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DYNAMIC CAPABILITIES FACILITATE THE USE OF TECHNOLOGY TO PROMOTE ORGANIZATIONAL AMBIDEXTERITY

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Abstract. The organizational ambidexterity of commercial banks has been the subject of recent research. As a novelty, research has yet to be conducted on the banking sector in a dynamic environment. This study's goal is to identify the variables that affect ambidextrous banking. The research methodology uses quantitative techniques with six constructs: organizational ambidexterity (OA), dynamic capability (D-CA), organizational culture (O-CU), human capital (H-CA), and technological capacity (T-CA) with moderator environmental dynamism (E-DY). The research questionnaire was measured using seven Likert scales, and the data was processed using structural equation modeling and Smart PLS software. The results of all hypothesis tests are as follows: First, technological capacity, organization culture, and dynamic capability have a positive effect on organizational ambidexterity. Second, technological capacity, human capital, and organizational culture have positive results for a positive effect on dynamic capability. Third, the moderating effect of E-DY on the relationship between T-CA and OA has a negative and significant impact. Fourth, the moderating effect of E-DY on the relationship between O-CU and OA is insignificant. Fifth, the moderating influence of E-DY on the link between dynamic capability and organizational ambidexterity has a positive and significant impact. This study will contribute to the theoretical aspect by enriching the theory that human resource management, technological capacity, organizational culture, and dynamic capabilities are essential in organizational ambidexterity.

Keywords: dynamic capability, organizational culture, human capital, technological capacity, environmental dynamism, organizational ambidexterity.

JEL Classification: L20, L89, O15.

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1. Introduction

Indonesian banks show lower efficiency levels than other ASEAN countries (Effendi et al., 2018). For the Asia Pacific region, Indonesian banks offer the lowest average technical efficiency levels (Yang et al., 2019). Banks are also facing disruption of savings and financial account numbers due to fintech practices, with services such as mobile money accounts, utility bill payments, use of mobile phones, and the internet to access financial institution accounts and digital payments (Parameshwar et al., 2019). Advances in information technology and fintech competition require banks to review their competitive advantages (Jakšič & Marinč, 2019). The widespread adoption of online and mobile banking platforms and online and mobile payment solutions among smartphone and internet users has paved the way for the rise of fintech (Wewege et al., 2020). Over the past decade, traditional financial technology has altered, and a new type is emerging.

Within the past decade, traditional financial technology has changed significantly, and a new type of financial technology is also emerging (Parameshwar et al., 2019). Indirectly, fintech disrupts existing conventional financial institutions (Wewege et al., 2020).

Furthermore, with the shocking effects of COVID-19, the need to transform businesses in line with the Industry 4.0 paradigm is increasing (Mahmood & Mubarik, 2020). Contextually, COVID-19 has accelerated the transformation of digital businesses and entire industries (Soto-Acosta, 2020). Companies must balance several types of innovation initiatives and market exploitation and improve their technology absorption capacity in addressing the challenges posed by the pandemic (Mahmood & Mubarik, 2020). As a result, businesses frequently employ a dual strategy of exploration (looking for new opportunities) and exploitation in order to stay competitive (to utilize existing resources or capabilities) (Aslam et al., 2018). The previous research argues that companies must be able to

pursue both strategies, namely flexibility and efficiency, by developing ambidexterity capabilities (Aslam et al., 2018; Ojha et al., 2018; Wamba et al., 2020). Research Jansen et al. (2012) suggests that unit ambidexterity benefits the succeeding unit performance, but there is little theory and evidence to back this up.

Healthy and efficient banking supports a country's macroeconomic stability (Goyal et al., 2018). Banking is the "fuel" of other economic sectors, and its growth rate is far higher than that of manufacturing and other service businesses (Campanella et al., 2016). Banking as a financial services industry ranks highest in technology transformation (Brock & von Wangenheim, 2019). Innovation-oriented technological advancements are central to identifying drivers for improved retail network performance (Mitropoulos & Mitropoulos, 2020).

The commercial banking industry is a bank unit expected to continuously improve its existing products, reduce costs in serving current customers and existing markets, and advance. However, to remain competitive in the face of new commercial bank entrants, the unit must introduce new products and develop unique advantages (Jansen et al., 2012). It is connected to ambidexterity, the simultaneous exploration and exploitation capacity that allows businesses to evolve through time (O'Reilly & Tushman, 2008). Banks have a context of organizational ambidexterity because of their nature, size, and importance, but also because of the regulatory constraints they face regarding the scope of their mission, all of which affect the pursuit of new opportunities (Campanella et al., 2016).

High technological unpredictability makes it difficult for companies to obtain or maintain technological advantages, so utilizing innovative resources from within and outside is necessary to improve the company's innovation performance (Zhai et al., 2018). To answer the question of how businesses deal with technological change, financial institutions must turn to the dynamic capabilities view (Konlechner et al., 2018). Businesses in today's fast-paced environment are constantly adapting to new possibilities and threats, and as a result, they are boosting the pace and effect of strategy execution (Slagmulder & Devoldere, 2018). Today's business enterprises rely significantly on information technology resources, and the ability of enterprises to use technology plays a vital role in influencing the relationship between human resources to study the current business environment (Zheng et al., 2020). Banking transactions are broadly transforming into digital banking transactions that need special attention, but previous studies on how to prepare and use artificial intelligence in company operations have been little researched (Brock & von Wangenheim, 2019). It encourages banks to have reliable technological capacity. Compared to their less technologically advanced counterparts, businesses with a high technological capacity are better able to innovate and develop new goods, systems, and processes (Andrade et al., 2020). The speedy transformation of technology is driving the emergence of new business models. This impact has led to the need to understand digital technology and basic technical skills to make decisions due to digitalization (Hensellek, 2020).

Human bankers have not been entirely replaced by artificially intelligent, thus becoming a competitive advantage for banks also supported by branch networks geographically and culturally close to customers (Jakšič & Marinč, 2019). Therefore, it is important to understand employees' beliefs and attitudes as part of organizational change (Alavi & Gill, 2017). Internal marketing unites firms around customer service, employee autonomy, and service excellence (Kelemen & Papasolomou, 2007). However, it is a challenging process that can lead to schisms, conflicts, and ambiguity in the new organizational culture (Kelemen & Papasolomou, 2007). As a direct response to the subprime mortgage crisis, the Dutch government undertook a reform program that prioritized the creation of a code of ethics and bankers' oaths for the banking industry (Ganderson, 2020). Employee participation in the organization, proper management, values, and norms reflected in ambidextrous organizational culture support employees to direct efforts toward exploration and exploitation (Úbeda-García et al., 2018).

