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Operational risk management and customer complaints

The role of product complexity as a moderator

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Abstract

Purpose – The purpose of this paper is to examine the relationship between operational risk management and customer complaints. It also determines whether product complexity moderates the relationship between the operational risk management and customer complaints.

Design/methodology/approach – This study utilizes a quantitative method: quantitative data were collected using a questionnaire. The population of this study is 1,845 local conventional bank branches based in Malaysia.

Findings – The findings revealed that components of operational risk management, namely practice of hazard identification and formulation of implementation of risk control, have negative and significant relationships with customer complaints. Empirical evidence confirmed the moderating effects of product complexity on the relationship between operational risk management and customer complaints.

Originality/value – From the perspective of developing countries, the main contribution of this study is the elucidation of the effect of operational risk management on customer complaints in commercial banks in Malaysia. This study confirmed the usability of the resource-based view theory in the banking industry, as well as operational risk management as a bank resource.

Keywords Product complexity, Customer complaints, Operational risk management

Paper type Research paper

1. Introduction

Customer complaints are a daily critical issue faced by banks. It is also one of the performance indicators in commercial banks, besides customer satisfaction and the number of new customers and appreciation letters (Rahim *et al.*, 2018; Tlig and Hamed, 2018; Eklof *et al.*, 2017; Ali and Raza, 2017). Complaint(s) is defined as the manifestation of displeasure toward companies, with the express goal of making the service/product provider acquainted with internal attitudes and experiences having adverse effects, which is expected to subsequently prompt them to alter the criticized behaviors. It can be created verbally or via a written statement. Dissatisfied customers provide managers with an avenue to understand critical issues and take remedial action to affect improvements (Knox and Van Oest, 2014; Faed and Forbes, 2010). From the perspective of service providers, complaints are crucial to affect the sustainability of the service provider; potentially minimize the consequences of negative reactions; and help service providers sustain their respective businesses. Perceived service failures experienced by customers are a major concern for service providers due to their potential (negative) influence on service outcome(s) (Tronvoll, 2008). The management may not know that customers are dissatisfied until they defect from the banks, at which point it is too late to take action (Kim *et al.*, 2019). Banks cannot afford to lose customers because the cost of getting new ones is higher, which means that banks are expected to deal with customer complaints by implementing special programs for service recovery

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(Angelova and Zekiri, 2011). It is important that banks minimize customer complaints and avoid future service failures (Stevens *et al.*, 2018).

During the period 2007–2012, there seems to be an increasing number of customer complaints received by Malaysian conventional banks, especially pertaining to products such as current accounts, saving accounts and services related to banking operations (www.bnm.gov.my). BNMTelelink reported increased customer complaints. Table I summarizes the number of complaints received due to operational risk by the Central Bank of Malaysia (BNM) during the period 2007–2012.

It can be seen in Table I that that the number of complaints increased between 2007 and 2012. In addition to BNM, the National Consumer Complaints Center of Malaysia also reported increased customer complaints pertaining to financial institutions between 2004 and 2012. The complaints involve unfair charges levied by financial institutions, credit card abuse, auto renewal of memberships, misleading information and billing disputes (Nadason, 2013). Moreover, the Association of Banks in Malaysia (ABM) reported that the number of complaints received on issues related to local conventional banking has increased since 2008 (ABM Annual Report, 2012). The complaints are mostly related to lapses in performing transaction requested by customers for their saving and current accounts (www.thestar.com.my/Business/Business-News/2013/03/25/Malaysian-banks-take-heed-of-complaints-making-huge-investments-to-improve-services.aspx).

Table II summarizes the numbers of complaints received by ABM between 2008 and 2012.

It can be seen in Table II that the number of complaints received by ABM Connect increased since it was launched by ABM on December 2008.

Product complexity can also lead to customer dissatisfaction and complaints, due to the confusion between perceptions of the products offered and available information (Cai and Chi, 2018; Istanbulluoglu *et al.*, 2017; Mocker and Ross, 2017; Shaukat, 2012; Küçükosmanoğlu and Sensoy, 2010; Heitmann *et al.*, 2007). The complexity of banking services and products with money involved in the activities alongside the effort toward maintaining competitiveness in the market has assumed the necessity of risk management as the main pillar of modern banking in institutes of monetary intermediation (Farhi and Tirole, 2017; Peters and Panayi, 2016; Moazinezhad and Vaysi, 2012). Complexity can arise

Years	Number of complaints reported by BNM
2007	42,720
2008	75,840
2009	253,801
2010	293,388
2011	320,028
2012	400,971

Sources: Adapted from www.bnm.my; BNM Annual Report

Table I. Summary of number of complaints received by BNM

Years	Number of complaints reported by ABM
2008	180
2009	2,000
2010	3,000
2011	4,700
2012	7,800

Sources: Adapted from www.abm.my; ABM Annual Report

Table II. Summary of number of complaints received by ABM

from the diversity and multiplicity of components in services offered, as well as the diversity and variability of performed activities (Zou *et al.*, 2018). Thus, higher product complexity results in increased customer complaints (Russo *et al.*, 2016; Shaukat, 2012). According to IBBM (2010), current accounts are more complex relative to saving accounts in the context of procedures, documentations and requirements (account opening, account maintenance, conducts of account and account updates). The negative impacts of product complexity on most of the performance measurement are common across industries. Before an organization invests in a variety-enabling strategy in operations, it could test different levels of product complexity and observe changes in the operational key performance indicators. When adding product variety, firms should also consider adding product variants that are similar to existing products, which imposes a lower cost on the production and distribution systems (Trattner *et al.*, 2019). Hence, sound operational risk management is a reflection of the effectiveness of the board and senior management in administering its products, activities, processes and systems (Pattanayak *et al.*, 2019). In line with this, the Basel Committee desires to promote and enhance the effectiveness of operational risk management throughout the banking system (Basel Committee on Banking Supervision, 2011). Besides, Dubey and Gunasekaran (2015) also suggested to include the moderating effect of product complexity in sectors with many product varieties, which include banks.

Banks face various risks in their quest of providing excellent financial services (Rahim *et al.*, 2018). Thus, the risks integral to banks' major business activities can be eliminated/mitigated by adopting proper business practices (Supriadi and Pheng, 2018; Jones *et al.*, 2018; Xu *et al.*, 2017; Svatá and Fleischmann, 2011; IBBM, 2010). Operational risk is known as unexpected risk faced by banks and has now been specifically defined by regulators and recognized by banks to be important in designing their respective risk profiles (Mizgier and Wimmer, 2018; Leone *et al.*, 2018; Yang *et al.*, 2017; Ames *et al.*, 2015; Bodla and Verma, 2008). Operational risk can be defined as the risk resulting from the shortcomings in information and internal control systems, or from external events such as frauds, which result in unanticipated losses, the risk related to either human errors, system failures and inefficient procedures that occur due to breakdown in internal control procedures, either in the front, middle or back office activities, leading to unanticipated losses (Peña *et al.*, 2018; IBBM, 2010).

