (<i>sic.</i>), all human beings are equal
Seneca (1969) (first published c. 65 AD)	Without wisdom the mind is sick Wisdom is necessary for happiness The greatest good is virtue, virtue has to be learnt Wealth is not necessary for wisdom, have the essentials and what is <i>enough</i>	<ul style="list-style-type: none"> • Learning, and studying • Teaching • Knowledge sharing • Sharing moral values with the younger generation • Soul • Time
Kant (in Durant, 1954)	Wisdom is organized life	<ul style="list-style-type: none"> • Stimulus • Sensation • Perception • Conception • Science • Life
Müürsepp (2013a)	–	<ul style="list-style-type: none"> • The aim of science – knowledge or wisdom
Müürsepp (2013b)	–	<ul style="list-style-type: none"> • Wisdom economy
Stebbins (2017)	Wisdom needs heart, which involves empathy, compassion and loving and hunch, which calls upon intuition	<ul style="list-style-type: none"> • Wisdom economy (WE) • Wisdom management (WM) • Knowledge economy (KE) • Knowledge management (KM)
Maxwell (1984, 2021a and b)	Wisdom being the capacity, active endeavor and desire to realize what is of value in life for oneself and others Wisdom includes knowledge and technological know-how, but much else Wisdom connected to values and practice Wisdom has become, not a private luxury, but a public necessity	<ul style="list-style-type: none"> • The aim of education should be wisdom not just acquiring knowledge • In education, solving real life problems vs. solving science problems should be the priority • Primacy of wisdom-inquiry • Wiser world, good, civilized, enlightened a world • Wiser ways of living
Müürsepp (2021)	–	<ul style="list-style-type: none"> • Wisdom management
Psychology		
Authors	Wisdom defined as	Wisdom-related concepts
Erikson (1959)	Wisdom is gained through resolving daily crises	–
Sternberg (1990, 1998)	Wisdom builds on knowledge, cognitive skills and personality characteristics and it requires understanding of cultural context Wisdom involves forming a judgment when there are competing interests that lack resolution	<ul style="list-style-type: none"> • Personality characteristics, skills, knowledge • Cultural context

Table 1.

(continued)

Psychology Authors	Wisdom defined as	Wisdom-related concepts
Ardelt (2000)	Intellectual knowledge vs. wisdom-related knowledge	<ul style="list-style-type: none"> • Universal knowledge of wisdom • Wisdom and aging • Wisdom rather than intellectual knowledge is crucial for aging well
Baltes and Staudinger (2000)	<p>Wisdom is the ways and means of planning, managing and understanding a good life</p> <p>Wisdom is an expertise in the conduct and meaning of life</p> <p>Fluid intelligence, creativity, openness to experience, psychological-mindedness and general life experiences “orchestrate” to produce wisdom</p>	<p>Six characteristics of wisdom</p> <ul style="list-style-type: none"> • Strategies and goals involving the conduct and meaning of life • Limits of knowledge and uncertainties of the world • Excellence of judgment and advice • Knowledge with extraordinary scope, depth and balance • Search for a perfect synergy of mind and character • Balancing the good or well-being of oneself and that of others
Ardelt (2003)	Three-dimensional wisdom scale	<ul style="list-style-type: none"> • Cognitive • Reflective • Affective dimensions of wisdom
Webster (2003)	Wise individuals	<ul style="list-style-type: none"> • Factors influencing wisdom • Dimensions and qualities of wisdom • Characteristics of wise individuals • Impacts of culture, practices, experiences and age on wisdom
Ardelt (2004)	<p>There is no one general definition of wisdom</p> <p>Wisdom is an integration of cognitive, reflective and affective personality characteristics</p> <p>Wisdom cannot exist independently of individuals</p> <p>Wisdom should be reserved for wise persons rather than expert knowledge</p>	<ul style="list-style-type: none"> • Three personality dimensions of wisdom
Jeste <i>et al.</i> (2010)	Wisdom is uniquely human; a form of advanced cognitive and emotional development that is experience driven	<ul style="list-style-type: none"> • Wisdom can be learned • Wisdom increases with age • Wisdom can be measured
Bangen <i>et al.</i> (2013)	Components of wisdom	<ul style="list-style-type: none"> • Decision-making knowledge • Prosocial attitudes • Self-reflection • Acknowledgement of uncertainty • Emotional homeostasis • Tolerance • Openness • Spirituality • Sense of humour
Karami <i>et al.</i> (2020)	<p>Wisdom is dynamic balance and synthesis translated into action</p> <p>Six components of wisdom (Polyhedron Model of Wisdom)</p>	<ul style="list-style-type: none"> • KM • Altruism and moral maturity • Sound judgment and decision making • Intelligence and creative thinking • Openness and tolerance • Self-regulation

(continued)

Table 1.

Psychology Authors	Wisdom defined as	Wisdom-related concepts
Karami and Parra-Martinez (2021)	Wisdom starts with realizing what we do not know, and reflecting on our foolishness	<ul style="list-style-type: none"> • Foolish vs. wise person • Wise person actively seeks for wide-range of knowledge, capable of applying that knowledge in different situations and contexts, and capable of addressing challenging problems
Sternberg and Karami (2021)	6P framework for wisdom	<ul style="list-style-type: none"> • Purpose of wisdom • Environmental/situational Press that produce wisdom • Nature of Problems requiring wisdom • Cognitive, metacognitive, affective and conative (motivational) aspects of Persons who are wise • Psychological Processes underlying wisdom • Products of wisdom

Table 1. Source(s): Jakubik

argued that wise leaders (i.e. *phronetic* leadership) can (1) judge goodness, (2) grasp the essence, (3) create shared contexts, (4) communicate the essence, (5) exercise political power and (6) foster practical wisdom in others.

The second question is: *Will intelligent work and workers replace knowledge work and workers?* Liew (2013), in his DIKIW model, proposed that intelligence connects knowledge with wisdom. Similarly, Jakubik (2020a, p. 67) argued that “human intellect is more than knowledge, the intellectual worker is more than a knowledge worker and intellectual work is more than knowledge work”. She presented the similarities and differences between knowledge work and intellectual work, as well as between knowledge workers and intellectual workers (Table 1). Who are the wisdom workers? According to Pink (2006), a wisdom worker is a creative individual who combines cognitive and emotional skills, is a talented communicator and has the ability to engage others. This paper’s authors believe that wisdom workers are guided by wisdom, human values, morals and virtues in their actions.

The third question is: *What is WM?* Currently, there is an intense discussion in the management literature on WM (e.g. Bachmann *et al.*, 2018; Banerjee, 2014; Ekmekçi *et al.*, 2014; McKenna *et al.*, 2009; McKenna and Rooney, 2005; Müürsepp, 2021; Nonaka *et al.*, 2014; Rooney *et al.*, 2010; Solé, 2017; Stebbins, 2017). The following are the essential questions raised by Solé (2017, pp. 55–61): Is KM still alive? Is KM dead? Is there an evolution towards WM? He identifies wisdom as a higher degree of knowledge, which makes it possible to act wisely. Similar to this paper, he argued that until now, little attention has been paid to wisdom in the KM literature.

Wisdom management is approached from the human resources management perspective by McKenna and Rooney (2005). They argued that “just as knowledge management is limited by a limited theory of knowledge, it is likely that wisdom management will be weakened by a lack of knowledge about wisdom”. McKenna *et al.* (2009) and Ekmekçi *et al.* (2014) discussed wise and unwise leadership. In the management literature, WM is discussed as practical wisdom (*phronesis*) and as a wise leader. “Researchers suggest that, when considering the necessity of rational judgment, it is a requirement of having a capacity to reveal the counter-intuition, vision and humanistic skills of wisdom management” (Ekmekçi *et al.*, 2014, p. 1202). Rooney *et al.* (2010) call for more wisdom research, arguing that “*Wisdom and Management in the Knowledge Economy* explains why unwise managerial practice can happen in a world

characterized by an excess of information and knowledge” (cf. Karami and Parra-Martinez, 2021; Maxwell, 2021).

KM and WM are related according to Banerjee (2014), who stated that “contemporary literature does not cite Wisdom Management as a separate topic – it is linked with Knowledge Management as an application”. Nonaka *et al.* (2014) discussed the relationships among *techne* (i.e. skills), *episteme* (i.e. wisdom of knowledge) and *phronesis* (i.e. practical wisdom). They argue that “wisdom has begun to enjoy a revival as a subject of scholarly concern, at least in management and organization studies”. Nonaka *et al.* (2014, pp. 367–373) stated that “to be wise is to acknowledge the limits and limitations of formal knowledge and its sometimes-undesired effects, how it twists and turns the world, folding it into shadows as much as it opens up novel possibilities for consideration” and “to be wise is to be able somehow to cope with a situation that is bewildering, or uncertain in ways that allow us to come to some kind of judgment, not only about the nature of the experience but how to respond”. Nonaka *et al.* (2014) find “in wisdom a way of showing what is good, collectively, about an organization and its productive powers and argue persuasively why it is that wise leaders are able to do what is good for their companies and for society by understanding the higher moral purpose of what they do while remaining grounded in everyday detail” (p. 368).

Practical wisdom is reviewed by Bachmann *et al.* (2018) from philosophical, theological, psychological and managerial perspectives. Similar to this paper, they argued that different perspectives regarding wisdom complement one another. In their multidisciplinary review, they claim and discuss how practical wisdom has the following eight features: action-oriented, integrative, normative, sociality-linked, pluralism-related, personality-related, cultural heritage and limitation-related (Bachmann *et al.*, 2018, p. 157, Table 5). They conclude the following (p. 162):

Practical wisdom improves managerial reasoning, decision making and acting concurrently (1) integrating and balancing several, often competing interests, rationalities, emotions, challenges and contexts, (2) orientating towards normative guidance of human flourishing, (3) considering the indispensable sociality of every human being as well as (4) today’s multi-layered diversity in life and society, (5) acting appropriately and authentically in a self-aware manner, (6) rediscovering transmitted cultural and spiritual heritage, (7) being aware of the incompleteness of human existence and humble in the face of one’s own achievements and capabilities and (8) targeting always realization in practice.

The fourth question is: *Can we manage wisdom?* The mainstream KM gurus consider similar questions regarding knowledge and concluded, “It is our strong conviction that knowledge cannot be managed, only enabled” (Von Krogh *et al.*, 2000, p. 7). This paper’s authors argued that wisdom, similar to knowledge, cannot be managed, but only enabled and cultivated (cf. Bachmann *et al.*, 2018; Von Krogh *et al.*, 2000). Wisdom is a characteristic of a person that evolves throughout one’s entire life. Becoming wise (cf. Karami and Parra-Martinez, 2021; Sternberg and Karami, 2021) is a process influenced by many factors. Wisdom is enabled by other people such as family members, friends, teachers and colleagues, as well as by social, cultural, legal, political and economic contexts. While data, information and knowledge are the *sources* of social practices, managerial actions and the practices of individuals as members of communities, wisdom, conversely, is the *guiding principle* of human practices and actions. Though wisdom *per se* cannot be managed, discourses about WM are useful because they direct managers’ attention towards a better understanding of and practicing wisdom (cf. Jakubik, 2021a). Therefore, the actual term “Wisdom Management” in itself is questionable. Thus, using expressions such as “wisdom and management” or “wisdom in management” would be more appropriate.

The fifth question is: *will WM replace KM?* The findings of this exploratory paper confirmed the multidisciplinary character of KM (cf. Jashapara, 2004) and wisdom

(cf., Table 1). Since the 1990s, mainstream KM, and its theories and concepts have had several phases of development (cf. Jakubik, 2007, 2011; Serenko, 2013, 2021), which have been widely criticized (Cook and Brown, 1999; Gourlay, 2006; Jakubik, 2011; Stacey, 2004; Styhre, 2003). Styhre (2003, p. 145) even argued that “there is no such thing as ‘Knowledge Management’ using capital letters, but only a multiplicity of practices aimed at managing the organizational and individual resources that we call knowledge”. He argued that “Knowledge is entangled with power, embodiment, emotionality, representation, and can never be fully understood *per se* outside of its social relationships” (p. 148) and provocatively asked, “Can we manage this thing called knowledge?” (p. 147). The criticism, similar to this paper, calls for re-humanizing KM with a better understanding of the human factors, actions, interactions, practices of knowing and learning and the process and context of knowledge creation activities.