Environmental dynamism is characterized by changes in technology, variations in customer preferences, changes in product demand, and unpredictable changes (Jansen et al., 2006). A dynamic business environment can encourage companies to engage simultaneously in exploitative and exploratory innovation (Yi-Ying et al., 2011). In order to remain competitive amidst dynamic market conditions and swiftly evolving product offerings, organizations must engage in exploitative practices and sustain a culture of innovation (Jansen et al., 2006; Teece, 2007). Due to significant environmental dynamism, organizations must respond fast to client demands and develop technologies to remain sustainable (Zhai et al., 2018).

Previous research states how efforts to reach ambidexterity are interpreted and managed by the people involved, but it is still not explored much (Papachroni et al., 2016). In any organization, ambidexterity depends on employees engaging in innovative processes in the workplace, yet the necessary measures for human resource management practices are still inadequate (Swart et al., 2019). This study delves further into D-CA s by linking the moderating effect of E-DY with the associated constructs of D-CA, O-CU, and T-CA to explore organizational ambidexterity.

The novelty in this research is that first, ambidextrous commercial banking research has been studied: Campanella et al. (2016) related to bank performance (return on equity), Jansen et al. (2012) related to unit performance, Marabelli et al. (2012) cross-bank unit process. However, research on Indonesia's commercial banking industry in a dynamic climate and the pandemic is still lacking. The nation's banking sector fuels and catalyzes numerous other sectors and parts of society that significantly impact millions. Second, the research gap regarding the relationship between ambidextrous work and human resource management practices states that research on this topic is limited (Ferraris et al., 2019; Papachroni et al., 2016; Swart

et al., 2019). Third, digital banking transactions require specific attention, yet studies on preparing and deploying artificial intelligence in firm operations have been scarce (Brock & von Wangenheim, 2019). Conversely, E-DY affects the link between E-DY and OA (Andrade et al., 2020). The fourth, dynamic capability, has become a paramount concern, yet few empirical studies examine its antecedents and outcomes (Hung et al., 2010). This research proposes technological capacity, organizational culture, and human capital as antecedents of dynamic capability.

The primary portion of the paper investigates the supporting literature and theories for OA ideas. The relationship between D-CA, O-CU, and T-CA in the Indonesian banking sector is clarified. Following this, we will detail the methods employed in our research and present the findings. A summary of the results, an analysis of the areas where further research is needed, and a consideration of the practical implications for managers are included in the conclusion. Following is the structure of the current investigation. Initially, the theoretical underpinnings and formulation of the hypotheses of the investigation are delineated. The research methodology is then described. The results and contributions, implications, and suggestions for future research are subsequently discussed.

2. Literature review

2.1. Organizational ambidexterity

Organizational ambidexterity is the company's ability to equilibrium between discovery and exploitation, and the most basic is that the company can survive in a dynamic environment (Anzenbacher & Wagner, 2020). Ambidexterity entails, in essence, the ability to match one's actions with present needs to fulfill them while simultaneously demonstrating adaptability and proactivity in foreseeing forthcoming changes (Kafetzopoulos et al., 2023). Ambidextrous companies employ two discrete learning concepts – exploration and exploitation – to oversee environmental uncertainty optimally (Hwang et al., 2023).

There are two main approaches to learning in organizational ambidexterity: exploration and exploitation. It is increasingly stressed in contemporary literature, and by the concept of ambidextrous organizations, businesses must achieve a balance between exploration and exploitation (He & Wong, 2004). Exploration and exploitation can be kept in check by delegating tasks to a higher-level system when numerous subsystems interact. Exploration and production can be separated into subsystems without seriously impacting overall efficiency (Gupta et al., 2006). When an organization is ambidextrous, that is, it can engage actively in both discovery and profit-making, it divides itself into distinct units or individuals who focus on either exploration or exploitation.

This balance between exploitation and exploration has been explained in detail by Levinthal and March (1993), Lewin et al. (1999), March (1991). Organizations must allocate resources to exploit existing practices or explore new alternatives. When referring to both types of innovation, explicitly include non-technical aspects such as changes in the knowledge and skills underlying products, services, and technologies (Jansen et al., 2006).

Exploitation includes efficiency, production, selection, and execution (March, 1991). Through exploitation, the organization learns to refine its capabilities, apply current knowledge, and focus on current activities in the existing domain (Holmqvist, 2003). The business increases the scope of current expertise, the quality of existing production methods, the variety of existing offerings, and the effectiveness of existing means of distribution (Abernathy & Clark, 1985).

Exploration implies variety, experimentation, flexibility, risk-taking, and innovation. In order to anticipate and respond to unmet consumer demands, exploratory inventions tend to be radically different (Benner & Tushman, 2003; Danneels, 2002). Thus, exploratory innovation results from searching for new organizational routines and discovering new approaches to technology, business, processes, and products (McGrath, 2001).

A recent body of conceptual research defines exploratory and exploitative innovation as two separate innovative learning outcomes and ambidextrous firms can reconcile these imperatives. Types of innovation can be classified into two domains: (1) proximity to existing products and services and (2) proximity to existing customers/market segments (Abernathy & Clark, 1985; Benner & Tushman, 2003; Danneels, 2002). In the face of competing needs for exploration and exploitation, an ambidextrous firm can maintain a steady course and pursue both.

2.2. Technological capacity and organizational ambidexterity

Technological absorptive capacity (TAC) is a process that "involves acquisition (through which firms acquire so-called technological stocks), assimilation and transformation (the capacity to develop and refine routines to facilitate the merging of existing technological knowledge with that acquired, and to assimilate this knowledge and to exploit technological knowledge)" (García-Morales et al., 2007). It is widely agreed that technological absorptive capacity is a crucial capability for businesses to take advantage of Industry 4.0 since it significantly impacts both the adoption and development of new technologies within those organizations (Mahmood & Mubarik, 2020).

The study on firms from eight industry categories in Taiwan implies that building technological capacity enables firms to effectively integrate and combine external technological knowledge (exploration) with existing knowledge (exploitation) to generate better new product sales (Tsai & Hsieh, 2009). Companies with solid TACs can have a better ability to achieve organizational ambidexterity. In contrast, insufficient technological absorptive capacity impedes improving technological knowledge and organizational ambidexterity (Mahmood & Mubarik, 2020). The significance of IT capabilities in fostering organizational

ambidexterity, resilience, and SME performance is critical (Trieu et al., 2023). In short, technological capacity can be an instrument in achieving organizational ambidexterity. From the above references, the following hypothesis can be formulated:

H1: T-CA has a significant effect on OA.