This perception has led to increased emphasis on the importance of sound operational risk management in banks and financial institutions (Benoit *et al.*, 2017; Hall *et al.*, 2015). Operational risk management is a framework that can detect the most critical operational risks to organizations in a timely manner and effectively report them to all required individuals at different levels of management for them to implement the necessary actions (Tandon and Mehra, 2017; Mishra *et al.*, 2016; Tarantino and Cernauskas, 2009; Aung, 2008). Thus, operational risk can also be regarded as the weakness of financial institutions that can be reduced/eliminated via better management (Nicoletta and Cornelia, 2007). The absence of proper operational risk management will lead to disaster, and eventually the collapse of a bank (Ford and Sundmacher, 2007). Greater efforts were made toward increasing clarity across organizations on risk events that impact banks' reputation and performance (Rehman *et al.*, 2018; Gatzert and Schmit, 2016; Gatzert *et al.*, 2016). Hence, the operational risk management framework was designed to provide greater clarity in managing specific types of risk (Handa and Garg, 2018; Hopkin, 2018; Pritchard and PMP, 2014; Van Greuning and Brajovic-Bratanovic, 2009). It would enable banks to develop a more systematic approach toward understanding the nature of specific operational risk event and direct resources to address root causes (Hopkin, 2018; Bessis, 2015).

One of the outcomes of inefficiency in operational risk management is customer complaints (Hamzah *et al.*, 2017; Rahim *et al.*, 2015; Hickson *et al.*, 2002). Complaints received from the customers can expose banks to operational risks (Birindelli and Ferretti, 2017;

Nicolas and May, 2017; IBBM, 2010). Apart from offering excellent and attractive banking products, good customer service has become a key indicator in bank performance and in differentiating banks in the market (Kant and Jaiswal, 2017; Alexiadou *et al.*, 2017; IBBM, 2010). Managing customer service and customer complaints are crucial for organizations seeking long-term relationships with customers, especially banks (Syed and Jain, 2017; Bell and Luddington, 2006), due to their serious impact on banks' performance and reputation in the long run (Tjahjono, 2017; Duygun and Menteş, 2015; Duygun *et al.*, 2014). Thus, banks emphasize risk management, especially errors related to execution delivery and process management (Leone *et al.*, 2018; Knežević, 2013). According to the Basel Committee on Banking Supervision the Joint Forum (2003), execution delivery and process management are defined as losses from failed transaction processing or process management and involve no act aimed at benefiting or causing a loss for any party. It includes data entry error, system errors in transaction process, ineffective documentation of processes, failure to provide accurate external reporting, failure to ensure effective contract documents, inaccurate customer records, incomplete mandatory reporting and poor management decisions or oversight (Girling, 2013).

There are many types of complaints received with regard to services given by bank tellers. This includes error in posting transactions; unauthorized withdrawals from customers or company accounts; careless implementation of transactions (e.g. withdrawal from fixed deposit accounts prior to its maturity date); lack of understanding in closing accounts (saving and current accounts); carelessness in opening accounts; and carelessness in approving withdrawals (Rahim *et al.*, 2015; IBBM, 2010). The front liners, especially tellers, are prone to risk due to operational errors taking place while performing banking transaction for customers, which will incur higher costs toward reducing the subsequent negative effects (Rahim *et al.*, 2017; Dima, 2009). Increasing customer complaints indicate the possibility of systemic mistakes occurring and errors of judgment being made by the management of the banks (Kelliher *et al.*, 2017; Andersen *et al.*, 2016; Davies *et al.*, 2006). Therefore, this study examines the relationship between operational risk management and customer complaints. It also intends to determine whether product complexity moderates the relationship between operational risk management and customer complaints.

2. Operational risk management

Banks with higher levels of operational risk could potentially incur high levels of operating losses. Due to higher operational risk having the potential of creating losses, regulators have been forcing the banking industry to improve their respective operations (Ko *et al.*, 2019). Operational risk management encompasses the mechanisms, tools, policies, procedures and processes, including management oversight, to identify, assess, monitor, report and control operational risks (Giannone, 2018). Taking into consideration the losses suffered in the previous years, financial institutions prioritized operational risk management to obtain higher capital profitability, better capital allocation, the avoidance of unanticipated losses, the avoidance of a big number of losses of small value, the improvement of the operational efficiency, increased attention for the operational risk during the banking management process, increase service quality for the clients and strive for efficient information and human resources management (Stulz, 2015; Nicoletta and Cornelia, 2007). Risk management activities in the banking sector guarantee that capital allocation is done in an effective and efficient manner. Risk management enables this by providing the tools and processes to determine the appropriate allocation of economic capital required to keep a bank solvent (Elliott, 2014).

Banks in Malaysia have initiated many programs to increase risk awareness and risk perspective at all levels to instill understanding of the expected consequences of taking

unidentified risks and establish a personal ownership as a risk culture, while also increasing performance levels with keen risk awareness (IBBM, 2010). It is mandatory for Malaysian banks to possess all the relevant processes for the identification and evaluation of internal and external factors of operational risks. This is to ensure that the banks are able to determine the root cause of an operational risk event (Bank Negara Malaysia, 2016).

Namazian and Eslami (2011) stated that there are six dimensions in managing operational risk, as described below.

2.1 Dimension 1: hazard identification

A hazard is defined as any real or potential condition that can cause degradation, injury, illness, death or damage to or loss of equipment or property. Experience, common sense and specific analytical tools could help identify risks (Paligorova and Santos, 2017; Sweeting, 2017; Namazian and Eslami, 2011).

2.2 Dimension 2: risk analysis

This step is the application of quantitative and qualitative measures to determine the level of risk associated with specific hazards. This process defines the probability and severity of an accident that could result from the hazards based upon the exposure of humans/assets to the hazards (Teberga *et al.*, 2018; Trendowski and Rustambekov, 2017; Namazian and Eslami, 2011).

2.3 Dimension 3: analyze risk control measures

Investigate specific strategies and tools that reduce, mitigate or eliminate risks. Risks are made up of three components: probability of occurrence, severity of the hazard and exposure of people and equipment to risks. Effective control measures reduce/eliminate at least one of these factors. The analysis must consider the overall costs and benefits of remedial actions, and provide alternative choices if at all possible (Sheedy and Griffin, 2018; Ashraf, 2017; Namazian and Eslami, 2011).

2.4 Dimension 4: control decisions

Identify the appropriate decision-maker. That decision-maker must select the best control or combination of controls based on the analysis outlined in Step 3 (Eastburn and Sharland, 2017; Namazian and Eslami, 2011).

2.5 Dimension 5: implementation of risk controls

The management must formulate a plan for applying controls that have been selected, then provide the time, materials and personnel needed to put these measures in place (Hopkin, 2018; Chornous and Ursulenko, 2013; Namazian and Eslami, 2011).

2.6 Dimension 6: supervision

Once the controls are in place, the process must be periodically re-evaluated to ensure their effectiveness. Workers and managers at every level must fulfill their respective roles to assure that controls are maintained over time. The risk management process continues throughout the life cycle of the system, mission or activity (Carretta and Schwizer, 2017; Namazian and Eslami, 2011).