The absence of a common definition of wisdom may not be a problem (cf. Ardel, 2004; Sternberg and Karami, 2021). In fact, there is no common definition of knowledge either (cf. Jakubik, 2007). Wisdom is not an entity that can have a strict definition or even an explanation. It is a process, an unending quest (cf. Seneca, 1969). Advance towards wisdom presumes looking at humans as fallible creatures who are able to learn from their mistakes and correct them one after another without the hope of getting done in any time at all. While KM is about achieving growth on the basis of our intellectual capacity, WM is about maintaining balance and sustainability not only on the basis of rationality but also accounting for emotions and inspirations.

While WM will probably not replace KM in the near future, it could be the next important phase of KM. WM could also emerge as a distinct discipline in future (cf. Figure 1). This paper is a small step, with a modest contribution towards this goal. Changes require small steps and victories, but we have to move in the right direction, even if it is a long struggle. “It is better to limp along the right path than to walk strongly in the wrong direction” (St. Thomas Aquinas).

4.2 Implications

Managerial decisions, actions and practices should be guided not only by hard financial factors, but also by ethics, moral values, emotional intelligence and cultural and religious sensibilities (cf. Jakubik, 2021a). They should also be guided by thinking about the impact of one’s actions on others and nature, and by reflecting and learning from the past, in order to achieve common goals.

Education and educators play a central role in fostering knowledge as well as wisdom among individuals (cf. Jakubik, 2020b; Jakubik, 2021b; Karami *et al.*, 2020; Maxwell, 2021a). Bachmann *et al.* (2018, p. 160) asked a central question about the role of management education in cultivating wisdom: “How to foster future leaders’ capacity for practical wisdom in such a way as to pay attention not only to instrumental knowledge and abstract techniques, but also to social, cultural, moral aspects and to the students’ personal development as suggested by the conciliatory view of practical wisdom?” Management education has the ability to greatly impact how future leaders will consider social, cultural and moral aspects in their practices and decisions (Jakubik, 2020b). Management education should focus more on cultivating wise and authentic leaders (cf. Maxwell, 2021a). It would also help us to reflect on the outcomes of our earlier actions and potentially find ways in which we could build a better world for everyone by sharing knowledge and wisdom with the younger generations.

4.3 Limitations and future research directions

This exploratory paper sought to discover discussions on wisdom in selected sources in KM, philosophy and psychology. The limitation of this paper is that important sources may have been ignored unintentionally. Future researchers can explore wisdom in other roots of KM,

such as sociology, anthropology, education and management. Researchers can also address the five questions that emerged in the discussion section of this paper. For example, they could investigate the wisdom society, wisdom economy, WM, wise organisation, wise community, wise leaders, wise leadership and wisdom workers.

Declarations

Acknowledgements: Authors thank the 14th Academy of Innovation, Entrepreneurship, and Knowledge (ACIEK) Sorbonne Virtual Conference – ‘Innovation, Management and Governance for Sustainable Growth’ (14–16 June, 2021) for accepting the paper for presentation. Furthermore, authors thank for feedback received from two anonymous reviewers that helped them to improve the quality of their paper. The second author thanks for the financial support received from the Estonian Research Council grant PRG462.

Funding: There was no funding for the first author. The second author has received support from the Estonian Research Council.

Authors’ contributions: MJ (90 per cent) initiated the topic, developed the research framework, explored the literature and wrote the paper. PM contributed to the philosophy section, presented an earlier version of this paper at the 14th Academy of Innovation, Entrepreneurship and Knowledge (ACIEK) Sorbonne Virtual Conference (14–16 June, 2021), and handled the copyediting.

Conflicts of interest/Competing interests: Authors declare no conflict of interest.

References

- Allee, V. (2003), *The Future of Knowledge. Increasing Prosperity through Value Networks*, Butterworth-Heinemann, Elsevier Science, Burlington.
- Alvesson, M. and Kärreman, D. (2001), “Odd couple: making sense of the curious concept of knowledge management”, *Journal of Management Studies*, Vol. 38 No. 7, pp. 995-1018, doi: 10.1111/1467-6486.00269.
- Ardelt, M. (2000), “Intellectual versus wisdom-related knowledge: the case for a different kind of learning in the later years of life”, *Educational Gerontology*, Vol. 26 No. 8, pp. 771-789, doi: 10.1080/036012700300001421.
- Ardelt, M. (2003), “An empirical assessment of a three-dimensional wisdom scale”, *Research on Aging*, Vol. 25 No. 3, pp. 275-324, doi: 10.1177/0164027503025003004.
- Ardelt, M. (2004), “Wisdom as expert knowledge system: a critical review of a contemporary operationalization of an ancient concept”, *Human Development*, Vol. 47 No. 5, pp. 257-285, doi: 10.1159/000079154.
- Aristotle (1962), “Chapter 13: ‘psychological basis of virtue’. Nichomachean ethics”, *M. Oswald Translation, Book I*, available at: <https://www.cliffsnotes.com/literature/e/ethics/about-aristotles-ethics> (accessed 18 April 2021).
- Bachmann, C., Habisch, A. and Dierksmeier, C. (2018), “Practical wisdom: management’s no longer forgotten virtue”, *Journal of Business Ethics*, Vol. 153 No. 1, pp. 147-165, doi: 10.1007/s10551-016-3417-y.
- Baltes, P.B. and Staudinger, U.M. (2000), “Wisdom. A metaheuristic (pragmatic) to orchestrate mind and virtue toward excellence”, *American Psychologist*, Vol. 55 No. 1, pp. 122-136, doi: 10.1037//0003-066x.55.1.122.
- Banerjee, A. (2014), *Knowledge and Wisdom Management*, Google Scholar, available at: http://www.delhibusinessreview.org/v_2n2/dbrv2n2p.pdf (accessed 25 May 2021).
- Bangen, K.J., Meeks, T.W. and Jeste, D.V. (2013), “Defining and assessing wisdom: a review of the literature”, *American Journal of Geriatric Psychiatry*, Vol. 21 No. 12, pp. 1254-1266, doi: 10.1016/j.jagp.2012.11.020.

- Becerra-Fernandez, I., Gonzalez, A. and Sabherwal, R. (2004), *Knowledge Management. Challenges, Solutions, and Technologies*, Pearson Prentice Hall, Upper Saddle River.
- Bencsik, A., Jakubik, M. and Juhasz, T. (2020), "The economic consequences of trust and distrust in knowledge-intensive organizations", *Journal of Competitiveness*, Vol. 12 No. 3, pp. 28-46, doi: 10.7441/joc.2020.03.02.
- Bennet, A. and Porter, D. (2003), "Chapter 53. The force of knowledge: a case study of KM Implementation in the Department of the Navy", in Holsapple, C.W. (Ed.), *Handbook on Knowledge Management, 2 Knowledge Directions*, Springer, New York, pp. 467-487.
- Bierly, P.E., Kessler, E.H. and Christensen, E.W. (2000), "Organizational Learning, knowledge and wisdom", *Journal of Organizational Change Management*, Vol. 13 No. 6, pp. 595-618, doi: 10.1108/09534810010378605.
- Boisot, M.H. (1995), *Information Space. A Framework for Learning in Organizations, Institutions and Culture*, Routledge, New York.
- Boisot, M.H. (1999), *Knowledge Assets. Securing Competitive Advantage in the Information Economy*, first published in 1998, Oxford University Press, Oxford.
- Cook, S.D.N. and Brown, J.S. (1999), "Bridging epistemologies: the generative dance between organizational knowledge and organizational knowing", *Organization Science*, Vol. 10 No. 4, pp. 381-400, doi: 10.1287/orsc.10.4.381.
- Dalkir, K. (2011), *Knowledge Management in Theory and Practice*, 2nd ed., The MIT Press, Cambridge.
- Davenport, T.H. and Prusak, L. (2000), *Working Knowledge. How Organizations Manage what they Know*, Harvard Business School Press, Boston.
- Dittmann-Kohli, F. and Baltes, P.B. (1990), "Toward a neofunctionalist conception of adult intellectual development: wisdom as a prototypical case of intellectual growth", in Alexander, C.N. and Langer, E.J. (Eds), *Higher Stages of Human Development, Perspectives on Adult Growth*, Oxford University Press, New York, pp. 54-78.
- Dobson, J. (2010), *From a Knowledge Economy to a Wisdom Economy*, available at: <https://www.thersa.org/discover/publications-and-articles/rsa-comment/2010/03/from-a-knowledge-economy-to-a-wisdom-economy> (accessed 22 May 2021).
- Durant, W. (1954), *The Story of Philosophy. The Lives and Opinions of the Greater Philosophers. From Plato to John Dewey*, The Pocket Library, New York.
- Ekmekçi, A.K., Teraman, S.B.S. and Acar, P. (2014), "Wisdom and management: a conceptual study on wisdom management, 10th international strategic management", *Elsevier. Procedia - Social and Behavioral Sciences*, Vol. 150, pp. 1199-1204, doi: 10.1016/j.sbspro.2014.09.135, available at: <https://www.sciencedirect.com/science/article/pii/S1877042814051842> (accessed 25 May 2021).
- Erikson, E.H. (1959), *Identity and the Life-Cycle*, International Universities Press, New York.
- Flyvbjerg, B. (2001), *Making Social Science Matter. Why Social Inquiry Fails and How it Can Succeed Again* S. Sampson, (Translated by), Oxford University Press, Oxford.
- Fuller, S. (2002), *Knowledge Management Foundations*, Butterworth-Heinemann, Oxford.
- Gourlay, S. (2006), "Conceptualizing knowledge creation: a critique of Nonaka's theory", *Journal of Management Studies*, Vol. 43 No. 7, pp. 1415-1436, doi: 10.1111/j.1467-6486.2006.00637.x.
- Hislop, D. (2009), *Knowledge Management in Organizations. A Critical Introduction*, 2nd ed., Oxford University Press, Oxford.
- Holsapple, C.W. (Ed.) (2003), *Chapter 53. Handbook on Knowledge Management. 2 Knowledge Directions*, Springer, New York, pp. 467-487.
- Jakubik, M. (2007), "Exploring the knowledge landscape: four emerging views of knowledge", *Journal of Knowledge Management*, Vol. 11 No. 4, pp. 6-19, doi: 10.1108/13673270710762675.
- Jakubik, M. (2011), "Becoming to know. Shifting the knowledge creation paradigm", *Journal of Knowledge Management*, Vol. 15 No. 3, pp. 374-402, doi: 10.1108/13673271111137394.