2.3. Technological capacity and dynamic capability

Organizations that can absorb technology internally and externally will benefit from the supply of technology (González-Moreno et al., 2019; Valdez-Juárez & Castillo-Vergara, 2021). The organization reconfigures current capabilities and creates and updates other capabilities through dynamic capabilities (Jantunen et al., 2018; Patrício et al., 2021). In the current business environment, only agile, adaptable firms willing to incorporate new management techniques, embrace cutting-edge technology, and never stop inventing will be successful (Feng et al., 2020; Sutopo et al., 2019). Based on the description above, it can be formulated that technological capacity contributes to dynamic capability, or the following hypothesis can be proposed:

H2: T-CA has a significant effect on D-CA.

2.4. Organizational human capital and dynamic capability

As conceptualized by Becker (1993), human capital refers to the skills and knowledge individuals learn and develop through their previous experience, training, and education. According to Wright et al. (2014), the fundamental qualities of human capital include knowledge, education, experience, and skills. Many managers' perspectives on human capital are industry- or sector-specific, while others are broader and may be applied to teams, units, functions, technologies, organizations, or fields (Helfat & Martin, 2015). When an employee's education, experience, training, and talents are fully utilized, it can lead to greater productivity in work. We call this "human capital" (Mahmood & Mubarik, 2020). Adner and Helfat (2003) and Helfat and Martin (2015) identified managerial cognition, social capital, and human capital as the three pillars upon which the ability to drive strategic transformation rests.

Some studies have tried to explain how marketing, human resources, or operations strategies can trigger the creation of dynamic capabilities (Bruni & Verona, 2009). Human resources are an integral aspect of a company's intellectual capital, and good employee innovation results in a competitive advantage for commercial banks (Ali et al., 2021). A study of manufacturing companies in the US (Chiang et al., 2012) discusses supply chain agility as a dynamic capability because it enables strategic sourcing and flexibility of companies with human capital. Some studies link these HR practices directly to learning that generates fundamental factors and explains the development of dynamic capabilities. According to studies, the results of López-Zapata and Ramírez-Gómez (2023), organizational ambidexterity is positively correlated with intellectual capital. Human capital has been linked to the development of dynamic capabilities because of employee knowledge (Gutierrez-Gutierrez & Antony, 2020; Hsu & Wang, 2012; Nieves & Haller, 2014), and the learning developed within the organization can be used to adapt to the current situation (Crick et al., 2013; Matsuo & Nakahara, 2013). Existing scholarly literature indicates that human capital, comprising the knowledge, motivation, and dedication to idea production and the cognitive talents of the organization's personnel, is the primary driver of exploration and exploitation-based innovation (Martínez-Falcó et al., 2023). It can be stated that human organizational capital contributes to dynamic organizational capability, or the following hypothesis can be formulated:

H3: H-CA has a significant effect on D-CA.

2.5. Organizational culture and dynamic capability

The diverse and ever-changing cultural environment seen as necessary in adjusting to the new culture is why organizations develop more successfully than others (Moon, 2010). An organization's ability to integrate, grow, and reorganize its internal and external competencies in response to a rapidly shifting environment is known as its "dynamic capability" (Teece et al., 1997). The cross-cultural context incorporates cultural differences in various areas, including language, religion, morals, women's status, individualism, collectivism, attitudes toward authority, forms of governance, legal systems, and more (Chirkov et al., 2005).

Previous research shows a positive relationship between organizational culture and dynamic capability. Studies in the high-tech industry in Taiwan show that organizational learning culture contributes significantly to dynamic capability (Hung et al., 2010). Building dynamic capability requires the implementation of an organizational culture that encourages change and innovation (Camisón & Puig-Denia, 2016).

To sustain a competitive edge in a highly dynamic environment, it must replicate the company's vast resources and dynamic capabilities (Teece, 2007). A company's ability to (a) identify and shape possibilities and threats, (b) grab opportunities, and (c) preserve competitiveness by upgrading, combining, safeguarding, and, when necessary, restructuring tangible assets and intangible business enterprises are referred to as having dynamic capabilities (Mikalef et al., 2020). Sánchez-Cañizares et al. (2007) includes culture in infrastructure assets, considering it as corporate culture. He defines it as "the way the structure is made." It includes the values, rites, rituals, and heroes the company's employees recognize and share. A strong corporate culture can be an asset if it reflects the organization's business philosophy.

Then, the following hypothesis can be built:

H4: D-CA is significantly impacted by O-CU.

2.6. Organizational culture and organizational ambidexterity

Studies relate organizational culture to innovation and its evolving role in the success achieved through innovative processes. Previous studies show positive results between ambidextrous organizational culture and ambidexterity, where the culture is based on two sets of organizational values and norms, namely organizational diversity and shared vision (Úbeda-García et al., 2018). Contextual ambidexterity in the organization's culture encourages organizational creativity and discipline (Simsek, 2009). Organizational learning literature argues that diversity enhances creativity and can be incorporated into standards that offer direction and discipline. Thus, institutional diversity and a shared vision reinforce each other to form an ambidextrous organizational culture. It provides an insight into the kind of culture that contextual ambidexterity requires but has not been theoretically included or observed in the organizational ambidexterity literature (Wang & Rafiq, 2014). In today's dynamic world, ambidexterity arises due to innovation, the ability to simultaneously achieve incremental and radical innovation, and exciting thinking. The literature shows that O-CU is critical to managing successful innovation (Baškarada et al., 2017).

Thus, the following hypothesis can be formulated:

H5: O-CU has a significant effect on OA.

2.7. Dynamic capability and organizational ambidexterity

Innovation ambidexterity is conceptualized as a dynamic organizational capability that includes the routines and processes that ambidextrous organizations rely on to allocate, mobilize, coordinate, and integrate contradictory innovative efforts (Jansen et al., 2009; O'Reilly & Tushman, 2008; Sirmon et al., 2007; Teece, 2007). Innovation ambidexterity is a complex dynamic capability that facilitates new capabilities and resource configurations and is associated with additional sources of sustainable competitive advantage: advantages far beyond those provided by each innovation activity in isolation (Božič & Dimovski, 2019). Innovation ambidexterity has been characterized as a firm's "learning-to-learn" ability that can be managed to promote sensing, seize new opportunities, and reduce possible dependency effects (O'Reilly & Tushman, 2008, 2013). Developing and employing dynamic capabilities involves exploitation activities, reconfiguring existing resources, and exploring them by designing new resources and their combinations (Schilke, 2014). From the above references, the following hypothesis can be formulated:

H6: D-CA has a significant effect on OA.