The efficient management of operational risks has become crucial, especially in times of crises and financial turmoil (Zakaria, 2017; Dardac and Chiriac, 2010). Operational risk need to be managed due to changes in the business environment, infrastructure and new organizational structure, intense competition, increased in automated technologies and e-commerce, increased complexity of products due to globalization, increased

decentralization, changes in the banking system via mergers, acquisitions and consolidations and increased activity of retail trade (Dubey *et al.*, 2017; Eckstein *et al.*, 2015). These factors have led to a more careful management of operational risk *vis-à-vis* the assessment and allocation of capital (Teece *et al.*, 2016; Walker, 2015; Radović-Marković *et al.*, 2014; Ana-Cornelia, 2012). If operational risk is poorly managed, organizations will incur a high cost, resulting in reduced customers' trust, brand equity and the possibility of expensive lawsuits (Muermann and Oktem, 2002). Human activities could lead to error; the more complex an activity, the higher the risk. As a result of this, the risk of damage due to mistakes varies; the spectrum includes cases such as incorrect processing due to insufficient expertise, clerical mistakes, wrong inputs into the IT systems and omissions/errors due to work-related factors. Contrary to criminal acts, these mistakes do not involve any intent for personal gain or cause damage to the employers/third parties (Oesterreichische Nationalbank, 2007). Flores *et al.* (2006) analyzed the capacity of response of the banking sector's information systems in light of the new requirements of Basel II (Basel Bank for International Settlements) on the measurement and control of operational risks. There is still a considerable distance between the current information systems in use and operational risks – information systems are compatible with the model proposed under Basel II for specific types of entities, indicating the opportunities and incentives that would arise in an attempt to close this gap.

According to Abu Hassan and Abdul Aziz (2008), the downfall of a big bank is generally caused by a poor risk management system, which is the case in point with Barrings Bank and Socgen. Therefore, banks are expected to be more observant. Reim *et al.* (2016) proposed a product-service systems risk management decision-making framework for product-service systems operation, which enables global manufacturing companies to offer product-service systems. The study identified and proposed an interconnection between the operational risks associated with providing product-service systems, possible risk management responses and decision criteria, all of which enable the decision makers to select an appropriate risk management response. Perlekar and Thakkar (2018) outlined the three criteria that can seriously affect outsourcing, which are material shortage risk, quality risk and on-time delivery risk. The study employs an integrated framework, which are "Grey Theory, Failure Mode and Effect Analysis (FMEA) and Risk Management Matrices" for a comprehensive risk management in the defense sector.

3. Customer complaints

Customers' confidence toward a bank is determined by service quality components such as the employee–customer relationship, as well as other qualities such as convenience and service-specific factors (e.g. competitive interest rates) (Ali *et al.*, 2014). Managers should probably consider the value/contribution to customer satisfaction of each dimension of the total service offering, and allocate resources accordingly. When it comes to customer complaints, managers should attempt to "get things right the first time." When a customer lodges a complain, satisfactory problem recovery will maintain satisfaction; however, switching intentions would inevitably increase. Unsatisfactory problem recovery leads to dramatic decrease in customer satisfaction and increased switching intentions. Improving customer satisfaction, and thereby retention rates, can come from a variety of activities available to the firm (Ahmed *et al.*, 2001). Oly Ndubisi and Yin Ling (2006) stated that managers should understand that no complains is not a good measure of customer satisfaction because dissatisfied customers might not complain directly to them. Dissatisfied customers might choose to complain to friends and family instead. Thus, the management may not know that customers are dissatisfied until they defect from the bank, at which point it is too late for remedial action. Furthermore, Oly Ndubisi and Yin Ling (2006) suggested that managers should recognize the seriousness of negative word-of-mouth on the

banks' reputation. The result showed that customers are more likely to complain discreetly to friends and relatives. In this case, potential customers could be influenced, and they too may develop a negative perception of the banks' services. Donoghue and de Klerk (2006) concluded that it is essential for retailers and manufacturers to understand how consumers understand and clarify unexpected negative outcomes, such as product failures. Wali and Nwokah (2017) revealed that the following emerging themes: tripartite collaboration, customer focus, customer sensitization and solicitation of customer experience feedback – are key for winning customers' trust and enhancing customer satisfaction while presenting opportunities for effective market competition.

According to Goodman-Delahunty (2001), customers often feels threatened by new technology and by the fact that acquiring information about options/comparative features of a product will be more complicated. In many situations, they are made to feel less significant, or not at all important to a bank. There are certain types of recurring complaints, which require more specialized attention, such as financial problems that ensue following a marital break-up, the death of a customer or a claim of identity fraud. When these types of complains are identified, it should be referred to a specialist skilled in dealing with them. Many managers regard customers who complain in a negative light. In fact, consumer complaints can be a valuable resource *vis-à-vis* defects in products and services that can otherwise result in a loss of business or market share. Personnel should have the discretion to treat customers flexibly and differently based on the circumstances. Long-term and loyal customers should receive better treatment. It is important to take responsibility instead of passing a customer around. Showing a compassionate attitude and being apologetic can represent important interventions in risk management. Responding to customer complaints sincerely can increase customer satisfaction (Goodman-Delahunty, 2001). By and large, the payoff for customer retention is high, and a good complain response can be used to recover from an unfavorable service experience and subsequently provide a solid basis for organizational sustainability (Tronvoll, 2008). Kitapci and Taylan Dortyol (2009) tested the differences in customer complains behavior between loyal customers and new comers. Their findings indicated that even if a new comer does not complain, this does not mean that the person is satisfied, as there is a likelihood that these customers could make private complaints, which results in the spread of negative word-of-mouth. Bank managers should therefore, if possible, pay more attention to these customers.

4. Operational risk management and customer complaints

One of the non-monetary performance indicators in a bank is managing its customer complaints, due to excellence in customer service being the most important tool for sustained business growth and is part of the business life of banks and any other organizations (Gambetta *et al.*, 2015; Malyadri and Sirisha, 2012). Banks recognize the strategic significance of customer value and continuously seek innovative ways to enhance and improve customer relationships. Since customers have more choice and control, long-lasting and strong relationships with them are critical toward achieving and maintaining competitive advantages, and, as a consequence of this, earnings. However, due to the similarity of the products and services offered by banks, loyal customers are valuable, since they are likely to spend and buy more, spread positive word-of-mouth, resist competitors' offers, wait for a product to become available, and recommend their service provider to potential customers (Petruzzellis *et al.*, 2008).

Basic indicators can be used almost anywhere in the business, usually by simply adding specific contexts. A good example is customer complaints representing a risk measure that can be closely monitored by most organizations. However, the addition of contexts such as service levels (of customer facing staff) will focus the metric onto a specific business

area and potentially on product/service areas, locations and client types by providing an enhanced perspective on the exposed areas. It will take into account the number of unresolved customer complaints such as backlogs in complaints related to issues that have already occurred, but still needs to be addressed. These backlog indicators contain elements that need organizational redressal. For example, in the case of unresolved customer complaints, organizational failure to address these issues could give rise to a costly lawsuit at some point in the future, or bad publicity, leading to reduced sales (Operational Risk Sound Practice Guidance, 2010).