- Jakubik, M. (2020a), "Rise of intellectual workers and intellectual work", *International Journal of Management, Knowledge and Learning*, Vol. 9 No. 1, pp. 59-73.
- Jakubik, M. (2020b), "Educating for the future—cultivating practical wisdom in education", *Journal of Systemics, Cybernetics and Informatics (JSCI)*, Vol. 18 No. 7, pp. 50-54.
- Jakubik, M. (2021a), "How can practical wisdom manifest itself in five fundamental management and leadership practices?", *Vilakshan - XIMB Journal of Management*, Vol. 18 No. 1, pp. 3-25, doi: 10.1108/XJM-08-2020-0078.
- Jakubik, M. (2021b), "Searching for practical wisdom in higher education with logos, pathos and ethos", *Case: Finnish Universities of Sciences. Philosophies*, Vol. 6 No. 3, p. 63, doi: 10.3390/philosophies6030063.
- Jashapara, A. (2004), *Knowledge Management. An Integrated Approach*, Pearson Education Limited, Harlow.
- Jennex, M.E. (2017), "Big data, the internet of things and the revised knowledge pyramid", *Data Base for Advances in Information Systems*, Vol. 48 No. 4, pp. 69-79, available at: https://www.researchgate.net/publication/320936270_Big_Data_the_Internet_of_Things_and_the_Revised_Knowledge_Pyramid (accessed 22 January 2021), doi: 10.1145/3158421.3158427.
- Jennex, M.E. and Bartczak, S.E. (2013), "A revised knowledge pyramid", *International Journal of Knowledge Management*, Vol. 9 No. 3, pp. 19-30, available at: <https://www.igi-global.com/viewtitlesample.aspx?id=99641&ptid=71564&t=A%20Revised%20Knowledge%20Pyramid> (accessed 23 January 2021).
- Jeste, D.V., Ardelt, M., Blazer, D., Kraemer, H.C., Vaillant, G. and Meeks, T.W. (2010), "Expert consensus on characteristics of wisdom: a Delphi method study", *Gerontologist*, Vol. 50 No. 5, pp. 668-680, doi: 10.1093/geront/gnq022.
- Karami, S. and Parra-Martinez, F.A. (2021), "Foolishness of COVID-19: applying the polyhedron model of wisdom to understand behaviors in a time of crisis", *Roeper Review*, Vol. 43 No. 1, pp. 42-52, doi: 10.1080/02783193.2020.1840467.
- Karami, S., Ghahremani, M., Parra-Martinez, F.A. and Gentry, M. (2020), "A polyhedron model of wisdom: a systematic review of the wisdom studies in psychology, management and leadership, and education", *Roeper Review*, Vol. 42 No. 4, pp. 241-257, doi: 10.1080/02783193.2020.1815263.
- Kunzmann, U. and Baltes, P.B. (2003), "Beyond the traditional scope of intelligence: wisdom in action", in Sternberg, R.J., Lautrey, J. and Lubart, T.I. (Eds), *Models of Intelligence, International Perspectives (Decades of Behavior)*, American Psychological Association, Washington, DC, pp. 329-343.
- Liew, C.B.A. (2013), "DIKIW: data, information, knowledge, intelligence, wisdom and their interrelationships", *Business Management Dynamics*, Vol. 10 No. 2, pp. 49-62, available at: http://www.bmdynamics.com/issue_pdf/bmd110349-%2049-62.pdf (accessed 27 May 2021).
- Lopez, S.J., Pedrotti, J.T. and Snyder, C.R. (2015), *Positive Psychology. The Science and Practical Explorations of Human Strengths*, 3rd ed., SAGE Publications, Los Angeles, pp. 224-237.
- Maxwell, N. (1984), *From Knowledge to Wisdom*, Blackwell Publishing, Oxford.
- Maxwell, N. (2021a), "How universities betrayed reason and humanity—and what's to Be done about it?", *Frontiers in Sustainability*, Vol. 2, pp. 1-11, available at: [Frontiers | How Universities Have Betrayed Reason and Humanity—And What's to Be Done About It | Sustainability](https://www.frontiersin.org/articles/10.3389/frsus.2021.631631). frontiersin.org, doi: 10.3389/frsus.2021.631631 (accessed 5 July 2021).
- Maxwell, N. (2021b), *The World Crisis—and what to Do about it: A Revolution for Thought and Action*, World Scientific Publishing Company, London.
- McKenna, B. and Rooney, D. (2005), *Wisdom Management: Tension between Theory and Practice in Practice*, available at: https://www.researchgate.net/publication/37618441_Wisdom_Management_Tensions_Between_Theory_And_Practice_In_Practice (accessed 31 May 2021).

- McKenna, B., Rooney, D. and Boal, K.B. (2009), "Wisdom principles as a meta-theoretical basis for evaluating leadership", *Leadership Quarterly*, Vol. 20 No. 2, pp. 177-190, available at: <http://kimboal.ba.ttu.edu/Selected%20writings/wisdom%20principles.pdf> (accessed 30 May 2021).
- Müürsepp, P. (2013a), "The aim of science - knowledge or wisdom", *Problemos: Filosofijos Leidinys*, Vol. 84, pp. 72-84, doi: 10.1016/j.leaqua.2009.01.013.
- Müürsepp, P. (2013b), "From knowledge to wisdom economy", *Proceedings of the Ninth International Conference on Knowledge-Based Economy and Global Management*, Tainan City: Southern Taiwan University of Science and Technology, Vols 7-8, pp. 41-49.
- Müürsepp, P. (2021), "Making sense of wisdom management", *International Journal for Applied Information Management*, Vol. 1 No. 2, pp. 63-69, doi: 10.47738/ijaim.v1i2.8.
- Nonaka, I. and Takeuchi, H. (2011), "The big idea: the wise leader", *Harvard Business Review*, available at: <https://hbr.org/2011/05/the-big-idea-the-wise-leader> (accessed 30 May 2021).
- Nonaka, I. and Toyama, R. (2002), "A firm as a dialectic being: towards a dynamic theory of a firm", *Industrial and Corporate Change*, Vol. 11 No. 5, pp. 995-1009, doi: 10.1093/icc/11.5.995.
- Nonaka, I., Toyama, R. and Hirata, T. (2008), *Managing Flow. A Process Theory of the Knowledge-Based Firm*, Palgrave MacMillan, New York.
- Nonaka, I., Chia, R., Holt, R. and Peltokorpi, V. (2014), "Wisdom, management and organization", *Management Learning*, Vol. 45 No. 4, pp. 365-376, doi: 10.1177/1350507614542901.
- Pasupathi, M. and Staudinger, U.M. (2001), "Do advanced moral reasoners also show wisdom? Linking moral reasoning and wisdom-related knowledge and judgement", *International Journal of Behavioral Development*, Vol. 25 No. 5, pp. 401-415, doi: 10.1080/016502501316934833.
- Pasupathi, M., Staudinger, U.M. and Baltes, P.B. (2001), "Seeds of wisdom: adolescents' knowledge and judgment about difficult life problems", *Developmental Psychology*, Vol. 37 No. 3, pp. 351-361, doi: 10.1037/0012-1649.37.3.351.
- Pink, D.H. (2006), *A Whole New Mind: Why Right-Brainers Will Rule the Future*, Times Bestseller, New York.
- Plato (1953), "The dialogues of Plato", in Jowett, B. (Ed.), Translated by, Laches, Modern Library, New York, p. 1, available at: <https://sacred-texts.com/cla/plato/laches.htm> (accessed 27 April 2021).
- Rooney, D., McKenna, B. and Liesch, P. (2010), *Wisdom and Management in the Knowledge Economy*, Routledge, New York, doi: 10.4324/9780203852798.
- Russell, B. (1954), *History of Western Philosophy—and its Connection with Political and Social Circumstances from the Earliest Times to the Present Day*, Readers union with. Allen Press and London, Unwin.
- Seneca, L.A. (1969), *Letters from a Stoic. Epistulae Morales Ad Lucilium*, Penguin Books, London, Selected and translated with an introduction by Robin Campbell.
- Serenko, A. (2013), "Meta-analysis of scientometric research of knowledge management: discovering the identity of the discipline", *Journal of Knowledge Management*, Vol. 17 No. 5, pp. 773-812, doi: 10.1108/JKM-05-2013-0166.
- Serenko, A. (2021), "A structured literature review of scientometric research of the knowledge management discipline: a 2021 update", *Journal of Knowledge Management*, Vols [Ahead-of-print] Nos [Ahead-of-print], doi: 10.1108/JKM-09-2020-0730.
- Serenko, A. and Bontis, N. (2017), "Global ranking of knowledge management and intellectual capital academic journals: 2017 update", *Journal of Knowledge Management*, Vol. 21 No. 3, pp. 675-692, doi: 10.1108/JKM-11-2016-0490.
- Serenko, A. and Bontis, N. (2021), "Global ranking of knowledge management and intellectual capital academic journals: a 2021 update", *Journal of Knowledge Management*, Vols [Ahead-of-print] Nos [Ahead-of-print], doi: 10.1108/JKM-11-2020-0814.
- Skyrme, D.J. (2003), *Knowledge Networking. Creating the Collaborative Enterprise*, 1st published 1999, Butterworth-Heinemann, Oxford.

- Solé, J.B. (2017), "Wisdom management, ECKM 2007-20017 review", *Proceedings of the 18th European Conference on Knowledge Management (ECKM)*, 7-8 Sep, 2017, Barcelona, Spain, Vol. 1, p. 55, available at: https://books.google.fi/books?hl=en&lr=&id=9k88DwAAQBAJ&oi=fnd&pg=PA55&dq=%22wisdom+management%22+source:%22Knowledge+Management%22&ots=slzxV9WtFB&sig=4lXUNA1WaRhG6vEhXz4A4yoFK3M&redir_esc=y#v=onepage&q&f=false (accessed 30 May 2021).
- Stacey, R.D. (2004), *Complex Responsive Processes in Organizations. Learning and Knowledge Creation*, first published in 2001, Routledge-Taylor and Francis Group, London.
- Stebbins, G. (2017), *Wisdom Economy*, [White paper], available at: https://peoplesavvy.com/wp-content/uploads/2017/04/Wisdom-Economy_WP.pdf (accessed 21 May 2021).
- Sternberg, R. (1990), *Wisdom: its Nature, Origins, and Development*, Cambridge University Press, New York.
- Sternberg, R.J. (1998), "A balance theory of wisdom", *Review of General Psychology*, Vol. 2 No. 4, pp. 347-365, doi: 10.1037/1089-2680.2.4.347.
- Sternberg, R.J. and Karami, S. (2021), "What is wisdom? A Unified 6P framework", *Review of General Psychology*, Vol. 25 No. 2, pp. 134-151, doi: 10.1177/1089268020985509.
- Styhre, A. (2003), *Understanding Knowledge Management—Critical and Postmodern Perspectives*, Liber Abstrakt Copenhagen Business School Press, Malmö.
- Sveiby, K.E. and Skuthorpe, T. (2006), *Treading Lightly. The Hidden Wisdom of the World's Oldest People*, Allen & Unwin, Australia.
- Vasconcelos, A.F. (2021), "Wisdom capital: definitions, meaning and a two-level model", *International Journal of Organizational Analysis*, Vols [Ahead-of-print] Nos [Ahead-of-print], pp. [Ahead-of-print], doi: 10.1108/IJOA-09-2020-2409.
- Von Krogh, G., Ichijo, K. and Nonaka, I. (2000), *Enabling Knowledge Creation. How to Unlock the Mystery of Tacit Knowledge and Release the Power of Innovation*, Oxford University Press, New York.
- Webster, J.D. (2003), "An exploratory analysis of a self-assessed wisdom scale", *Journal of Adult Development*, Vol. 10 No. 1, pp. 13-22, doi: 10.1023/A:1020782619051.

Further reading

- Spinoza, B. (2001), *Ethics*, Wordsworth Classics of World Literature, Hertfordshire, (Translation by W.H. White, revised by A.H. Stirling. With Introduction by Don Garrett.).

About the authors

Maria Jakubik has a PhD in Industrial Economics (Hungary, 1984) and a PhD in Management and Organization (Finland, 2011) focusing on Knowledge Management. She has more than two decades of experience in the Finnish higher education. Dr Jakubik is an active research scholar of the Ronin Institute, USA and a member of the International Council on Knowledge management, Austria. She has authored several award-winning conference papers, published research papers and case studies in academic journals. Maria Jakubik is the corresponding author and can be contacted at: maria.jakubik@ronininstitute.org

Peeter Müürsepp has his PhD from the University of Vilnius. He has been a visiting fellow at outstanding academic centres, like LSE, Helsinki Collegium for Advanced Studies, Shanghai University, Al-Farabi Kazakh National University and others. Since 2011, Dr Müürsepp is the Chairperson of the Estonian Association for the History and Philosophy of Science. In 2013, Dr Müürsepp founded the journal *Acta Baltica Historiae et Philosophiae Scientiarum* and has acted as its editor-in-chief ever since. In 2016, Peeter Müürsepp was elected as the corresponding member of the International Academy of the History of Science. His permanent affiliation is with Tallinn University of Technology.