2.8. Effects of environmental dynamism on technological capacity and organizational ambidexterity

Environmental dynamism can also lead to uncertainty in technological capacity and in a context of change where competitive advantage is often short-lived (Bierly & Daly, 2007). Environmental change directly impacts a company's ability to innovate; therefore, product development initiatives may encourage more exploration and exploitation (Revilla et al., 2010). A similar study presented the results obtained from Spanish industrial firms, showing that environmental dynamism positively relates to organizational ambidexterity, strengthening technological performance (Soto-Acosta et al., 2018).

Companies adopt a strategic cost-control (efficiency) stance in a less dynamic environment, and technological investment decreases (Andrade et al., 2020). In a dynamic environment, companies tend to direct efforts toward exploration activities (Benner & Tushman, 2003). Companies that act on exploitative rather than exploratory process strategies show a trend toward stability (Andrade et al., 2020). In this context, the company's internal learning process is slower, affecting ambidexterity, and the focus is on product improvement rather than product creation (Bierly & Daly, 2007).

The environment's complexity level, uncertainty, competitiveness, constant technological changes, variations in consumer preferences, and pressure to develop and innovate products and services (Jansen et al., 2006; Kim & Rhee, 2009). It is an aspect that influences the selection of corporate routines, processes, and practices for survival in an increasingly competitive market associated with exploration and exploitation (González-Benito et al., 2014). So, environmental dynamism is a crucial factor in the connection between discovery and exploitation, and as such, it impacts organizational ambidexterity. Therefore, the dominance of various aspects of the environment ultimately shapes and directs the process of exploitation and discovery internally (Jansen et al., 2006). In previous studies, IT capacity in the technology-organization-environment (TOE) framework has been used to understand the causes of innovation duality and the mediating function of environmental dynamics (Soto-Acosta et al., 2018). So, the following hypothesis can be formulated:

H7: E-DY significantly moderates T-CA and OA.

2.9. Moderating effect of environmental dynamism on organizational culture to organizational ambidexterity

The concept of industry-driven culture characteristics has significant implications for culture change. When the industry environment changes to a competitive environment, customer requirements or societal expectations and behaviors are based on past assumptions and likely ineffective values; thus, companies are likely to experience adverse outcomes (Gordon, 1991). It creates pressure for change, but some resist change. Cultural change at the assumption level involves a total restructuring of the industry (Gordon, 1991), for example, by changes in public expectations (including regulation or deregulation), the addition of significant new technologies or substitutes, the entry of different types of competitors, or, perhaps, the maturation of an industry (Gordon, 1991).

The need for companies to adapt to environmental changes, rapid dissemination of information to relevant people, and rapid decision-making put pressure on organizations to reorganize their business processes (Khan & Mir, 2019). So, new departments and work units were formed, and employees had to follow the changes in organizational culture. Although some researchers believe ambidexterity is more valued in environmental dynamism (Wang & Li, 2008). Others argue that under dynamic environments, companies cannot adequately predict changes in technology, future earnings, or investment requirements (Schilke, 2014).

Thus, the following hypothesis can be formulated:

H8: E-DY significantly moderates O-CU on o OA.

2.10. Moderating effect of environmental dynamism on organizational dynamic capabilities on organizational ambidexterity

Described dynamic capability as 'the firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments'. Dynamic capability uses resources, specifically integrating, reconfiguring, acquiring, and releasing resources to match and even create market changes (Eisenhardt & Martin, 2000). Dynamic capability serves as a means to modify operational capabilities to better suit environmental demands (Helfat & Martin, 2015). Dynamic capability contributes theoretical insights to the resource-based view to explain competitive advantage in dynamically evolving environments (Ambrosini et al., 2009; Vogel & Güttel, 2013). Social media strategic competence is significantly and positively impacted by organizational ambidexterity of exploration and exploitation in the context of small and medium-sized enterprises (SMEs), with exploration proving to be more effective than exploitation. In addition, it was discovered that environmental dynamism moderated the effect of exploitation, explaining the impact of uncertainty on social media strategic decisions (Niramarn Ngammoh Atthaphon Mumi & Issarapaibool, 2023).

Quantitative analysis of SME companies in Austria shows a significant relationship between environmental dynamism and dynamic capability: the higher the environmental dynamism, the more critical the dynamic capability. Furthermore, the dynamic capability is helpful for exploitation and exploration (Frank et al., 2017). Contribution of dynamic capabilities to promote the exploration and exploitation of technologies, capabilities, and knowledge; this is the definition of ambidexterity (Konlechner et al., 2018, p. 196). When environmental change is slow, however, the impact of a company's dynamic skills on its competitive advantage will be moderate (Schilke, 2014).

Ambidexterity is a D-CA that can put companies in a privileged position regarding competitive advantage, with environmental dynamism allowing companies to utilize threats in new business opportunities (Soto-Acosta et al., 2018).

H9: E-DY significantly moderates the ability of D-CA to OA.

3. Methods

This study aims to develop a model explaining the elements influencing ambidexterity. Thus, it is critical to choose the proper methodology to accomplish the study's goals, describe how the constructs are assessed, and outline the research plan, including the methods for data analysis. The selection of appropriate processes and techniques is vital to ensuring the validity of survey results. The methodology is defined as the nature of the research design and methods. A research strategy describes the steps taken to complete the study. Methods include gathering and analyzing information (Cohen et al., 2018).

This research method is quantitative. Quantitative research can classify the data collected and describe the relationship between theory and practice. In quantitative research, the relationship between measurement constructs and the application of statistical techniques can be tested. While collecting quantitative data, it is crucial to take a random sample. It is also necessary to research