In other service industries, such as healthcare, reducing customer complaints has always been the main agenda. According to Hickson *et al.* (2007), expressions of patient dissatisfaction and practice are significantly related to risk management experiences in regional medical centers. They concluded that inefficiency in risk management by doctors will lead to higher patient dissatisfaction and complaints. Furthermore, according to Hickson *et al.* (2002), the identification of an association between complaint data and risk management activity offers an excellent opportunity for addressing sources of patient complaints that can lead to lawsuits.

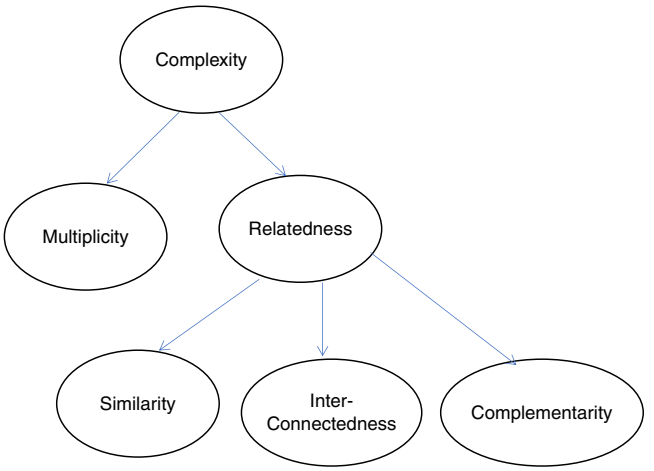
Henderson (2011) also pointed out that dentist can reduce their risk of complaints, claims or even regulatory body investigations by following risk management strategies such as proper communications and comprehending the law. Cydulka *et al.* (2011) stated that receiving complaints is a strong marker for increased risk management episodes, and should prompt early corrective action. This means that inefficiency in practicing risk management by medical emergency will lead to increased complaints and malpractice claims. Besides hospital, police departments also practice risk management in order to reduce public complaints. Macintyre *et al.* (2007) pointed out that proper risk management reduced police–citizen conflict and police misconduct, resulting in significant financial savings from reduced costs for processing complaints.

Banks that implemented risk management during 1990s were able to reduce loss volatility during the 2001 recession (Ariffin and Kassim, 2011; Drzik, 2005; Pagach and Warr, 2010; Schroeck, 2002; Nocco and Stulz, 2006). Risk management can also contribute to a lower probability of bankruptcy, risk reduction, and consequently, the sustainability of an organization (Marin, 2013). Akindele (2012) pointed out that there is a positive relationship between risk management and bank performance. He further concluded that risk management has a significant effect on bank performance and profitability. Abdul Rahim *et al.* (2018) examined the relationship between internal control system and perceived operational risk management in banks and concluded that Malaysian conventional banks possess an excellent internal control system and perceived operational risk management.

5. Product complexity as the moderator

Product complexity can be defined as the design state resulting from the multiplicity, and relatedness between product architectural elements (Jacobs, 2007). This definition is shown in Figure 1.

Jacobs (2007) stated that relatedness has three further dimensions: similarity, interconnectedness and complementarity. Similarity includes sharing characteristics such as part geometries/components, offering the same functionality, fulfilling the same strategic role in the portfolio as a prior product, or any other such indication of a similar relationship. The interconnectedness of elements includes logical interconnectedness. For example, a product that supersedes another in the portfolio, which is the familiar new and improved product, is connected to its previous version via the similarity of positions in the portfolio, functionality offered, market segment targeted or other logical connection. Complementary relatedness is intended in the economic sense, for example, an mp3 player and digital music



Source: Adapted from Jacobs (2007)

Figure 1.
Dimensions of product complexity

are complementary to each other. Closs *et al.* (2008) concluded that managers must consistently balance the requirements for sales growth via increased product complexity, which includes more features and variants against requirements for enhanced operational efficiency through product restructuring.

Orfi *et al.* (2011) pointed out that despite the lack of underlying definition of product complexity, different dimensions of complexity have been established on an application-specific basis. Orfi *et al.* (2011) provided a comprehensive list of product complexity dimensions as an important preliminary step toward establishing a unified product complexity metric. The approach has established indicators for each dimension as proxies for the costs caused by product complexity. The five main dimensions of product complexity include variety, functional index, structural index, design index and production index. The description and details of each dimension are as follows:

(1) Variety

Variety is described in terms of unique products, components and processes. Among the benefits of product variety is increased sales via greater product variants. However, increasing product variants will lead to increased costs associated with inventory, production and development, ultimately increasing complexity.

(2) Functional index

The need to meet many functional requirements can increase the product design and development cycle time, and decrease the level of flexibility and control possessed by the design engineers. The addition of new functional requirements can impact the learning curve and quality control requirements in both the product realization and production stages. The more functions the product must perform, the higher its level of perceived complexity.

(3) Structural index

Structural complexity is defined as the complexity associated with the physical character of a product. The number of components and parts in a product has generally been used to describe the complexity of the product in terms of its size; the more components to consider in a product, the greater the complexity of product design, production and supply chain.

(4) Design index

Another indicator of design complexity is the level of control over the product and the component being designed. Control over design aspects can be depicted by functions and attributes of a product; a good design is one that satisfies all specified functional requirements for the product with the minimum number of components.

(5) Production index

In production, several indicators of complexity can be identified, such as interconnectivity level being identified in other complexity dimensions. Among the important production complexity indicators are the number of trajectories or production paths available per product and its associated components; the larger the number of possible paths, the higher the level of uncertainty, which adds to the complexity of production scheduling and logistical management.

Bank product range is often rich in complex bundles, combining features associated with more diverse products. The additional complexity inherent in such product bundles is not counterweighted by the value perceived by customers, or worse, often adds to the difficulty in understanding the product and its high price (Bernasconi and Pastore, 2011). Based on Orfi *et al.* (2011) dimensions of product complexity, only three indices, which includes variety, functional and structural indices can be applied for banks' current and saving accounts' complexities. In terms of variety and structure in a current account, many local conventional banks in Malaysia offer many types of current accounts, such as interest bearings account or non-interest bearing, or hybrid current accounts, which combines the features of both current and saving accounts, while the latter has the lowest variety and structural outlook (IBBM, 2010). In terms of functional index, a current account has many requirements relative to a savings account (IBBM, 2010). The complexity for current and savings accounts are summarized in Table III.

It can be seen in Table III that current accounts have the highest level of complexity relative to saving accounts.