For instructions on how to order reprints of this article, please visit our website:

www.emeraldgroupublishing.com/licensing/reprints.htm

Or contact us for further details: permissions@emeraldinsight.com

The current issue and full text archive of this journal is available on Emerald Insight at:
<https://www.emerald.com/insight/2444-8494.htm>

EJMBE
31,3

CSR communication and firms' ability to win public procurement contracts

390

Ouiam Kaddouri

Research Center, Léonard de Vinci Pôle Universitaire, Paris, France, and

Stephane Saussier

*Sorbonne Business School, Paris, France and
Blavatnik School of Government, Oxford, UK*

Received 7 June 2021
Revised 21 July 2021
3 August 2021
9 August 2021
Accepted 9 August 2021

Abstract

Purpose – This paper aims to examine the link between the corporate social responsibility (CSR) communication efforts of companies and their ability to obtain public procurement contracts.

Design/methodology/approach – The authors are exploiting a database with the number of public procurement contracts won by SBF 120 companies in France and a constructed CSR index over the period of 2007–2015. The authors provide estimates of the amount of public contracts won by those companies.

Findings – The results suggest a striking influence of CSR communication on the ability of firms to win contracts.

Research limitations/implications – This study focused on the case of the SBF 120 companies under the French regulatory system and European directives, which are different from the obligations in North American countries. Second, our constructed CSR index may be too simplistic in nature, and its application is limited only to the French context. Third, we do not have any evidence about the efficiency of well-ranked firms in our study. CSR reporting is still considered to be a form of communication, even if formal, that can contain information that does not especially reflect reality, as the scandals of several companies have shown in recent years (e.g. Volkswagen, Eiffage, Enron).

Practical implications – Companies should consider Business-to-Government (B-to-G) market when investing in CSR actions.

Originality/value – This is one of the first empirical studies measuring the impact of CSR on the ability of companies to win public contracts.

Keywords CSR communication, Public procurement, CSR index, Responsible public procurement, Asymmetric information

Paper type Research paper

1. Introduction

Government procurement represents a business where taxpayers' money is used to equip the country in infrastructure, goods and services that are of importance to society and the economy. It represents 12% of the growth domestic product (GDP) of the European Union [1] and 13% of the GDP of OECD countries, on average OECD (2013). These percentages embody momentous business opportunities for companies, both nationally and internationally, which entail several strategic decisions.

In the European context, since 2014, public procurement directives have referred to public procurement as a policy instrument to be used to achieve smart, sustainable and inclusive growth

JEL Classification — H57, L33

© Ouiam Kaddouri and Stephane Saussier. Published in *European Journal of Management and Business Economics*. Published by Emerald Publishing Limited. This article is published under the Creative Commons Attribution (CC BY 4.0) licence. Anyone may reproduce, distribute, translate and create derivative works of this article (for both commercial and non-commercial purposes), subject to full attribution to the original publication and authors. The full terms of this licence may be seen at <http://creativecommons.org/licenses/by/4.0/legalcode>

This paper forms part of a special section "Innovation, Management, and Governance for Sustainable Growth", guest edited by Alba Yela.



while ensuring the most efficient use of public funds (Directive, 2014/24/EU of the European Parliament and of the Council of 26 February 2014 on Public Procurement and Repealing Directive, 2004/18/EC, 2014). Hence, public procurers are encouraged to look after broader objectives than just low prices. In addition, Directive 2013/34/EU of the European Parliament and Council, amending Directive 2006/43/CEE with regard to companies' annual reports, financial statements and consolidated financial reports for a certain type of firm, imposes on European Union member states, including France, the obligation to request the reporting of social responsibility variables from business entities to understand the evolution of their activities, the results and status in terms of their impact on the environment, society and economy along with traditional financial variables. Firms are thus obligated to report on their CSR activities.

Furthermore, public procurement is an important constituent of demand-oriented innovation policy that enables the development of sustainable practices (Brammer and Walker, 2011; Rolfstam, 2009, Bianchi *et al.*, 2019). In this regard, governments try to ensure that companies can be held liable for their actions and initiatives through the introduction of regulation and regulatory frameworks. In fact, the government is a stakeholder in the Business-to-Government (henceforth, B-to-G) market on the demand side and private companies are the suppliers. For several years, the focus of the management field was primarily on the B-to-C and B-to-B markets (Flammer, 2018), but in reality, the B-to-G market is equally important and should be studied further. In recent years, research has focused on looking at CSR almost exclusively from the corporation's side by studying topics such as whether and how CSR practices should be evaluated or what are the best CSR strategies (Lee and Carroll, 2011; McWilliams and Siegel, 2001; Sen and Bhattacharya, 2001). Nonetheless, sustainability has recently become a major goal for both private and public entities, influencing laws, policies, processes and public procurement decisions. However, other than a few exceptions, most of the CSR literature has revolved around private entities, with little attention given to the roles and responsibilities of governments and public organizations in terms of pushing toward social responsibility and sustainability (Crane *et al.*, 2014). In the past years, researchers have focused on looking at CSR almost exclusively through the corporation's side by studying topics such as whether and how CSR practices should be evaluated or what are the best CSR strategies (McWilliams and Siegel, 2001).

To fill this research gap, this paper explores whether there exists a link between CSR efforts made by companies and their success in public procurement. To do so, the paper tackles the following research question: "Do companies with a high CSR index win more public procurement contracts?". This research question focuses on the study of the B-to-G market, taking into consideration not only companies but also governments and the impact of CSR on their decision-making. To answer our research question, we use two datasets that represent a collection of information about public procurement in France for 9 years, ranging from 2007 to 2015, and a constructed CSR index for the SBF 120 companies. The SBF 120 companies are based on the French stock market index that includes the 120 most actively traded stocks listed in Paris.

We posit that enlarging the scope of objectives followed by public procurers increases contractual complexities and, hence, transaction costs (Brown and Potoski, 2003; Brown *et al.*, 2007; Saussier and Tirole, 2020). CSR efforts made by companies are a way to reduce asymmetric information with public authorities and thus constitute a signal that secures public procurers and generates a higher level of trust (Brown *et al.*, 2007). Our empirical results show that firms' CSR rankings are positively correlated with the number of public procurement contracts they obtained. In other words, their reporting plays a momentous role in their capacity to win public contracts. In fact, our results suggest that an increase of 1% in a company's global CSR index at year $t-1$ leads to an increase in the public procurement amounts won by the company at year t by 4%–6% depending on the specifications. This result highlights that CSR efforts might convey positive results not only through B-to-B or

B-to-C markets but also through the B-to-G market. They suggest that CSR improves firms' competitiveness in the market for government procurement contracts.

We believe our paper makes several contributions to the managerial literature. First, to our knowledge, this paper is the first empirical work that scrutinizes the influence of CSR communication on companies' ability to win public procurement contracts in France. In addition, we develop an original proposition that takes into consideration not only the willingness of companies to communicate their CSR actions but also the reaction of the demand side, that is, the government, with regard to the CSR information communicated by companies in terms of attributed contracts. In addition, this paper adds to the already vast literature regarding competitive advantage and strategies (Porter and Kramer, 2006) in a new market with an unexplored stakeholder until now, which is the government as a public buyer. Moreover, this paper sheds light on the role of the government and its profile as a "customer" with an important public duty toward its citizens.

The remainder of this paper is as follows. The literature review section tackles the notion of responsible public procurement and CSR communication and discusses the role of CSR in procurement transactions. Then, the data section presents both sets of data and the construction process of the CSR index, followed by the empirical strategy and the results sections, which present the methodology and the different results. Finally, the discussion section provides a discussion of the results of the empirical study, followed by a conclusion with the research limitations and several propositions for future research endeavors.

2. Literature review and conceptual propositions

2.1 Responsible public procurement and CSR communication

Governments in Europe have started to draft and put into place socially responsible public procurement [2], while businesses, on their end, have started to implement socially responsible purchasing practices in response to government demand. Responsible public procurement takes the form of governments that include objectives to be followed by bidders during the call for bids and contract execution. These objectives that must be taken into consideration through procurement contracts during the award process may include human rights, safety, diversity, issues related to disabled workers and environmental preservation (Carter and Jennings, 2004). Public authorities, through their procurement practices, aimed at influencing the market through contracting socially responsible companies to increase their motivation to act responsibly and develop responsible management practices (European Commission, 2011). In this sense, responsible public procurement represents a transition operated by governments toward a framework of public procurement that pushes toward introducing sustainable criteria, using public procurement as a policy instrument. In addition, public procurement has a vital role in the Europe 2020 strategy, as it is considered one of the market instruments that enable sustainable and all-inclusive levels of growth with regard to the use of public funds (Edman and Nohrstedt, 2017). As an example, in France, the presence of CSR variables and implications in public procurement decisions has been introduced by a set of criteria that represent up to 10% of the criteria for selection in the procurement process, which aims to show the firm's actions in terms of CSR [3].

On the corporate side, firms' CSR strategies are conveyed through a set of CSR communication materials. Studies have discussed the concerns of transparency and trust with regard to CSR communication since CSR communication and reporting have become vital for companies (Chaudhri, 2014). The drivers for CSR communication are various and broad in scope (Hanke and Stark, 2009; Bialkova and Paske, 2020), but their main objective is common and aims to achieve and protect the firm's organizational legitimacy (Arvidsson, 2010). In this regard, a side of the existing academic literature has established the importance of effective CSR communication since it is of momentous importance for companies' social disclosure and CSR

reputation (Tata and Prasad, 2015). CSR communication in this sense acts as a means to align CSR actions to the expectations of stakeholders (Tata and Prasad, 2015), including the government, as a client. From the management perspective, the challenges of CSR communication reside in how CSR is communicated to relevant stakeholders and how their needs in terms of information are satisfied (Arvidsson, 2010). Nonetheless, CSR communication is vital because it enables audiences to be informed about a firm's intentions in terms of CSR and helps influence the expectations of its stakeholders (Tata and Prasad, 2015). For this reason, reporting in the area of CSR has become a necessity for firms to improve and maintain their relationship with their stakeholders (Hanke and Stark, 2009), especially with governments when companies deal with governmental entities as their main clients.

2.2 The role of CSR in public procurement transactions

CSR is viewed as the set of corporate actions that aim to advance and enhance stakeholder relations and, at the same time, social welfare (McBarnet *et al.*, 2009). In this sense, CSR has been established as a variable that decreases information asymmetries between organizations and the relevant stakeholders (King *et al.*, 2005). In fact, CSR has been found to show the willingness of a firm to allocate a number of resources to develop a sustainable relationship with its stakeholders (Barnett, 2007); among these stakeholders, the government constitutes an important player in its role of the "client" in the B-to-G market. Thus, there are fundamental differences between the B-to-G and B-to-C or B-to-B markets since the purchasing decisions undertaken by the government are different from the decisions made by a consumer or a private business (Flammer, 2018). Although CSR is taken into consideration by the contracting process of public authorities, the academic literature has not deeply explored its underlying components and impact. Indeed, apart from the study conducted by Flammer in 2018, there is little information about firm strategies that enable them to be competitive in the B-to-G market and obtain procurement contracts, along with the role of CSR in terms of this attribution. The existing literature mainly focuses on the effect of CSR on the competitiveness of firms in the B-to-C and B-to-B markets (Flammer, 2018).