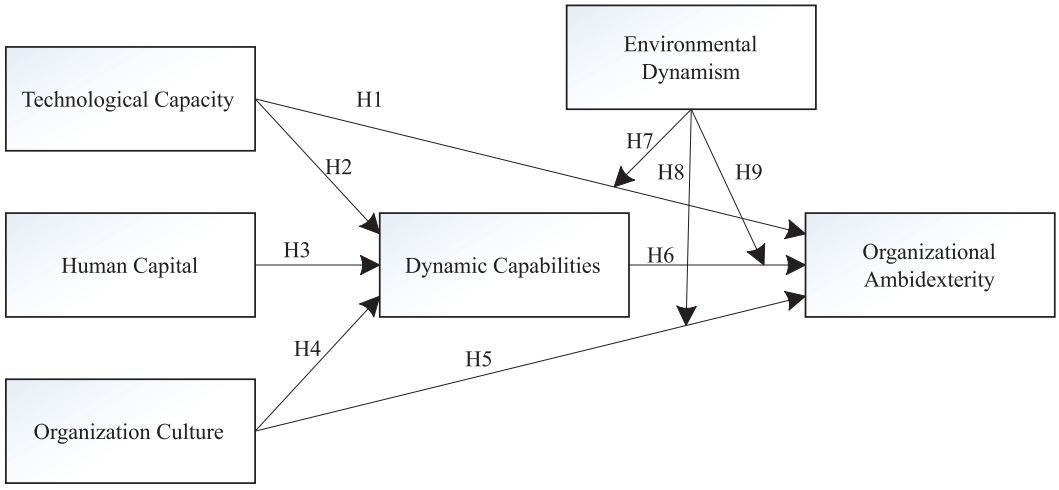


Figure 1. Conceptual model of organizational ambidexterity

the instrument needed to collect the data. Quantitative research design is often carried out with three activities: sampling, measurement, and procedures for causal inference (Zyphur & Pierides, 2017).

In quantitative research, a sizable sample of respondents is surveyed using structured questions with predetermined responses. Quantitative methods focus on the statistical generalization of findings to clarify and predict outcomes by looking for regularities and cause-and-effect relationships between constructs (Creswell & Creswell, 2018). In the social sciences, data collection is usually done using survey questionnaires (Saunder et al., 2019). Quantitative methods in business research include questionnaires, field experiments, and laboratories (Saunder et al., 2019). This activity usually produces a representation (of a population/phenomenon) whose correspondence can then be estimated or tested. Quantitative research emphasizes data collection and analysis with a deductive approach to the relationship between theory and research (Bryman & Bell, 2007).

3.1. Data collection and sample design

This study involves 107 commercial banks and is represented by respondents who are bank leaders at the director level and master bank operations in general. Email surveys were issued to bank executives, and up to 80 responded to all questions, for a response rate of 74.77 percent.

Supposedly, the other 25,23% who did not react indicate the closed nature of Indonesian financial institutions. According to Hair et al. (2017a), the "rule of thumb" minimum sample size is ten times the number of indicators of any endogenous variable in the PLS research model. However, this is a rough calculation of PLS-SEM; just like other statistical methods, it is necessary to consider the sample size according to the background and data characteristics of the study (Hair et al., 2017a). To counter this, Power Analysis can estimate the optimal sample size depending on the model and the maximum number of predictors (Hair et al., 2017a). Hair et al. (2017a) cite two power tests, G*Power and Cohen (1992), as a reference for determining the sample. According to Hair and Cohen, who inspired this study, seven are the most independent variables that can be included in the measurement and structural models. This study needs 51 observations to have 80% statistical power to detect an R^2 value of at least 0.25 (with a 5% risk of error) if the measurement model has good outer loading quality (>0.7).

In preparing the questions in the questionnaire, in addition to paying attention to the question items made, one also must pay attention to the structure and definite answers to the questionnaire questions themselves. Besides the risk of getting biased answers, it can also lead respondents to certain tendencies. Respondents perform a series of cognitive processes when answering questionnaire items, namely: (1) comprehension (respondents pay attention to questions and interpret them), (2) retrieval (respondents generate retrieval strategies and then retrieve relevant beliefs from memory), (3) judgment (respondents integrate beliefs into conclusive judgments), and (4) response (respondents map judgments to available response categories and answer questions) (Krosnick, 1991; Weijters et al., 2010). Biased answers or responses can occur in the above process (Krosnick, 1991; Swain et al., 2008).

This research uses 7 Likert scales: The questionnaire in this study was completely anonymous, which aims to minimize social pressure and reduce bias (Saunders et al., 2019). In addition, by answering anonymously, individuals are more motivated to answer honestly.

3.2. Measurement instrument

The research model in Figure 1 is built based on the development of the above hypotheses. As stated in Table 1, the research questions were adapted from numerous prior investigations.

Table 1. Measurement tool

Construct: Organizational Ambidexterity (source: Gibson & Birkinshaw, 2004; Gupta et al., 2006; Jansen et al., 2006; Li, 2016; O'Reilly & Tushman, 2013; Soto-Acosta et al., 2018; Úbeda-García et al., 2018; Wang & Rafiq, 2014).
Exploration: Our company can acquire new technologies. Our company is capable of developing a mature management organization. Our company can create new products/services. Our company conducts experiments in creating new products/services. Our bank commercializes each new product/service. Our company capitalizes on new opportunities. Our company utilizes new distribution channels in marketing products/services. Our company regularly seeks out and approaches new customers.
Exploitation: Our company strives to improve its expertise in utilizing available technology to increase productivity. Our company strives to improve competence in finding solutions to solve customer problems. Our company seeks to enhance existing expertise in product development. Our company strives to improve existing products/services. Our company regularly employs necessary minor adaptations of existing products and services. Our company promotes product/service enhancements to existing customers. Our company increases efficiency in the product/service delivery process. Our company expanded services to existing customers.
Construct: Dynamic Capability (source: Standard Chartered, 2020; Frank et al., 2017; Hung et al., 2010).
Our company has competitive flexibility in its industrial environment. Our company is capable of quickly identifying new business opportunities or potential threats that come up. Our bank leaders have entrepreneurial characteristics. Our company is capable of combining employee knowledge and vision.

End of Table 1

Construct: Dynamic Capability (source: Standard Chartered, 2020; Frank et al., 2017; Hung et al., 2010).
Our company is capable of evaluating the strengths and weaknesses of the organization. Our company is capable of knowing the right direction and time to conduct R&D. Our company helps employees balance work and family life.
Construct: Technological Capacity (source: Andrade et al., 2020; Kim & Rhee, 2009; Lember et al., 2018; Tsai & Hsieh, 2009).
Our company can utilize various technologies. Our company can develop products more effectively than other companies. Our company can develop systems in a more effective way than other companies. Our company can process in a more effective way than other companies. Our company has the knowledge capacity of new techniques. Our company can develop new technology. Our company has new technology investment capabilities.
Construct: Human Capital (source: Úbeda-García et al., 2018; Vidotto et al., 2017).
Our company employees are competent based on their position. Our company supports employee qualification improvement. Our company employees refer to the company code of ethics. Our company is oriented towards skill upgrading, including rigorous selection. Our company is skill-oriented with continuous training programs. Our company improves employee motivation (such as appropriate payroll systems and performance appraisals).
Construct: Organization Culture (source: Muhammad et al., 2021; Úbeda-García et al., 2018; Wang & Rafiq, 2014).
Our company respects everyone's different points of view. Our company values people from various backgrounds. Our company encourages all employees to come up with as many alternative solutions to every problem as possible. The future direction of our company is communicated to all employees. Every employee is aware of our company's long-term plans. Our company is confident in its business direction.
Construct: Environmental Dynamism (source: González-Benito et al., 2014; Jansen et al., 2006; Miller & Dröge, 1986; Mohammad, 2019; Simerly & Li, 2000; Soto-Acosta et al., 2018; Wang & Li, 2008.)
Our bank customers tend to seek out new products. Changes in customer demands and tastes. Technological changes affect products/services. Competitive competitor strategies and actions. Instability of changes in the environment outside the company. Unpredictable actions of competitors.