Previous studies found that product complexity has moderating effects, although most of them are unrelated to issues pertaining to bank performances. Dubey *et al.* (2017) examined the role of product complexity in determining the relationship between upstream supply chain visibility (resources and capability) and the social, environmental and economic dimensions of sustainable supply chain performance. Their focus on product complexity derives from the customization, intricacy and the variety of the firm products. It was found that product complexity has positive moderating effects on social performance, environmental performance and economic performance. This result indicated that product complexity is an effective moderator between supply chain visibility and sustainable supply chain performance. Besides, this result justified firms' effort in developing supply chain visibility capability as it leads to improved performance, in both complex and simple product environments. The effectiveness of supply chain visibility is clear under high product complexity as compared to under low product complexity. Supply chain visibility may assist firm in handling complex product environments, resulting in better social and environmental performance.

Table III. Level of current account and savings account complexity in relation to variety and functional indexes

	Current account complexity				Saving account complexity			
	AO	AM	COA	AU	AO	AM	COA	AU
Variety (process)	High	High	High	High	Low	Low	Low	Low
Functional (requirement)	High	High	High	High	Low	Low	Low	Low
Structural (product outlook)	High	High	High	High	Low	Low	Low	Low

Notes: AO, account opening; AM, account maintenance; COA, conduct of account; AU, account updating

Another study by Eckstein *et al.* (2015) tested the moderating effect of product complexity on the relationship between supply chain agility and adaptability on organizational performance. In their study, product complexity is measured by addressing the customization of products and value-added services, the number of product components and the offering of product variants. It was found that product complexity positively moderates the links between supply chain adaptability and cost performance, and supply chain adaptability and operational performance. The results indicated that higher the product complexity, the higher the performance effect that can be derived from increasing adaptive firm capabilities. However, when supply chain adaptability is low, low product complexity outperforms high product complexity. Thus, while supply chain adaptability is less effective under low product complexity, supply chain agility can lead to enhanced cost performance and operational performance under both low and high product complexity, making it a more universally beneficial capability. The results assist managers who face a constant trade-off between requirements for sales growth through increased product complexity (i.e. more features and variants) and requirements for enhanced operational efficiency through product rationalization. This especially pertains to managers facing markets consisting of customers who require more choice in product offerings or greater levels of customization, and who will ultimately experience greater satisfaction from increased product line breadth.

In another study, Blome *et al.* (2014) examined the influence of internal and external knowledge transfer activities on the supply chain's flexibility, with product complexity as the moderator. In their study, product complexity was measured by the customization of products and value-added services, the number of product components and the offering of product variances. They confirmed that product complexity has a moderating effect on the relationship between external knowledge transfer and supply chain flexibility. Croitoru (2011) showed that product complexity has a moderating effect on how consumers allocate attention to pioneers and late entrants.

Kuester and Buys (2009) showed the moderating effect of product complexity by pointing out that products with many attributes possess high product complexity, and that product information will be excessive. Subsequently, the probability of information overload and customer confusion is higher in purchase situations characterized by low product complexity. Furthermore, the difference between the amount of information to process in high product complexity vs low product complexity situations increases with increasing size of product line/complexity. There has been no empirical study to examine the moderating effects of product complexity between the relationship of perceived operational risk management and customer complaints in the banking industry. Blome *et al.* (2014) stated that product complexity negatively moderates the relationship between external knowledge transfer and supply chain flexibility. Um *et al.* (2017) analyzed the relationships between five constructs, namely product variety management strategy (i.e. modularity, cellular manufacturing and postponement), supply chain flexibility, supply chain agility, cost efficiency and customer service. Their findings showed that product variety improves cost efficiency and customer service via increased supply chain flexibility and agility. They confirmed that supply chain flexibility and agility, acting as dynamic capabilities, mediate the impacts of PVMSs on cost efficiency and customer service. Trattner *et al.* (2019) presents a systematic literature review of recent scholarly literature on product complexity (number, diversity and interrelatedness of product variants and components) and operational performance. Besides, their study indicated that product complexity has a consistently negative relationship with cost, time, quality and delivery performance measures, although the relationships with quality and delivery performance are less clear.

6. Theoretical framework

The theoretical framework, as per Figure 2, was developed based on previous research. In this framework, operational risk management is the independent variable, while customer complaints and product complexity are the dependent and moderating variables.

7. Methodology

This research used a set of survey instruments containing questionnaires to measure the variables in this study. Data were collected using self-administered survey questionnaires. This study was performed on local commercial banks in Malaysia. The target population of this study is 1,845 local conventional bank branches across Malaysia. The local banks are the eight anchor banks of Malaysia, which are RHB Bank Berhad, CIMB Bank Berhad, Maybank Berhad, Allianze Bank Berhad, Affin Bank Berhad, AM Bank Berhad, Hong Leong Bank Berhad and Public Bank Berhad. Since this study is in the context of Malaysia, the selected banks are regarded as suitable due to similarities in product type, internal control system, the exposure of operational risk, customer complaints, and are all governed by Bank Negara Malaysia. Table IV shows the banks and their corresponding branches, as per ABM Annual Report (2012).

Based on Table IV, Maybank Berhad has the highest number of conventional branches in Malaysia, while Allianze Bank Berhad has the lowest number of conventional branches. The statewide classification of these banks is shown in Table V, which forms the target population of this study according to ABM Annual Report (2012).

Table VI tabulates the variables, dimensions, source of the measurement items and numbers of measurement items.

8. Results

8.1 Factor analysis

Factor analysis is an important tool needed to evaluate whether the collected data are in line with the theoretically expected pattern or structure of the target construct, thereby determining if the measures used have indeed measured what they are purported to measure (Matsunaga, 2010). Confirmatory factor analysis (CFA) has been used to determine whether all of the items in each dimension falls into the dimension. CFA is a statistical technique used to verify the factor structure of a set of observed variables. This factor analysis tool allows the researcher to test the hypothesis that a relationship between observed variables and their underlying latent constructs exists. The researcher uses knowledge of the theory, empirical research, or both, and postulates the relationship pattern a priori, then statistically tests the hypotheses (Suhr, 2006). The convergent validity is used to measure whether all the question

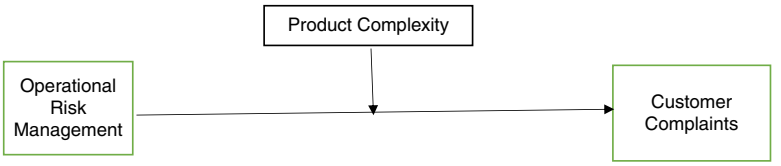


Figure 2.
Theoretical framework

No.	Local banks	Number of branches
1	Maybank Berhad	399
2	CIMB Bank Berhad	316
3	Hong Leong Bank Berhad	304
4	Public Bank Berhad	254
5	RHB Bank Berhad	190
6	AM Bank Berhad	184
7	Affin Bank Berhad	100
8	Allianze Bank Berhad	98
Total branches		1,845