In terms of theory, the current literature focuses on the idea that CSR actions and practices enable the decrease in information asymmetries between firms and their relevant stakeholders (King *et al.*, 2005). A firm that undertakes CSR actions and strategies signals to stakeholders the unobservable attributes that help specific companies and organizations fill institutional voids and consider society at large (Porter and Kramer, 2006). If stakeholders who value CSR place importance on unobservable attributes, they may contract at a premium with these companies that adopt CSR practices (Ramchander *et al.*, 2012; Spence, 1974). Indeed, previous studies have documented that by engaging in CSR, firms may trigger positive responses from suppliers, for instance (King *et al.*, 2005; Montiel *et al.*, 2012). In the case of public procurement, firms that engage in CSR initiatives could be more likely to be considered as being "good citizens" and thus effective business partners since they may be less inclined to engage in unethical opportunistic behaviors (Flammer, 2018) and less exposed to external stakeholder activism (Kivleniece and Quelin, 2012). Moreover, companies that act as good corporate citizens both develop sustainable relationships with their stakeholders and improve their internal processes, which can signal their commitment over the long run (Hanke and Stark, 2009). This signal can also be conveyed to investors and distinguish the firm from its competitors (Su *et al.*, 2016).

Another area of the literature posits that firms are solely driven by the strategic motive of being socially responsible, which protects them against unfavorable future regulation, thus creating a potential halo effect when deciding whether to adopt CSR or enhance existing CSR actions (Hong and Liskovich, 2015).

Overall, studies suggest that CSR communication might be viewed as a way to reduce asymmetric information and cope with transaction costs that may be high when the contract complexity is significant (Brown and Potoski, 2003; Williamson, 1985). In fact, when contracting parties cannot write an agreement that is secure enough to generate trust, they rely on signals concerning the efforts made by their partners and their good faith. Thus, we hypothesize the following:

Hypothesis. Companies with good CSR practices are more likely to obtain public procurement contracts.

3. Data

3.1 *The case of France*

To test our hypotheses, we collected data on French public procurement contracts obtained by SBF 120 companies. SBF 120 (Société des Bourses Françaises) includes the 120 most traded stocks in Paris. Indeed, the SBF 120 includes all the CAC 40 (Continuous Assisted Quotation) companies added to 80 stocks listed under Euronext Paris. The choice of the SBF 120 companies is justified by the fact that publicly traded companies are considered to be first adopters and trendsetters with regard to the different types of corporate communication (Arvidsson, 2010). In addition, publicly traded companies are subject to considerable European and French regulations with regard to both environmental aspects and CSR obligations, such as the NRE [4] law for mandatory reporting and Grenelle I and II for the environment, thus pushing them to produce at least one annual report about their CSR strategies and extra financial reports.

Specifically, the data we used for this study concerned public procurement in France over the course of 9 years, between 2007 and 2015. The data were collected by a private company called Info Pro Digital [5], a digital information and service enterprise specialized in software, databases and platform leads for professionals. Among its activities in the databases category, the company collects information about the overall call for tenders in France (more than 250K calls per year) as well as award notices for the most important contracts. By matching the two datasets, we obtained information about the amount of public procurement contracts won by SBF 120 companies over the studied period (Figure 1).

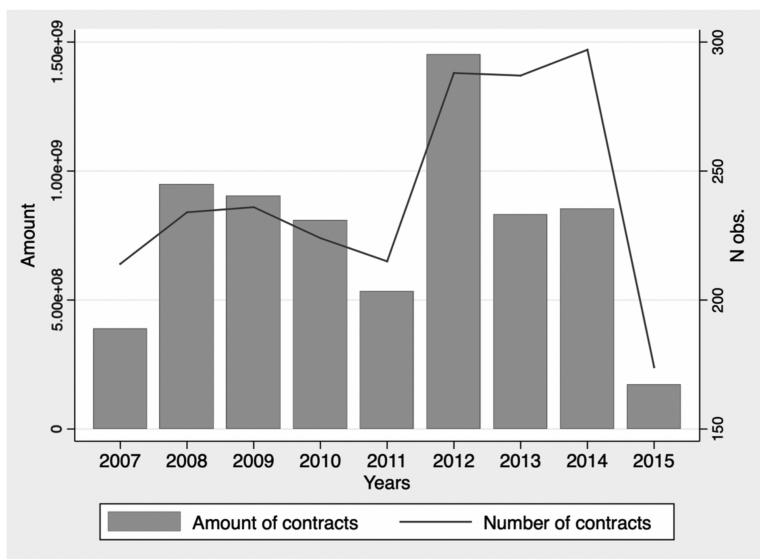
The final sample for this study consisted of 95 out of the 120 companies [6]. Those companies won, depending on the studied year, between 200 million euros and 1.5 billion euros public contracts per year, corresponding to 150–300 contracts per year with different types of public contractors (Figure 2).

3.2 *CSR index for the SBF 120 companies*

We collected data for the CSR index construction. We decided to construct our own CSR index for several reasons. First, among well-known CSR indexes (e.g. Dow Jones Sustainability Index series [DJSI], FTSE4GOOD series, KLD Global Sustainability Index Series GSI), there is a low level of convergence in their evaluation of the CSR profiles of the companies they include because their measures differ according to the industry and type of activities, which push researchers and practitioners to question their overall validity (Chatterji *et al.*, 2016). Second, France is one of the European countries with a high number of regulatory obligations regarding CSR and sustainable development in terms of corporate activities, thus placing companies in a regulatory environment different from that elsewhere. Indeed, even though CSR is a widely recognized concept, there are different national patterns of CSR that have an effect on firms' CSR adoption, practices and performance with national frameworks that impact their actions and strategies in terms of CSR (Gjølberg, 2009). Thus, creating a CSR index in relation to a regulatory framework specific to France with measures that may impact

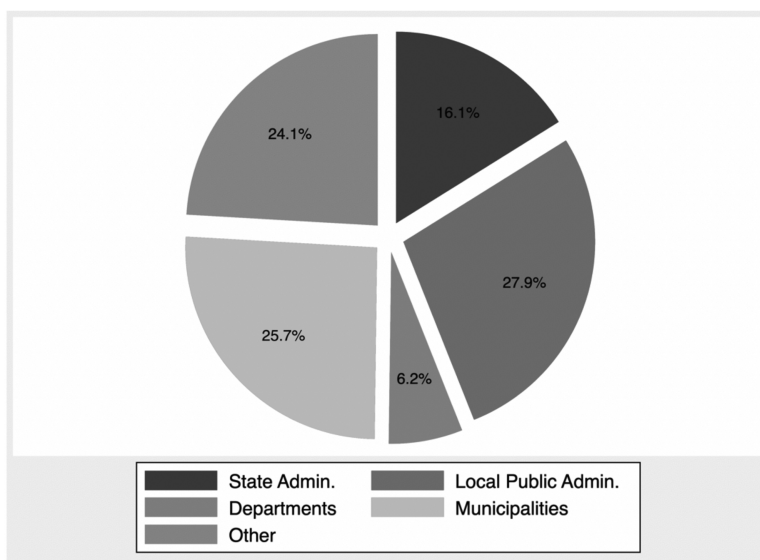
Public procurement contracts

395



Source(s): Info Pro Digital data sets and authors calculation

Figure 1. Number and amount of French public procurement contracts won by SBF 120 companies over the period 2007-2015 (limited to contracts with an amount > 10K€)



Source(s): Info Pro Digital data sets and authors calculation. **We regrouped the 36 public buyer categories in the data set into five main categories: State Administrations; Departments, Local Public Administrations; Municipalities and Others

Figure 2. French public procurement contracts won by SBF 120 companies categorized by public contractors over the period 2007-2015 (limited to contracts with an amount > 10K€)

the decision of the French public buyer seemed of added value because the unit of analysis was procurement contracts operated on the French territory with the aim of providing public services for French citizens.

To construct our CSR index, data was directly extracted from the reports of the companies that follow the NRE reporting norms set by the French government. Indeed, in their annual reports or reference documents, publicly traded companies in France publish a set of CSR indicators related to the three main aspects of CSR and sustainable development, environmental, social and economic/societal aspects, answering the criteria of the NRE law. Reporting in the context of CSR is of high importance to corporations since it allows them to boost their communication with their stakeholders and shareholders (Hanke and Stark, 2009). Additionally, publicly traded companies usually need financial resources and expertise to develop and implement formal CSR strategies, actions and reports (Panwar *et al.*, 2014). In this sense, we used CSR reports and reference documents to construct our CSR index. In fact, these reports are generated by all the SBF 120 companies on an annual basis following a set of variables imposed by the current laws, making their collection and their comparison pertinent over the length of the studied period (Albertini, 2014). Moreover, these reports are considered within the management field as proper communication means in terms of conveying companies' CSR actions and strategies (Arvidsson, 2010, Golob and Bartlett, 2007). Reports for all companies from 2007 to 2015 were collected in English with no required translation, as they are available to the public free of charge.

An example of the indicators in the reports include investments in environmental compensation actions, the evaluation of economic and territorial impact or the optimization of environmental processes indicating the multidimensional facets of CSR. Given the availability of the data for the companies in our sample, we constructed the CSR index by creating a matrix with the 57 indicators in line with the NRE law to enable us to rate the reporting of the companies and construct a rating based on whether or not they answer the overall items set by the law. In this sense, our CSR index was constructed on the basis of three main dimensions: the environmental dimension, the social dimension and the eco-societal dimension. In each block, a set of categories was developed that included several items.

First, the environmental dimension (Environmental CSR Index) with a focus on specific ecological and environmental aspects is presented in Table 1.

Second, the social dimension (Social CSR Index) focuses on aspects with regard to both internal and external stakeholders, as presented in Table 2.

The third set of our CSR index is composed of the dimensions and subdimensions linked to aspects of the potential societal and economic impact of the company's activities and strategies in regard to the communities within which it operates (Eco-Societal CSR Index). The complete set of the economic and societal dimensions and subdimensions is presented in Table 3.

For each category, a number of items represent various aspects. For each dimension and each category within the dimension, we consider a set of qualitative subindicators that take values of 0 or 1. For each subindicator, we coded (1) when the item was discussed in the reporting materials of the company and (0) when the item was not discussed in the reporting materials. Once the coding process was completed, we calculated a score for each dimension per company and per year and a final total score for each company per year. These scores represent the reporting level for each dimension and each company from 2007 until 2015. The calculation of the total score enabled us to have a general panorama of the evolution of their reporting over the studied period. The value of the CSR index may fluctuate from 0 to 57 in total, as presented in total and by category (Figure 3).

While the fluctuations show, on average, no drastic changes or extreme cases, they nonetheless show fluctuations over time within and between companies. In the following figures, we computed box plots and the distribution of our CSR variables over the studied period from 2007 to 2015. Box plots indicate the degree of dispersion (spread), and skewness

<i>Dimension 1</i>	Water, Raw Materials and Energy
<i>Sub-dimension 1.1</i>	Water resources consumption
<i>Sub-dimension 1.2</i>	Raw materials consumption
<i>Sub-dimension 1.3</i>	Energy consumption
<i>Sub-dimension 1.4</i>	Measures for energy efficiency
<i>Sub-dimension 1.5</i>	Measures for renewable energy efficiency
<i>Sub-dimension 1.6</i>	Conditions for soils usage
<i>Sub-dimension 1.7</i>	Air, water and soil discharges
<i>Dimension 2</i>	<i>Biodiversity</i>
<i>Sub-dimension 2.1</i>	Measures for biodiversity equilibrium
<i>Sub-dimension 2.2</i>	Measures for environmental preservation
<i>Sub-dimension 2.3</i>	Measures for animal species preservation
<i>Sub-dimension 2.4</i>	Measures for plant species preservation
<i>Dimension 3</i>	<i>Environmental management</i>
<i>Sub-dimension 3.1</i>	Environmental evaluation procedures
<i>Sub-dimension 3.2</i>	Environmental certification procedures
<i>Sub-dimension 3.3</i>	Measures of conformity with environmental regulations
<i>Sub-dimension 3.4</i>	Expenditure for impact prevention on the environment
<i>Sub-dimension 3.5</i>	Internal environmental management department
<i>Sub-dimension 3.6</i>	Environmental risk reduction means and methods
<i>Sub-dimension 3.7</i>	Compensation measures for pollution incidents
<i>Dimension 4</i>	<i>Respect of agreements</i>
<i>Sub-dimension 4.1</i>	Amount of provisions and risk warranties for the environment
<i>Sub-dimension 4.2</i>	Amount of indemnities after judicial decision
	Amount of compensation actions after judicial decision
<i>Dimension 5</i>	<i>Subsidiaries</i>
<i>Sub-dimension 5.1</i>	Elements on the environmental objectives assigned to subsidiaries

Table 1.
Environmental CSR
index dimensions and
sub-dimensions

indicates whether or not the data within the interquartile range (i.e. the blue box plot regroups 50% of the observations) is concentrated. Our results clearly underline that the upper and lower quartiles are less concentrated, which is well illustrated by the distributions of the CSR variables. Even though the median score of the eco-societal component of the CSR index is approximately 5 in our sample, it varies between 0 and 15, with a large fraction of our observations distributed between 1 and 11 (Figure 4).