The SEM approach extends the multivariate analysis techniques of route analysis and multiple regression (Schumacker & Lomax, 2016). SEM has two analytical objectives: determining whether the model is plausible (reasonable or fit) and testing various hypotheses that have been built previously (Ghozali & Fuad, 2014).

The researchers used two different SEM approaches: CB-SEM and PLS-SEM. This study used the PLS-SEM approach with SMART-PLS software, which can handle small sample data. Previous research has been to use PLS_SEM with appropriate methods and applications (Chin, 2010; Henseler et al., 2016; Sarstedt et al., 2016). New guidelines were developed by combining PLS-SEM fundamentals with findings from recent improvements in PLS-SEM methodology (Hair et al., 2019b). The guidelines are based on four aspects of the structured PLS-SEM analysis process, namely: (1) research objectives, (2) measurement model specification, (3) structural model specification, and (4) evaluation results.

4. Results

Research questions in the fields of business and management benefit from quantitative data that may be directly applied to a situation (Frels & Onwuegbuzie, 2013). Saunders et al. (2019) said that quantitative data generally only expresses a narrow meaning if not processed and analyzed further. Data will have meaning and use after being analyzed and interpreted. The analysis technique will help realize the research's process and objectives. This research uses analysis programs such as SPSS and SMART-PLS to support the quantitative analysis process. Afterward, the model is created in SMART-PLS and run in the PLS Algorithm. This process is known as the measurement model/outer measurement model. In Table 2, all loading factors greater than 0.4 indicate that the indicators have reliability (Hair Jr et al., 2017b).

To be sure, it is not uncommon for social scientists to encounter situations where a loading factor of <0.7 is found, so special attention needs to be paid to eliminating indicators <0.7 if they do not affect composite reliability; they should not be eliminated when performing content validity of a construct (Hair Jr et al., 2017b). Loading factors of 0.4 to 0.7 are of particular concern when eliminating indicators, considering how much influence they have on composite reliability (or the average variance extracted),

Table 2. Results of the measurement (outer) model

Constructs	Items	Loadings	Cronbach's Alpha	CR	AVE
Organizational Ambidexterity	OA-XRA1	0.76	0.95	0.96	0.61
	OA-XRA2	0.83			
	OA-XRA3	0.78			
	OA-XRA4	0.84			
	OA-XRA5	0.82			
	OA-XRA6	0.79			
	OA-XRA8	0.80			
	OA-XTA1	0.85			
	OA-XTA2	0.84			
	OA-XTA3	0.83			
	OA-XTA4	0.82			
	OA-XTA5	0.92			
	OA-XTA6	0.80			
	OA-XTA7	0.83			
	OA-XTA8	0.78			

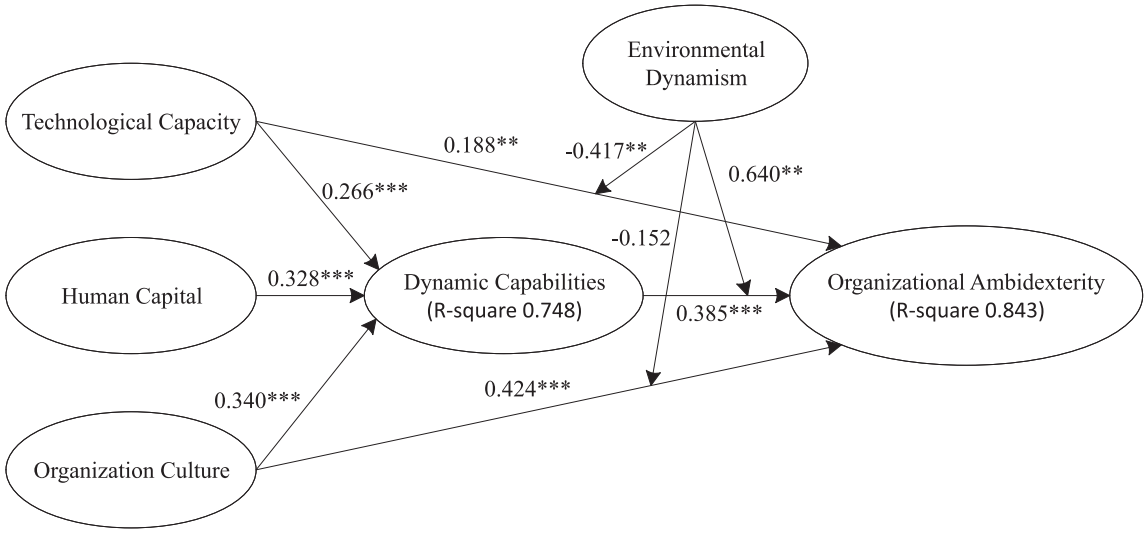
End of Table 2

Constructs	Items	Loadings	Cronbach's Alpha	CR	AVE
Dynamic Capability	D-CA1	0.73	0.92	0.94	0.68
	D-CA2	0.84			
	D-CA3	0.80			
	D-CA4	0.85			
	D-CA5	0.91			
	D-CA6	0.89			
	D-CA7	0.75			
Technological Capacity	T-CA1	0.86	0.90	0.92	0.63
	T-CA2	0.75			
	T-CA3	0.80			
	T-CA4	0.82			
	T-CA5	0.81			
	T-CA6	0.78			
	T-CA7	0.75			
Human Capital	H-CA1	0.75	0.91	0.93	0.70
	H-CA2	0.74			
	H-CA3	0.88			
	H-CA4	0.87			
	H-CA5	0.88			
	H-CA6	0.88			
Organization Culture	O-CU1	0.91	0.93	0.95	0.74
	O-CU2	0.93			
	O-CU3	0.88			
	O-CU4	0.88			
	O-CU5	0.76			
	O-CU6	0.80			
Environmental Dynamism	E-DY2	0.88	0.93	0.95	0.82
	E-DY3	0.94			
	E-DY4	0.93			
	E-DY5	0.88			

so loading factors <0.4 must be eliminated (Hair Jr et al., 2017b). In testing the measurement model, indicators ED1, ED6, and XPR 7 had to be eliminated because their loading factor was <0.4. The ED1 indicator relates to the question "Our bank customers tend to look for new products," and the indicator on ED6 whose question is "Competitors' actions are unpredictable." on the environmental dynamism construct. While the XPR7 indicator relates to the question "Our bank uses new distribution channels in marketing products/services" on the exploration construct (organizational ambidexterity).