Table IV.
Population of all banks

No.	State	Number of local bank branches
1	Selangor	408
2	Kuala Lumpur	291
3	Johor	230
4	Perak	161
5	Pulau Pinang	154
6	Sarawak	139
7	Sabah	107
8	Pahang	78
9	Kedah	75
10	Negeri Sembilan	64
11	Melaka	52
12	Terengganu	39
13	Kelantan	36
14	Perlis	11
Total		1,845

Table V.
Distribution of branches according to states in Malaysia

Section	Variables	Dimensions	Source	Numbers of items
A	Demographic		Self-developed	
Independent variables				
B	Operational risk management	Hazard identification	Guide to Risk Management, Queensland Government (2011)	9
		Risk analysis		7
		Analyze risk control measures		6
		Control decisions		5
		Implementation of risk controls		5
		Supervision		5
Moderating variable				
C	Product complexity		Designed based on the discussion with branch managers or assistant managers during pre-test	1
Dependent variable				
D	Customer complaints		Designed based on the discussion with branch managers or assistant managers during pre-test	9

Table VI.
Variables, dimensions, source and numbers of measurement items

items in the variables are correctly measured. This procedure is called internal validity (Mohajan, 2017). Emmerson and Grimm (1996) used CFA separately for each variable of availability, timeliness, delivery quality and communication in order to determine the convergent validity for the Mentzer, Gomes and Krapfel model.

8.2 Operational risk management

Table VII summarizes all the items remained and deleted for operational risk management after CFA.

Based on Table VII, in the case of hazard identification, after factor analysis, the result yielded two factors; documentation of hazard identification and practice of hazard identification. No items have been eliminated. Eight items had communalities of more than 0.50.

Dimension	Number of item (before factor analysis)	Number of item (after factor analysis)		Item deleted
		Hazard identification 2 dimensions		
Hazard identification	9	Documentation of hazard identification = 5 items	Practice of hazard identification = 4 items	None
Risk analysis	7	2		5
Analyze risk control measures	6	4		2
Control decision	5	5		None
		Implementation of risk controls 2 dimensions		
Implementation of risk controls	5	Formulation of implementation of risk controls = 2 items	Actual implementation of risk controls = 2 item	1
Supervise	5	5		None

Table VII. Summary of items remained and deleted for operational risk management

The eigenvalue for all of the items is 5.48, which explains 60.86 percent of the variations in the items, with loading of 0.69–0.86. Meanwhile, for the fifth step of implementation of risk control, after the factor analysis, the result yielded two factors: formulation of implementation of risk control and actual implementation of risk control. One item has been eliminated. After elimination, the remaining four items had communalities of more than 0.50. The eigenvalue for all of the items is 2.04, which explains 77.29 percent of the variations in the items, with loading of 0.85–0.89.

Based from the information collected from the survey questionnaires, the mean score was calculated for each item in operation risk management dimensions. Table VIII shows the mean of the eight dimensions of operational risk management.

From Table VIII, the risk analysis dimension is highly rated item with a mean of 4.80. The lowly rated item is the practice of hazard identification, with a mean of 4.11. In the case of all of the dimensions, all of the items stated have scores of 3.00–5.00, which are perceived to be important in the context of this study. This means that the respondents consider all of the items identified as existing in the branch implementation of operational risk management.

8.3 Product complexity

For product complexity, respondents were asked to assign weightages of savings and current accounts present in their respective branches. Based on the questionnaires, 76 percent of the respondents have more current accounts maintained at their respective branches, while 24 percent of the respondents have higher saving accounts maintained at

Items	Min.	Max.	Mean	SD	Skewness	Kurtosis
Documentation of hazard identification	3.80	5.00	4.63	0.34	−0.71	−0.59
Practice of hazard identification	3.00	5.00	4.11	0.60	−0.22	−1.00
Risk analysis	4.00	5.00	4.80	0.36	−1.49	0.56
Analyze risk control measures	3.25	5.00	4.18	0.49	0.21	−1.25
Control decision	3.90	5.00	4.60	0.28	−0.53	−0.32
Formulation of implementation of risk control	3.50	5.00	4.69	0.41	−0.91	−0.66
Actual implementation risk control	3.50	5.00	4.67	0.43	−0.87	−0.64
Supervision	4.00	5.00	4.77	0.31	−1.27	0.64
Operational risk management	3.62	5.00	4.56	0.40		

Table VIII. Means scores of the operational risk management

their branches. Therefore, branches with higher current accounts maintained are exposed to high-level product complexity, while branches with more saving accounts maintained are exposed to a lower level product complexity.

8.4 Customer complaints

In the case of customer complaints, the information collected from the survey questionnaires is summarized in Tables VI and VII. The Likert scale for customer complaints has been coded as; 1 is rated as very frequently, 2 is rated as frequently, 3 is rated as occasionally, 4 is rated as rarely, while 5 is rated as never. However, during data analyses, the Likert scale were reversed coded as; 5 is rated as very frequently, 4 is rated as frequently, 3 is rated as occasionally, 2 is rated as rarely, while 1 is rated as never. Yes and No questions were added to determine whether or not a complaint exists. If a complaint exists, respondents need to rate the degree of the complaint reported in a branch. When respondents answer "No," their answers will be removed from the analysis. Tables IX and X summarize the types and number of customer complaints received by the respective branches.

It can be seen from Table IX that in the case of current accounts, the highest number of complaints received is about bank statement not received, with 132 complaints, while the lowest is about interest rate not agreed to customer's calculation, with 4 complaints. It can be seen in Table X that in the case of saving accounts, the highest complaint received is

Table IX.
Number of current account complaints received by branches

Type of customer complaints	Number of complaints	Minimum	Maximum	Mean	SD
Unauthorized transaction (withdrawal)	107	1	3	1.36	0.52
Wrong amount deposited	121	1	4	1.41	0.63
Wrong account deposited	103	1	3	1.43	0.64
Funds do not agree to customer record	48	1	3	1.17	0.48
Interest rate does not agree with customer's calculation	4	1	1	1.00	0.000
Balance refunded does not agree with customer's calculation or record	48	1	2	1.25	0.44
Inability to withdraw money for dormant accounts	43	1	2	1.30	0.47
Bank statement is not received	132	1	4	3.09	0.55
Fees charged for account maintenance is too high? Different?	97	1	4	1.44	0.71

Table X.
Number of savings account complaints received by branches

Type of complaints	Number of complaints	Minimum	Maximum	Mean	SD
Unauthorized transaction (withdrawal)	101	1	3	1.29	0.50
Wrong amount deposited	124	1	3	1.33	0.58
Wrong account deposited	126	1	3	1.30	0.597
Funds do not agree to customer record	46	1	2	1.26	0.44
Interest rate does not agree with customer's calculation	11	1	2	1.18	0.41
Balance refunded does not agree with customer's calculation or record	47	1	2	1.23	0.43
Inability to withdraw money for dormant accounts.	33	1	3	1.79	0.74
Bank statement is not received	28	1	2	1.18	0.39
Fees charged for account maintenance is too high? Different?	0				

about wrong account deposited, with 126 complaints, while the lowest is about fees charged too high, with 0 complaints (Table XI).