While the median score for the environmental component of our CSR index is approximately 17 in the studied sample, it varies between 0 and 30, with a large fraction of our observations distributed between 10 and 20 (Figure 5).

While the median score of the social components of our CSR index is approximately 20 in our sample, it varies between 0 and 30, with a large fraction of our observations distributed between 12 and 28 (Figure 6).

We expect this variance to be correlated with the amount of public procurement contracts companies were able to win between 2007 and 2015.

4. Empirical strategy

4.1 Baseline estimation

To examine whether CSR affects the allocation of procurement contracts, we estimate the following OLS regressions:

$$\text{Log(Procurement)}_{i,a,t} = \alpha \text{LogCSRindex}_{i,t-1} + \beta \text{Controls}_{i,t} + \gamma_i + \eta_a + \theta_t + \epsilon_{i,a,t} \quad (1)$$

where i indexes firms; t indexes years; indexes public buyers, γ_i , η_a and θ_t are firm, public buyer and year fixed effects, respectively; *Procurement* is the euro amount of procurement contracts allocated to company i at time t by public buyer a ; and *CSRindex* is the CSR index of

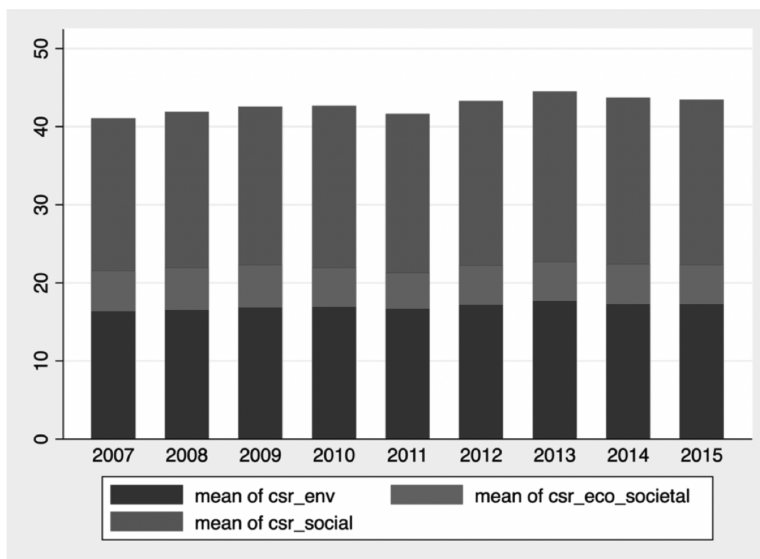
Table 2.
Social CSR index
dimensions and sub-
dimensions

<i>Dimension 1</i>	<i>Employment</i>
<i>Sub-dimension 1.1</i>	Total employees
<i>Sub-dimension 1.2</i>	Distinction between CDD & CDI
<i>Sub-dimension 1.3</i>	Recruiting difficulties/issues
<i>Sub-dimension 1.4</i>	Layoffs & layoff reasons
<i>Sub-dimension 1.5</i>	Overtime hours
<i>Sub-dimension 1.6</i>	Outside of company workers
<i>Sub-dimension 1.7</i>	Plans for employee reduction
<i>Sub-dimension 1.8</i>	Plans for job-saving
<i>Sub-dimension 1.9</i>	Efforts for staff reclassification
<i>Sub-dimension 1.10</i>	Re-hiring and follow-up measures
<i>Sub-dimension 1.11</i>	Organization of work time for full-time employees
<i>Sub-dimension 1.12</i>	Organization of work time for part-time employees
<i>Sub-dimension 1.13</i>	Salaries and their evolution
<i>Sub-dimension 1.14</i>	Social security costs
<i>Sub-dimension 1.15</i>	Incentive bonus and profit-sharing
<i>Dimension 2</i>	<i>Professional agreements</i>
<i>Sub-dimension 2.1</i>	Professional relationships
<i>Sub-dimension 2.2</i>	Summary/overview of collective agreements
<i>Dimension 3</i>	<i>Work conditions</i>
<i>Sub-dimension 3.1</i>	Absenteeism and absenteeism reasons
<i>Sub-dimension 3.2</i>	Hygiene conditions
<i>Sub-dimension 3.3</i>	Security conditions
<i>Dimension 4</i>	<i>Training</i>
<i>Sub-dimension 4.1</i>	Training programs
<i>Dimension 5</i>	<i>Equality and inclusion</i>
<i>Sub-dimension 5.1</i>	Professional equality between women and men
<i>Sub-dimension 5.2</i>	Employment and inclusion of handicapped workers

Table 3.
Eco-societal CSR index
dimensions and sub-
dimensions

<i>Dimension 1</i>	<i>Outsourcing</i>
<i>Sub-dimension 1.1</i>	Importance of outsourcing
<i>Sub-dimension 1.2</i>	Communication with outsourcing partners
<i>Sub-dimension 1.3</i>	Respect of outsourcing dispositions (& contracts)
<i>Dimension 2</i>	<i>Territorial and economic impacts</i>
<i>Sub-dimension 2.1</i>	Evaluation of the territorial impact of company's activities – employment
<i>Sub-dimension 2.2</i>	Evaluation of the territorial impact of company's activities – local development
<i>Sub-dimension 2.3</i>	Evaluation of the impact of subsidiaries' activities internationally – local development
<i>Dimension 3</i>	<i>Relationships with stakeholders</i>
<i>Sub-dimension 3.1</i>	Relationships with ONGs for social inclusion
<i>Sub-dimension 3.2</i>	Relationships with academic/educational establishments
<i>Sub-dimension 3.3</i>	Relationships with ONGs for environmental protection
<i>Sub-dimension 3.4</i>	Relationships with consumer associations
<i>Sub-dimension 3.5</i>	Relationships with local resident's associations
<i>Sub-dimension 3.6</i>	Donations

company i at year $t-1$; we also run regressions distinguishing the CSR index dimensions (i.e. eco-societal, social and environmental). This gives us four versions of our model. The coefficients of interest are α as estimated in each of our models. Due to the logarithmic specification of the dependent variable, those coefficients measure the percentage change in the value of procurement contracts corresponding to an increase in CSR indexes by 1%. By using a firm's fixed effects in our estimates, we control for a potential heterogeneity that does not vary over time between firms and that may influence firms' capacity to win public procurement contracts. However, this capacity might also be influenced by firm



Source(s): Author's calculations from the data

Figure 3. CSR Index averages (looking at three dimensions: Environment, Social and Eco-Societal) from 2007 to 2015 for SBF 120 companies. **CSR indexes are the sum of subdimensions that are present in the companies' reporting material

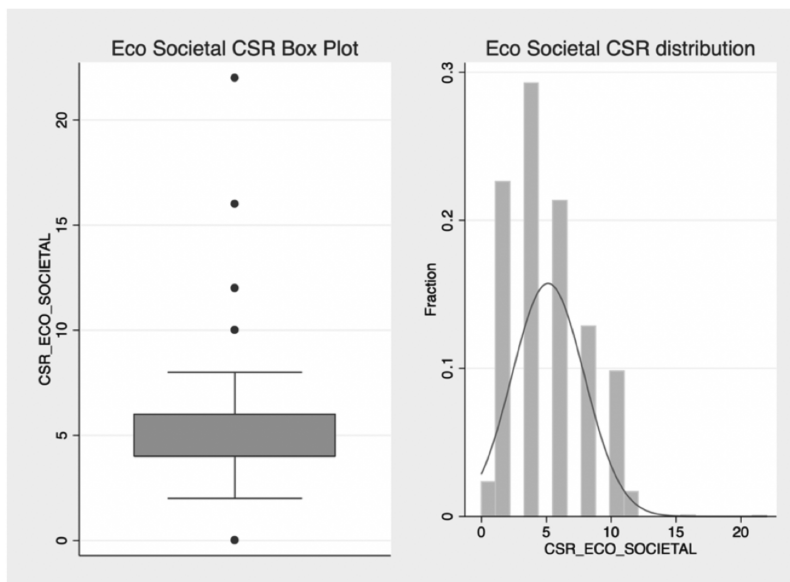


Figure 4. Box plot and distribution of Eco Societal CSR rankings

characteristics that evolve over time. To capture such heterogeneity, we created a set of control variables. First, we controlled for the evolution of firms' turnover using the variable "Turnover", which measures the firms' turnover each year in millions of euros. Second, we controlled for the amount of total assets and number of employees (Total Assets and NBEmployees). Last, we controlled for the experience of the company, coding for how long it

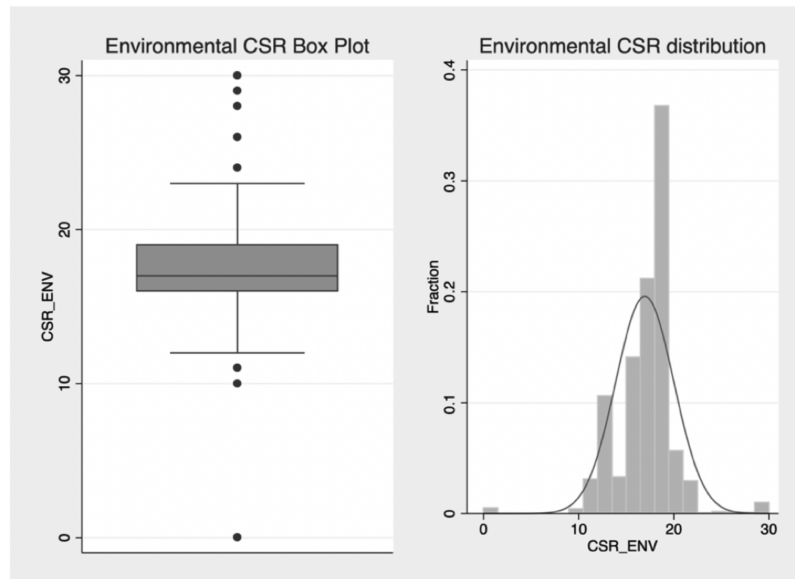


Figure 5.
Box plot and
distribution of
Environmental CSR
rankings

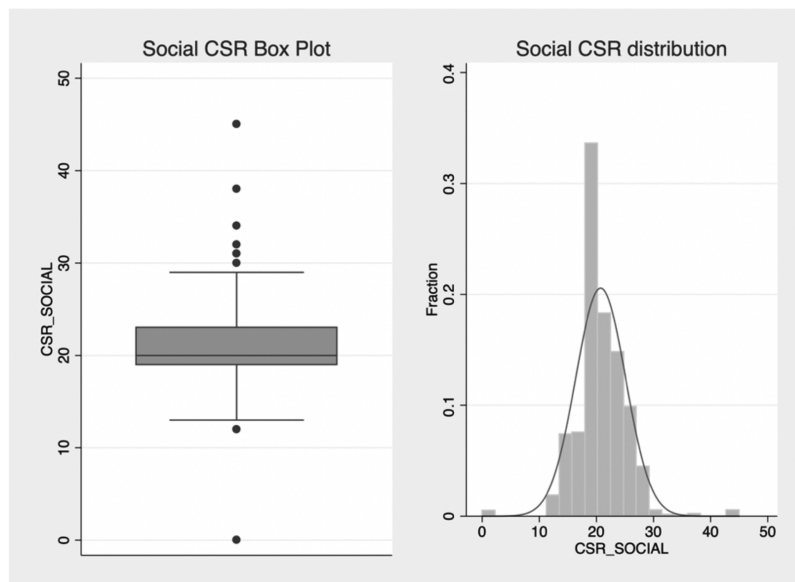


Figure 6.
Box plot and
distribution of Social
CSR rankings

has been operating (Age). By using these control variables, we expect to track the evolution of the efficiency of firms. All firms in our sample are involved in the B-to-G market with public authorities, looking for public procurement contracts and at the same time contracting with other private clients. The higher the increase in their global turnover, total asset value, number of employees and experience, the more efficient they should be in winning contracts,

in general. Hence, we expect that this variable will be positively correlated with the amount of public procurement contracts they won.