Hair et al. (2019c) identified that Cronbach's Alpha value must be> 0.7, although a value of 0.6 is still allowed in exploratory research. Cronbach's Alpha values for all variables are > 0.70, as indicated in Table 2 of the research results. For internal reliability consistency to be demonstrated, the composite reliability must exceed 0.7 (Hair Jr et al., 2017b). If the value is >0.6, it is required in early-stage research, and composite reliability >0.7 is required to build the construct. In Table 2, all variables have composite reliability values > 0.7. An AVE value of 0.5 or higher indicates that the average construct explains more than half of the variance of its indicators (Hair et al., 2017a, p. 115; Hair et al., 2019a, p. 676). Table 2 shows that all variables have AVE> 0.5, except for the environmental dynamism variable and the moderation variable. Discriminant validity is achieved if the AVE of each construct is greater than the bivariate correlation with other constructs and if the loading factor is higher when each construct is compared with other indicators (Hair et al., 2019a, p. 677). Discriminant validity testing can be done by assessing with traditional methods: cross-loading and Fornell-Larcker criteria (Fornell & Larcker, 1981).

Discriminant validity, measure reliability, item loadings, and convergent validity can then be used to evaluate the



Notes: **p<0.05, ***p<0.01.

Figure 2. Results of the structural model

Table 3. Assessment of discriminant validity via the criterion

	1	2	3	4	5	6	7	8	9	10	11
1. D-CA*E-DY	1.000										
2. D-CA	–0.614	0.827									
3. E-DY	–0.791	0.569	0.907								
4. Exploitation	–0.553	0.854	0.539	0.835							
5. Exploration	–0.624	0.772	0.543	0.817	0.804						
6. H-CA	–0.671	0.819	0.518	0.735	0.759	0.834					
7. O-CU*E-DY	0.990	–0.602	–0.744	–0.546	–0.648	–0.678	1.000				
8. OA	–0.614	0.858	0.567	0.963	0.942	0.783	–0.622	0.781			
9. O-CU	–0.757	0.822	0.609	0.795	0.808	0.879	–0.753	0.841	0.862		
10. T-CA*E-DY	0.995	–0.609	–0.767	–0.552	–0.643	–0.669	0.993	–0.622	–0.751	1.000	
11. T-CA	–0.569	0.750	0.530	0.684	0.763	0.721	–0.557	0.754	0.728	–0.554	0.795

measurement model. Its reliability is proven if an item's loading is more significant than 0.70. To test for convergent validity, statisticians utilize the AVE to be at least 0.5 over the standard level (Fornell & Larcker, 1981). Fornell-Larcker Criterion can be seen in Table 3 as follows:

After ensuring that the measurement model is valid and reliable, the next step is to evaluate the outcomes of the SMART-PLS output structural model test. This test includes model significance, predictive capabilities, and relationships between constructs. The assessment steps of the structure model referencing validation are as follows (Hair et al., 2017a).

Then, the 5000 two-tails bootstrap procedure was applied at a significant level of 95 percent. If the t-statistics value is greater than the critical value (1.96) and the p-value < 0.05, the statistical significance of the hypothesis is accepted (Hair et al., 2019c).

This research result, which gives the main implication, is that technological capacity, organizational culture, and dynamic capability contribute to achieving organizational ambidexterity. Organizational ambidexterity theory helps identify and plan the right strategy in the company, which is more towards exploitation or exploration to achieve company performance. In more detail, which constructs and indicators dominate from exploration and exploitation activities to focus on planning the strategy.

Moreover, no less important is that technological capacity harms the achievement of organizational ambidexterity when moderated by environmental dynamism. This phenomenon can be attributed to the tendency of banks, particularly in Indonesia, to employ well-established technology instead of adapting to changing environmental conditions, which entails greater risk. This finding makes it a novelty that this study describes that banks in Indonesia are more inclined towards exploitation to achieve organizational ambidexterity when environmental dynamism is turbulent.

The research model that has been developed can be a benchmark or reference for further research and can sharpen or focus more on one of the constructs following the research problems that arise. Indicators and constructs that dominantly play a role in achieving Organizational Ambidexterity are of concern to practitioners in making policies. The banking community will benefit from the right policy. Furthermore, certain corporate communities beyond the banking sector can gain valuable insights and knowledge on the discourse surrounding organizational ambidexterity.

Table 4. Hypothesizes testing

Hypothesis	Path Coefficient	T-statistics	p-Values	Results
H1: Technological Capacity → Organizational Ambidexterity	0.188	2.048	0.041	Accepted
H2: Technological Capacity → Dynamic Capability	0.266	3.160	0.002	Accepted
H3: Human Capital → Dynamic Capability	0.328	2.493	0.013	Accepted
H4: Organization Culture → Dynamic Capability	0.340	2.699	0.007	Accepted
H5: Organization Culture → Organizational Ambidexterity	0.424	3.292	0.001	Accepted
H6: Dynamic Capability → Organizational Ambidexterity	0.385	3.066	0.002	Accepted
H7: Environmental Dynamism*Technological Capacity → Organizational Ambidexterity	–0.417	2.020	0.043	Accepted
H8: Environmental Dynamism*Organization Culture → Organizational Ambidexterity	–0.152	0.818	0.414	Reject
H9: Environmental Dynamism*Dynamic Capability → Organizational Ambidexterity	0.640	2.285	0.022	Accepted

5. Discussion and conclusions

After analyzing and processing data using the SEM method and involving SMART-PLS Software, the hypothesis results are obtained, which will be discussed for each hypothesis in this section. The entire hypothesis relating to the research question can be seen in Figure 2 and Table 4.

Hypothesis 1 of the effect of technological capacity on organizational ambidexterity is accepted. Research on Portuguese SMEs supports this idea, showing that T-CA considerably benefits OA. Exploration alone; exploitation had no statistically significant effect (Andrade et al., 2020). Likewise, research (Soto-Acosta et al., 2018) on Spanish SMEs in the manufacturing industry demonstrates the favorable correlation between technological capability and business ambidexterity. Both studies conducted on SMEs turned out to have the same results when applied to large companies such as banks so that they can be used as a new reference for the relationship between technology and corporate ambidexterity of both small and large companies. Balancing exploitative and experimental activity may be difficult for the banking industry. The role of technology is expected to add new parameters in achieving ambidextrous commercial banks.