In this regression analysis, customer complaint is the dependent variable. From the table, the results concluded that a model exists, and a negative and significant relationship exists between the p operational risk management and customer complaints. The *F*-test indicates that the direct model is of good fit with the data obtained. The model is statistically significant and explained 37.1 percent of the variation in customer complaints.

8.4.1 The relationship between operational risk management and customer complaints. Table XII summarizes the results of hypotheses testing on the relationship between operational risk management and customer complaints.

8.4.2 The moderating effect of product complexity on the relationship between operational risk management and customer complaints. Table XIII summarizes the results of hierarchical regression using product complexity as the moderator on the relationship between operational risk management and customer complaints.

To test the moderating effects of product complexity on the relationship between operational risk management and customer complaints, Models 2 and 3 show the result of the hierarchical regression analysis. Model 2, upon inclusion of product complexity, was analyzed. The results in Table XII indicates that the model is highly significant, with a p-value = 0.000, and the R^2 improved to 39 percent. The additional explanatory power improves the R^2 significantly. Moreover, with the inclusion of interaction variable

Model	Standardized coefficients β	Sig.
(Constant)		0.498
Documentation of hazard identification	0.148	0.220
Practice of hazard identification	−0.255	0.006***
Risk analysis	−0.134	0.108
Analyze risk control measure	0.373	0.000***
Control decision	0.178	0.120
Formulation of implementation of risk control	−0.184	0.045**
Actual implementation of risk control	0.153	0.090*
Supervision	0.059	0.542
R^2	0.371	
Adjusted R^2	0.326	
F-test	8.258	
Significant	0.000***	
n	132	

Notes: *$p < 0.10$; **$p < 0.05$; ***$p < 0.01$

Table XI. Regression analysis between operational risk management dimensions and customer complaints

Operational risk management	Customer complaints
Documentation of hazard identification	
Practice of hazard identification	Significant (negative)
Risk analysis	
Analyze risk control measure	Significant (positive)
Control decision	
Formulation of implementation of risk control	Significant (negative)
Actual implementation of risk control	Significant (positive)
Supervise	

Table XII. The relationship between operational risk management and customer complaints

Variables	Customer complaints Model 1 Standardized β	Model 2 Standardized β	Model 3 Standardized β
Independent variable			
Documentation of hazard identification	0.136	0.113	0.135
Practice of hazard identification	*−0.265***	*−0.254****	−0.061
Risk analysis	−0.116	−0.099	−0.231
Analyze risk control measure (against)	0.365***	0.344***	0.143
Control decision	0.185	0.170	0.260
Formulation of implementation risk control	−0.186**	−0.181**	−0.043
Actual implementation risk control (against)	*0.149**	*0.201***	0.166
Supervision	0.057	0.024	−0.044
Moderator variable			
Product complexity (PC)		0.156*	0.159*
Interaction effect			
Documentation of hazard identification×PC			−0.140
Practice of hazard identification×PC			−0.169
Risk analysis×PC			0.171
Analyze risk control measure×PC			0.292*
Control decision×PC			−0.125
Formulation of implementation of risk control×PC			−0.155
Actual implementation of risk control×PC			0.038
Supervision×PC			0.151
R^2	0.367	0.388	0.471
Adjusted R^2	0.323	0.339	0.394
F	8.201	7.906	5.446
F change		0.295***	2.460***

Notes: *$p < 0.10$; **$p < 0.05$; ***$p < 0.01$

Table XIII. Hierarchical regression results using product complexity as a moderator on the relationship between the operational risk management and customer complaints

in Model 3, the R^2 improved even higher, to 47 percent, which indicates that the moderating variable generally influences the relationship between the operational risk management and customer complaints. This also indicates that the operational risk management, when interacting with product complexity, was able to explain an additional 8 percent of the variance in the customer complaints when the moderator was included. It can be observed that there is no significant direct relationship between product complexity and customer complaints. However, after interaction, only one dimension in operational risk management is significant, which is analyzing risk control measure. This proves that product complexity moderates the relationship between perceived analyzing risk control measure and customer complaints. Hence, the higher the product complexity, the stronger the relationship of operational risk management and customer complaints.

The operational risk management dimension that has significant relationship with customer complaints are practice of hazard identification, analyze risk control measure, formulation implementation of risk control and actual implementation of risk control. Product complexity has a direct and interaction effect on customer complaints. After interaction, only one dimension in operational risk management is significant, which is analyzing risk control measure. Therefore, product complexity does moderate the relationship between operational risk management and customer complaints.

9. Discussion

Since operational risks are encountered in several areas of business operations, financial institutions are facing a continuous increase in related regulations. Therefore, the top

management cannot abide by inefficient operational risks management because it may lead to fatal consequences (Rose, 2009) Operational risk should not be viewed solely in isolation as a divisional or a business specific issue. It is often helpful to designate a person at a senior level to drive the firm-wide management of operational risk. Regardless of a firms' attitude toward risk, managers will need the tools to help them determine the effectiveness of operational risk controls. The application of and extent of an organizations' controls may vary depending on its culture and attitude *vis-à-vis* risk tolerance. Line and senior managers, however, need to be consistent on the application of policies and processes. This is an important component of risk management, both to address pressing issues and to shape organizations' strategic direction over time. Organizations also need to provide managers with the appropriate incentives to continuously lessen their exposure to unwanted operational risk and to continue expanding their commitment toward operational risk management (International Association of Financial Engineers (IAFE), 2001). Understanding risk and risk management positively affect risk management practices (Rosman, 2009; Hassan Al-Tamimi and Mohammed Al-Mazrooei, 2007). Regardless of any measurement methodology the banks developed, effective management of operational risk requires an integrated approach to the development of staff skills and training, optimization of the business processes, development of a risk awareness culture and a technological infrastructure that allows financial institution to effectively process, monitor and manage businesses (Namazian and Eslami, 2011).

According to the findings, the total mean for operational risk management is 4.56. This means that the respondents accounted for all of the items identified as existing in their implementation of perceived operational risk management in the branch. This is in line with Samad-Khan (2008), which clearly mentioned that in the current operational risk management environment, senior management views operational risk not as an afterthought, but as an integral part of strategic planning, business management and the enterprise risk management processes. Samad-Khan (2008) also stated that many firms already recognized the benefits of operational risk management, and it could lead to the setup of a new standard for industry-best practices.

The total mean for perceived operational risk management in this study is higher relative to that of Alrashidi and Bakeel (2012), with the total mean of 3.56. Therefore, this study concluded that bank branches acknowledge the implementation of perceived operational risk management as very important. This is in line with Bodla and Verma (2008), which stated that Indian bank branches implemented operational risk management. Moreover, according to Ana-Cornelia (2012), the need to manage operational risk can be explained by changes in business environment, where infrastructure and new organizations structure have come about, and competition becomes more intense, resulting in increased automated technologies and electronic commerce, complexity of products due to globalization, decentralization, and changes in the banking system via mergers, acquisitions and consolidations alongside increased retail trade. According to Marimuthu and Ibrahim (2013), after the Asian financial crisis in 1997, merger and acquisition activities have greatly affected the Malaysian banking ecosystem. Therefore, the resulting competitive and challenging environment makes it crucial for financial institutions to understand the risk they are facing and the importance of possessing effective controls and procedures, systems, and skills in place to deal with them (Namazian and Eslami, 2011).