In addition, we also run models that consider the interaction between *CSRindex* and the type of involved public buyer. We thus estimate in addition of the previous one, an extended version of our baseline model:

$$\begin{aligned} \text{Log(Procurement)}_{i,a,t} = & \alpha \text{LogCSRindex}_{i,t-1} + \eta \text{LOCAL}_{a,t} + \gamma (\text{LOCAL}_{a,t} * \text{LogCSRindex}_{i,t-1}) \\ & + \beta \text{Controls}_{i,t} + \gamma_i + \eta_a + \theta_t + \epsilon_{i,a,t} \end{aligned} \quad (2)$$

We distinguished local public authorities and municipalities (i.e. municipalities, association of municipalities and regions) versus other type of buyers, such as state authorities (variable LOCAL). Our aim is to determine whether public procurers differ with their capabilities and willingness to cope with increased procurement complexity associated with following broader objectives than just prices.

4.2 Endogeneity issues

The inclusion of fixed effects for firms and public buyers limits the possibility that omitted variables that we do not observe and that are time-invariant characteristics of the firm or the public buyer may drive a spurious relationship between our CSR index and the allocation of procurement contracts. However, these fixed effects do not permit to control for unobservable time-varying firms or, more importantly, public buyer characteristics. In other words, our regressions from Eqns (1) and (2) are subject to classic reverse causality issues. In order to attend to this issue, we used the lagged value of firms' CSR indexes. To obtain a consistent estimate of α and α_γ , one would need an instrument for the CSR indexes, i.e. a variable that triggers exogenous change in the CSR index components or an exogenous shock that would permit a natural experiment of the influence of a change in CSR index components on the allocation of public procurement contracts. When such instrument is not available, the use of lagged explanatory variables is a common strategy in response to endogeneity concerns. This "lag identification" is particularly pertinent in the context of our study since it purports to alleviate threats to causal identification without requiring any other data than that available in the dataset [6].

4.3 Descriptive statistics

The descriptive statistics used are presented in Table 4.

Importantly, the switch from 1309/1285 observations to 740 observations is explained by the fact that among the 95 companies from the SBF 120 that constituted our sample and database, some companies did not archive their financial information for more than 6 or 8 years, which generated missing information with regard to our control variables. Furthermore, some companies among the 95 studied companies were created and then proceeded to an alliance or a merger after 2008, such that some information was missing for the previous years.

5. Empirical results

5.1 CSR index and the amount of public procurement contracts

The results of our baseline regressions without including control variables are presented in Table 5, and the results accounting for the control variables are presented in Table 6.

The first striking empirical result is the influence of CSR indexes on the ability to win public procurement contracts for SBF 120 companies. Our results suggest that an increase of 1% in a company's global CSR index at year $t-1$ leads to an increase of more than 4% in the public procurement amounts won by the company in year t (Column 1, Table 5). Interestingly, it seems that the social and environmental components of the CSR index are the most important ones in this respect, while the eco-societal component of the CSR index has no impact (see Columns 2–4, Tables 5 and 6). Moreover, when adding our control variables, it appears that they are not

Variable	Definition	Obs	Mean	Std. dev	Min	Max
Log-procurement	Logarithm of the won amount of public procurement	1,309	13.40458	1.990129	9.218408	20.18195
Log-TotalCSR	Lagged logarithm of the total CSR score	1,309	3.730356	0.1974393	3.332205	4.430817
Log – EcoSocCSR	Lagged logarithm of the economic and societal CSR score	1,285*	1.510449	0.543244	0.6931472	2.772589
Log Env-CSR	Lagged logarithm of the environmental CSR score	1,309	2.816905	0.1747508	2.302585	3.401197
Log social CSR	Lagged logarithm of the social CSR score	1,309	3.010819	0.1976853	2.484907	3.806663
LOCAL	Takes value 1 if the public procurer is a local authority (municipality, association of municipalities, regional authority)	1,309	0.403	0.4907596	0	1
2007	Dummy that takes value 1 if the year = 2007	1,309	0.091673	0.2886741	0	1
2008	Dummy that takes value 1 if the year = 2008	1,309	0.1352177	0.3420867	0	1
2009	Dummy that takes value 1 if the year = 2009	1,309	0.1413293	0.348494	0	1
2010	Dummy that takes value 1 if the year = 2010	1,309	0.1191749	0.3241181	0	1
2011	Dummy that takes value 1 if the year = 2011	1,309	0.1245225	0.3303029	0	1
2012	Dummy that takes value 1 if the year = 2012	1,309	0.1092437	0.3120639	0	1
2013	Dummy that takes value 1 if the year = 2013	1,309	0.1077158	0.3101396	0	1
2014	Dummy that takes value 1 if the year = 2014	1,309	0.1168831	0.3214037	0	1
2015	Dummy that takes value 1 if the year = 2015	1,309	0.052712	0.2235433	0	1
Total assets		740	58495.48	122883.5	0	840069
NBEmployees		740	112874	83034.24	0	427921
Turnover		740	31375.5	37921.03	0	251725
Age		740	70.21757	54.00629	0	346

Table 4.
Descriptive statistics

significant at all, and our qualitative results do not change with regard to the impact of CSR ranking on the ability of firms to win public procurement contracts. Additionally, an increase of 1% in a company's global CSR index at year $t-1$ leads to an increase of more than 6% in the public procurement amounts won by the company at year t (Column 1, Table 6) when the control variables are added. Our hypothesis is thus corroborated by our results.

Interestingly, none of our control variables has a significant impact on the results. It suggests that the ability of firms to increase their business in the private sphere does not impact their ability to win public procurement contracts.

5.2 The reaction of public authorities to a firm's CSR index evolution

To meticulously scrutinize the reaction of public authorities to the evolution of a firm's CSR index, we examined the influence of the CSR index given the type of public buyer. We reduced the number of categories of public buyers from 36 to 2 categories, namely, local public

	(1) OLS b/se	(2) OLS b/se	(3) OLS b/se	(4) OLS b/se
Total CSR	4.073*** (1.310)			
Eco-societal CSR		0.667 (0.601)		
Social CSR			3.442*** (1.226)	
Environmental CSR				4.247*** (1.324)
Intercept	-6.176 (4.846)	7.109*** (1.482)	-1.049 (3.637)	-2.959 (3.831)
Years F.E	Yes	Yes	Yes	Yes
Categories F.E.	Yes	Yes	Yes	Yes
Companies F.E	Yes	Yes	Yes	Yes
Interact Cat*CSR	Yes	Yes	Yes	Yes
r ²	0.355	0.341	0.354	0.358
N	1309	1289	1309	1309

Note(s): Heteroskedasticity-robust standard errors are reported in parentheses, with 36 categories of public buyers. Every CSR variable is lagged. *denotes significance at 10%, ** significance at 5%, and *** significance at 1% level

Table 5. Results from OLS Log-Log regressions from public procurement amounts of more than 10,000 €, with lagged CSR indexes, without control variables

	(1) OLS b/se	(2) OLS b/se	(3) OLS b/se	(4) OLS b/se
Eco-societal CSR	(1.879)			
Social CSR		0.202 (0.876)		
Environmental CSR			5.381*** (1.710)	
Total assets	-0.078 (0.511)	-0.148 (0.516)	0.003 (0.514)	-0.223 (0.515)
Age	-0.256 (0.464)	0.199 (0.514)	-0.241 (0.470)	-0.307 (0.441)
Turnover	0.327 (0.456)	0.314 (0.479)	0.237 (0.441)	0.224 (0.461)
NBEmployees	0.076 (0.659)	-0.019 (0.683)	-0.033 (0.646)	0.073 (0.661)
Intercept	-13.459 (10.571)	8.264 (8.271)	-5.278 (9.211)	-6.895 (9.415)
years F.E	Yes	Yes	Yes	Yes
Categories F.E.	Yes	Yes	Yes	Yes
Companies F.E	Yes	Yes	Yes	Yes
Interact Cat*CSR	Yes	Yes	Yes	Yes
r ²	0.399	0.379	0.400	0.408
N	707	687	707	707

Note(s): Heteroskedasticity-robust standard errors are reported in parentheses, with 36 categories of public buyers. Every CSR variable is lagged. *denotes significance at 10%, ** significance at 5%, and *** significance at 1% level

Table 6. Results from OLS Log-Log regressions from public procurement amounts of more than 10,000 €, with lagged CSR indexes and with control variables

authorities and municipalities (i.e. municipalities, association of municipalities and regions) versus other buyers, such as state authorities (LOCAL). As stated above, our aim is to determine the public procurers with the capabilities to cope with the increased procurement complexity that accompanies following broader objectives than just prices. In that sense, our variable LOCAL regroups the public procurers that may be more reluctant to engage in CSR objectives with their public procurement contracts because of the fear of high transaction costs. Such fear would translate into a procurement strategy that is simply to look at price/quality ratios when selecting offers.

We rerun our regressions showing the results of interacting terms (LOCAL*CSR), and the results are given in Table 7 (without control variables) and Table 8 (with control variables).

Table 7.
Results from OLS Log-Log regressions with lagged CSR indexes for two public buyer categories (local public vs state authorities) for amounts of public procurement >10,000 €, without control variables

	(1) OLS b/se	(2) OLS b/se	(3) OLS b/se	(4) OLS b/se
LOCAL	9.029*** (2.065)	1.542*** (0.339)	6.429*** (1.671)	9.087*** (1.725)
Total CSR	2.191** (0.891)			
LOCAL*Total CSR	-2.214*** (0.551)			
Eco-societal CSR		0.726** (0.346)		
LOCAL*Eco-societal CSR		-0.490** (0.208)		
Social CSR			1.328*** (0.670)	
LOCAL*Social CSR			-1.885*** (0.553)	
Environmental CSR				-1.931*** (0.950)
LOCAL*Environmental CSR				-2.961*** (0.611)
Intercept	3.281 (3.606)	10.274*** (1.490)	7.497*** (2.451)	5.993** (3.041)
years F.E	Yes	Yes	Yes	Yes
Companies F.E	Yes	Yes	Yes	Yes
r ²	0.248	0.242	0.245	0.252
N	1309	1289	1309	1309

Note(s): Heteroskedasticity-robust standard errors are reported in parentheses. LOCAL is a dummy variable indicating when the public buyer is a local public authority (i.e. municipalities, association of municipalities and regional level authorities). Every CSR variable is lagged and logged. *denotes significance at 10%, ** significance at 5%, and *** significance at 1% level

Table 8.
Results from OLS Log-Log regressions with lagged CSR indexes for two public buyer categories (local public vs state authorities) for amounts of public procurement >10,000 €, without control variables

	(1) OLS b/se	(2) OLS b/se	(3) OLS b/se	(4) OLS b/se
LOCAL	8.443*** (2.418)	1.457*** (0.475)	6.269*** (1.941)	9.466*** (2.002)
Total CSR	3.411** (1.356)			
LOCAL*Total CSR	-2.036*** (0.648)			
Eco-societal CSR		0.693 (0.437)		
LOCAL*Eco-societal CSR		-0.335 (0.286)		
Social CSR			2.185** (0.998)	
LOCAL*Social CSR			-1.798*** (0.643)	
Environmental CSR				3.184** (1.455)
LOCAL*Environmental CSR				-3.104*** (0.720)
Total assets	-0.133 (0.459)	-0.095 (0.452)	-0.091 (0.461)	-0.150 (0.460)
Age	-0.276 (0.540)	-0.027 (0.562)	-0.257 (0.550)	-0.248 (0.525)
Turnover	0.446 (0.439)	0.482 (0.443)	0.378 (0.435)	0.360 (0.440)
NBEmployees	0,053 (0.631)	-0.015 (0.635)	-0.008 (0.628)	-0.002 (0.631)
Intercept	3.821 (3.660)	10.724*** (1.490)	7.479*** (2.551)	5.998** (3.051)
years F.E	Yes	Yes	Yes	Yes
Companies F.E	Yes	Yes	Yes	Yes
r ²	0.260	0.246	0.255	0.267
N	707	687	707	707

Note(s): Heteroskedasticity-robust standard errors are reported in parentheses. LOCAL is a dummy variable indicating when the public buyer is a local public authority (i.e. municipalities, association of municipalities and regional level authorities). Every CSR variable is lagged and logged. *denotes significance at 10%, ** significance at 5%, and *** significance at 1% level

We find that while companies that increase their CSR score win more public contracts, this effect is less important when dealing with local public authorities (i.e. the interaction terms are negative regardless of the CSR index component that is being considered). Consequently, this result suggests that local authorities are less inclined to incorporate CSR objectives in their public procurement contracts. One valid explanation might be that they fear high transaction costs, as those objectives are difficult to contract on and can increase contractual difficulties.