10. The relationship between operational risk management on customer complaints

Based on the regression results, there are negative and positive significant relationships between perceived operational risk management and customer complaints. Out of the eight hypotheses, only two are negatively significant, while two are positively significant. In this relationship, the practice of hazard identification and formulation of implementation of risk control has a strong and significantly negative relationship with customer complaints.

As per the descriptive results, the bank branches are implementing the practice of hazard identification in their respective daily operations. Examples of possible hazard in branches include data entry error, system errors in transaction process, ineffective documentation of processes, failure to provide accurate external reporting, failure to ensure effective contract documents, inaccurate customer records, incomplete mandatory reporting and poor management decisions or oversight (Basel Committee on Banking Supervision the Joint Forum, 2003). If bank branches can detect possible hazards and threats in their daily operations, customer complaints can be minimized to reduce the likelihood of operational losses due to complaints. Branches that understand the formulation of risk controls can minimize customer complaints. Therefore, it is the branches' responsibility to adhere to the procedure formulated in the implementation of risk control. Banks are very particular when it comes to customer complaints. Therefore, reducing customer complaints is one of the main agendas in the banks' objective. These results are supported by Cydulka *et al.* (2011) and Macintyre *et al.* (2007). The formulation of implementation of risk controls assure the customers that bank branches are fully responsible in protecting their accounts. The assurance increases customer confidence in the bank branches, as per Macintyre *et al.* (2007).

Analyze risk control measure and actual implementation of risk controls have a positive and significant relationship with customer complaints. Analyzing risk control measures is the responsibility of the branches when determining strategies and tools for risk mitigation, while also ensuring that the number of control measures being selected is enough to mitigate the designated risks. It is unimportant for customers to be aware of the strategies or tools the branches utilize to mitigate risk, but it is important for the branches to completely understand the factors behind every customer complaint in order to ensure that the right tools are selected for risk mitigation. Hickson *et al.* (2002) stated that the identification of an association between complaint data and risk management activity offers an excellent opportunity for addressing sources of patient complaints that could end up as lawsuits.

However, when branches implement risk controls, customers reported it to be too rigid due to the many associated rules and procedure. Customers feel that the risk control does not help or are unsuitable in protecting their banking interests. For example, when a customer issues a check to a third party (large amount), it is the responsibility of the current account officer to confirm with the drawer the validity of the check, that it is good for payment, and is issued in the payee's name. When the current account officer is unable to obtain confirmation from the drawer, the officer cannot deposit the check. However, the drawer is not expected to react to this favorably, as a bounced check damages their (business) reputation.

Apart from the above findings, it is interesting to note that the documentation of hazard identification, risk analysis, control decision and supervision lack a significant relationship with customer complaints. This is due to the fact that the documentation of hazard identification is related to the recording of past events that negatively impact branch operational risk management. The information on the cause of past events is important, as it can be used to determine risk severity via risk analysis. Control decisions are made to ensure that proper control procedure is implemented for risk mitigation. Finally, supervision by branch/assistant managers ensure that operational risk management plans are implemented accordingly. Therefore, it is unimportant for customers to be aware of these procedures, as they have little to do with its actual implementation.

11. Product complexity moderates the relationship between operational risk management and customer complaints

This study found that product complexity, when interacting with perceived operational risk management, was able to explain an additional variance in customer complaints. Additional explanatory indicates that the moderating variable generally influences the relationship

between perceived operational risk management and customer complaints. Therefore, product complexity does moderate the relationship between perceived operational risk management and customer complaints. Post-interaction, only one dimension in operational risk management is significant, which is analyzes of risk control measure. This finding supports the role of product complexity as a moderator, as outlined in Swaminathan (2003), Dubey *et al.* (2017), Eckstein *et al.* (2015), Dubey and Gunasekaran (2015), d'Astous and Guèvremont (2008), Kuester and Buys (2009), Croitoru (2011) and Blome *et al.* (2014). Kuester and Buys (2009) stated that products with many attributes is highly complex and contains detailed information. Subsequently, the probability of information overload and customer confusion occurring exceeds the purchase situations characterized by low product complexity. The difference between the amounts of information in highly complex products vs simple products is that the level of complexity for the former is higher.

12. Conclusion

This study contributed to literature by establishing and using a model to conceptualize the outcomes of operational risk management in the banking industry. It also used the resource-based view to explain the relationship between operational risk management and customer complaints and the moderating effects of product complexity on the relationship of operational risk management and customer complaints. Resource-based view indicated that firms need resources to realize a competitive edge among its competitors and increase performance (Grant, 1996). Resources include physical capital resources, human capital and organizational capital, which include firms' formal reporting structure, it is formal and informal planning, controlling, coordinating systems and informal relations among groups within a firm and between a firm and those in its environment (Barney, 1991). This study confirmed that the components of operational risk management, namely practice of hazard identification and formulation of implementation of risk control, as having a negative and significant relationship with customer complaints. Therefore, both components of operational risk management are important resources in minimizing customer complaints in conventional bank branches. Based on these results, the usage of the resource-based view theory in the banking industry, as well as the operational risk management as a bank resource was confirmed. This study presented its findings on the operational risk management among Malaysian conventional bank branches. Hence, the practical implications of this study can be used by the banking industry, such as Malaysian banks, BNM, IBBM, ABM and the Basel Committee. Operational risk management is important for many organizations, especially banks. The study found some negative and positive significant relationships between the perceived operational risk management and customer complaints. The dimensions of operational risk management that reported a negative and significant relationship with customer complaints include practice of hazard identification and formulation of implementation of risk control, while analyzing risk control measure and actual implementation of risk control has a positive and significant relationship with customer complaints. Thus, it is essential for the banks' management to identify the correlation between the operational risk management and customer complaints. The management can improve their existing policies/strategies for mitigating risks in the bank and enhance customer satisfaction in the context of services rendered by tellers, which is in line with the aspiration of BNM to make risk management the fundamental component in safeguarding assets and bank reputations.

Finally, the study presents the results on the level and type of customer complaints received by bank branches. The branches must take appropriate actions to minimize customer complaints, especially complaints pertaining to customers not receive their monthly current account statement. The branches must also investigate the factors behind these complaints, such as customers new address not being updated or system failure in

generating customers' monthly statement. Front liners, especially bank tellers and officers, need to ensure that all data input is correct and that any changes in customers address are properly updated after verifications. To avoid complaints on wrong transaction, it is the responsibility of the front liners, especially tellers, to check the validation on the bank slip prior to getting back to the customers (IBBM, 2010). It is the ultimate priority of the bank tellers and officers to rectify any mistakes in order to avoid a cascade of errors that could result in negative consequences.

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