6. Conclusion

In recent decades, CSR has clearly become the talk of the town among different stakeholders, and governments are no exception. Today, more than ever, public authorities are pressured to account for social and environmental aspects in their procurement decisions given the high impact that companies' activities and actions may have on citizens' well-being. In this regard, this study explored the existing correlation between companies with a high CSR index and public procurement contracts for 95 companies from the SBF 120 companies. The results show that, for these SBF 120 companies, given the French context, there is a positive correlation between their CSR index and their capacity to obtain public procurement contracts. This is because governments pay attention to their contracting decisions to respond to their duty in regard to citizens' well-being, especially since public procurement uses taxpayers' money. Our results highlight the ability of CSR to act as a nonmarket differentiation tool upon which managers can rely to gain further public procurement contracts by optimizing their CSR strategies and communication with different institutional stakeholders.

As is the case for any research endeavor, our study has limitations that can lead to future research questions. First, our study focused on the case of the SBF 120 companies under the French regulatory system and European directives, which are different from the obligations in North American countries, leading us to believe that the effect will not be the same from one national regulatory framework to another. Thus, future research can compare the SBF 120 companies with companies in countries with different regulatory frameworks. Second, our constructed CSR index may be too simplistic in nature, and its application is limited only to the French context since it is based on the NRE law. Hence, future studies can develop and explore other CSR indexes based on different standardized components of CSR or CSR regulatory obligations. Third, researchers can study further and in more depth the B-to-G market to understand the different dynamics generated by the existence of CSR in public procurement transactions and the variables that can impact the decision of public authorities in their choice of companies. Lastly, we do not have any evidence about the efficiency of well-ranked firms in our study. CSR reporting is still considered to be a form of communication, even if formal, that can contain information that does not especially reflect reality, as the scandals of several companies have shown in recent years (e.g. Volkswagen, Eiffage, Enron). Produced rankings have proven that because of the lack of convergence of their measures, they do not portray the exact CSR profile of companies (Chatterji *et al.*, 2016). It would be therefore interesting to conduct additional studies that look at the connection between firms' CSR activities and their ability to deliver better quality for public services.

Notes

1. <http://ec.europa.eu/trade/policy/accessing-markets/public-procurement/>.
2. At the European level, responsible public procurement has long been encouraged, at least since the 2004 Directive, in which the EC encouraged the use of public procurement considering policy aspirations other than merely cost minimization.
3. <https://www.marches-publics.gouv.fr/?page=entreprise.AccueilEntreprise>.
4. For further information, see <https://www.infopro-digital.com/?lang=en>.
5. The sample is limited to 95 companies because 25 of the SBF 120 companies do not contract with the government.

6. A few conditions are necessary for this technique to be accurate, namely, that there exists (1) a serial correlation in the potentially endogenous explanatory variable and (2) no serial correlation among the unobserved sources of endogeneity (Bellemare *et al.*, 2017).

References

- Albertini, E. (2014), "A descriptive analysis of environmental disclosure: a longitudinal study of French companies", *Journal of Business Ethics*, Vol. 121 No. 2, pp. 233-254.
- Arvidsson, S. (2010), "Communication of corporate social responsibility: a study of the views of management teams in large companies", *Journal of Business Ethics*, Vol. 96 No. 3, pp. 339-354.
- Barnett, M.L. (2007), "Stakeholder influence capacity and the variability of financial returns to corporate social responsibility", *Academy of Management Review*, Vol. 32 No. 3, pp. 794-816.
- Bellemare, M.F., Masaki, T. and Pepinsky, T.B. (2017), "Lagged explanatory variables and the estimation of causal effect", *The Journal of Politics*, Vol. 79 No. 3, pp. 949-963.
- Bialkova, S. and Te Paske, S. (2020), "Campaign participation, spreading electronic word of mouth, purchase: how to optimise corporate social responsibility, CSR, effectiveness via social media?", *European Journal of Management and Business Economics*, Vol. 30 No. 1, pp. 108-126.
- Bianchi, E., Bruno, J.M. and Sarabia-Sanchez, F.J. (2019), "The impact of perceived CSR on corporate reputation and purchase intention", *European Journal of Management and Business Economic*, Vol. 28 No. 3, pp. 206-221.
- Brammer, S. and Walker, H. (2011), "Sustainable procurement in the public sector: an international comparative study", *International Journal of Operations and Production Management*, Vol. 31 No. 4, pp. 452-476.
- Brown, T.L. and Potoski, M. (2003), "Managing contract performance: a transaction costs approach", *Journal of Policy Analysis and Management*, Vol. 22 No. 2, pp. 275-297.
- Brown, Trevor, L., Matthew, P. and Van Slyke, D.M. (2007), "Trust and contract completeness in the public sector", *Local Government Studies*, Vol. 33 No. 4, pp. 607-623.
- Carter, C.R. and Jennings, M.M. (2004), "The role of purchasing in corporate social responsibility: a structural equation analysis", *Journal of Business Logistics*, Vol. 25 No. 1, pp. 145-186.
- Chatterji, A.K., Durand, R., Levine, D.I. and Touboul, S. (2016), "Do ratings of firms converge? Implications for managers, investors and strategy researchers", *Strategic Management Journal*, Vol. 37 No. 8, pp. 1597-1614.
- Chaudhri, V. (2014), "Corporate social responsibility and the communication imperative: perspectives from CSR managers", *International Journal of Business Communication*, Vol. 53 No. 4, pp. 419-442.
- Crane, A., Guido, P., Spence, L.J. and Matten, D. (2014), "Contesting the value of 'creating shared value'", *California Management Review*, Vol. 56 No. 2, pp. 130-153.
- Edman, Å. and Peter, N. (2017), "Sweden", *European Procurement and Public Private Partnership Law Review*, Vol. 12 No. 3, pp. 352-357.
- European Commission (2011), *EU Procurement Legislation: Delivering Results*, Commission of the European Communities, Brussels, Belgium.
- Flammer, C. (2018), "Competing for government procurement contracts: the role of corporate social responsibility", *Strategic Management Journal*, Vol. 39 No. 5, pp. 1299-1324.
- Gjølberg, M. (2009), "Measuring the immeasurable?: constructing an index of CSR practices and CSR performance in 20 countries", *Scandinavian Journal of Management*, Vol. 25 No. 1, pp. 10-22.
- Golob, U. and Bartlett, J.L. (2007), "Communicating about corporate social responsibility: a comparative study of CSR reporting in Australia and Slovenia", *Public Relations Review*, Vol. 33 No. 1, pp. 1-9.
- Hanke, T. and Stark, W. (2009), "Strategy development: conceptual framework on corporate social responsibility", *Journal of Business Ethics*, Vol. 85 No. 3, pp. 507-516.
- Hong, H. and Liskovich, I. (2015), "Crime, punishment and the halo effect of corporate social responsibility", *National Bureau of Economic Research*.

- King, A.A., Lenox, M.J. and Terlaak, A. (2005), "The strategic use of decentralized institutions: exploring certification with the ISO 14001 management standard", *Academy of Management Journal*, Vol. 48 No. 6, pp. 1091-1106.
- Kivleniece, I. and Quelin, B.V. (2012), "Creating and capturing value in public-private ties: a private actor's perspective", *Academy of Management Review*, Vol. 37 No. 2, pp. 272-299.
- Lee, S.Y. and Carroll, C.E. (2011), "The emergence, variation, and evolution of corporate social responsibility in the public sphere, 1980–2004: the exposure of firms to public debate", *Journal of Business Ethics*, Vol. 104 No. 1, pp. 115-131.
- McBarnet, D., Voiculescu, A. and Campbell, T. (2009), *The New Corporate Accountability: Corporate Social Responsibility and the Law*, Cambridge University Press, Cambridge.
- McWilliams, A. and Siegel, D. (2001), "Corporate social responsibility: a theory of the firm perspective", *Academy of Management Review*, Vol. 26 No. 1, pp. 117-127.
- Montiel, I., Husted, B.W. and Christmann, P. (2012), "Using private management standard certification to reduce information asymmetries in corrupt environments", *Journal of Strategy and Management*, Vol. 33 No. 9, pp. 1103-1113.
- OECD (2013), *Government at a Glance 2013 Government at a Glance*, OECD, Paris.
- Panwar, R., Paul, K., Nybakk, E., Hansen, E. and Thompson, D. (2014), "The legitimacy of CSR actions of publicly traded companies versus family-owned companies", *Journal of Business Ethics*, Vol. 125 No. 3, pp. 481-496.
- Porter, M.E. and Kramer, M.R. (2006), "Strategy and society: the link between competitive advantage and corporate social responsibility", *Harvard Business Review*, Vol. 23 No. 5, pp. 78-92.
- Ramchander, S., Schwebach, R.G. and Kim, S. (2012), "The informational relevance of corporate social responsibility: evidence from DS400 index reconstitutions", *Strategic Management Journal*, Vol. 33 No. 3, pp. 303-314.
- Rolfstam, M. (2009), "Public procurement as an innovation policy tool: the role of institutions", *Science and Public Policy*, Vol. 36 No. 5, pp. 349-360.
- Saussier, S. and Jean, T. (2020), "Strengthening the efficiency of public procurement", *Economia Industrial*, Vol. 1 No. 415, pp. 111-123.
- Sen, S. and Bhattacharya, C.B. (2001), "Does doing good always lead to doing better? Consumer reactions to corporate social responsibility", *Journal of Marketing Research*, Vol. 38 No. 2, pp. 225-243.
- Spence, M. (1974), "Competitive and optimal responses to signals: an analysis of efficiency and distribution", *Journal of Economic Theory*, Vol. 7 No. 3, pp. 296-332.
- Su, W., Peng, M.W., Tan, W. and Cheung, Y.L. (2016), "The signaling effect of corporate social responsibility in emerging economies", *Journal of Business Ethics*, Vol. 134 No. 3, pp. 479-491.
- Tata, J. and Prasad, S. (2015), "CSR communication: an impression management perspective", *Journal of Business Ethics*, Vol. 132 No. 4, pp. 765-778.
- Williamson, O.E. (1985), *The Economic Institutions of Capitalism*, Free Press, New York, NY.

Corresponding author

Stephane Saussier can be contacted at: saussier@univ-paris1.fr

For instructions on how to order reprints of this article, please visit our website:

www.emeraldgroupublishing.com/licensing/reprints.htm

Or contact us for further details: permissions@emeraldinsight.com