Hypothesis 2 tests T-CA's effect on dynamic capability, and the results are accepted. Information technology is essential for organizational agility for monitoring, assistance, education, connectivity, and rearrangement (Mikalef & Pateli, 2017; Weill et al., 2002). Companies with solid information technology-based sensing capabilities will be better equipped to adapt to and, due to the execution of specialized marketing strategies, capitalize on the market (Mikalef & Pateli, 2017). Dynamic capabilities, of which technological capability is a part, are essential for achieving sustainable competitiveness and boosting business innovation (Valdez-Juárez & Castillo-Vergara, 2021). The relationship between human capital and dynamic capability has attracted previous research attention. Although the relationship between these two constructs has been conducted in the hospitality sector (Nieves & Haller, 2014), chief information officers (Mikalef et al., 2019), various industries (Mikalef et al., 2020), high-tech industry (Hsu & Wang, 2012), Iraqi commercial banks (Ali et al., 2021), This research demonstrates the banks' dynamic capabilities by emphasizing the importance of adaptability. Mikalef and Pateli (2017), which states that dynamic capability affects performance by increasing process flexibility and cost efficiency. Dynamic capability relies on organizational flexibility that may be allowed or denied by the chosen business model (Teece, 2018). The bank applies the dynamic capability theory through its ability to detect, absorb, integrate, and innovate, allowing it to maintain its sustainability (Gallego-Gomez & De-Pablos-Heredero, 2020). The bank can implement artificial intelligence to develop a more innovative business model (Gallego-Gomez & De-Pablos-Heredero, 2020). In addition, the bank's dynamic capability is also carried out by allocating resources to improve competencies. Studies at the Royal Bank of Scotland and Caixa Bank show that the proper application of Artificial Intelligence (AI) enables the reconfiguration of traditional banking scenarios through detection, absorption, integration, and innovation to become more dynamic (Gallego-Gomez & De-Pablos-Heredero, 2020). Dynamic capabilities can facilitate the process of technology adoption and transformation (Konlechner et al., 2018). Research across industries, like that of Farzaneh et al. (2022) on pharmaceutical firms in Iran, demonstrates that a company's dynamic capability has a significant impact on its adaptability. Ali et al. (2021) stated that commercial banks' dynamic capabilities factors of sensing, seizing, and reconfiguring as essential factors of intellectual capital components and innovation performance.

The result of testing hypothesis 3, the effect of H-CA on D-CA, is accepted. This hypothesis answers the research question, "Does human capital affect the dynamic capability of commercial banks in Indonesia?" because qualified human capital capabilities follow banks as financial institutions that already use technology in operations. Companies with high levels of dynamic capability are those in which human capital plays an increasingly important role. Research on Iraqi commercial banks supports this idea, finding that a innovation performance is influenced by intellectual capital, including the function of human capital, to varying degrees, depending on its dynamic capability (Ali et al., 2021). The study conducted on hi-tech companies in Taiwan shows that human capital positively influences dynamic capability (Hsu & Wang, 2012). The study (Farzaneh et al., 2022) likewise indicates a favorable correlation between human capital and dynamic skills, this time in an analysis of 200 pharmaceutical firms in Iran.

Hypothesis 4 is to test the effect of O-CU on D-CA. The analysis's findings showed that the hypothesis is accepted. Likewise, it indicates a favorable correlation between human capital and dynamic skills in the context of an analysis of 200 pharmaceutical firms in Iran. The outcomes of this hypothesis align with previous research that reviews organizational learning culture contributes positively to dynamic capability in the high-tech industry in Taiwan (Hung et al., 2010). In comparison, Chow (2012) examines the foreign direct investment sector by breaking culture into three dimensions: competitive culture, supportive culture, and formalization or bureaucratic culture. This study corroborates previous arguments that ambidextrous organizational culture (AOC) should be based on two sets of organizational values and norms, organizational diversity and shared vision, starting from the duality of organizational culture mentioned above to achieve control and flexibility (Rink & Ellemers, 2007; Wang & Rafiq, 2014).

Hypothesis 5 is to test the effect of O-CU on OA. The outcomes of this hypothesis reinforce research on banks in Spain, which concluded that organizational culture significantly affects ambidexterity (Cegarra-Navarro et al., 2021). Studies on technology companies in the United Kingdom and China show the same results. Namely, organizational culture positively correlates with the company's ambidexterity (Wang & Rafiq, 2014). Next, this hypothesis

is consistent with the premise of previous research that ambidextrous organizational culture has a positive and significant effect on contextual ambidexterity, where contextual ambidexterity functions as a mediator of product innovation (Khan & Mir, 2019; Muhammad et al., 2021). It is in line with previous research, which states that organizational culture through contextual ambidexterity will improve company performance positively and significantly in small and medium enterprises in Indonesia (Ikhsan et al., 2017). Research in Taiwan came to a similar conclusion, finding a link between a culture of sharing information and an openness to new ideas (Lin & McDonough, 2011). A Study by Felipe et al. (2017) of 172 Spanish companies shows that organizational culture is one of the antecedents influencing organizational ambidexterity. Indicators of organizational culture in the bank, such as respect for different points of view, respect for diversity, employee involvement, vertical communication, and employees understanding the company's decisions, lead the company to create a situation that supports the achievement of ambidextrous commercial banks. The company together synergizes to uphold the culture toward achieving mutual prosperity.

Hypothesis 6 tests the effect of D-CA on OA, and the results are accepted. This study's results align with research on extensive data analytics capabilities that measure human skills and positively influence incremental and radical innovation capabilities, which are mediated by dynamic capabilities (Mikalef et al., 2020). Human capital is a component of intellectual capital. The results of previous studies that tested dynamic capability in the high-tech sector also showed a significant contribution to organizational performance (Hung et al., 2010). Subsequently, Božič and Dimovski (2019) research on small and large companies in Slovenia demonstrates that adapting to new knowledge enhances ambidexterity. Then, the study by Farzaneh et al. (2022) regarding Iranian pharmaceutical firms shows that dynamic capability influences firm ambidexterity. In its operations, the bank can use innovative ways to meet customer demands by accepting new technologies and practices (Imran et al., 2021). Technological change triggers the process of innovation and reconfiguration in the company. To deal with the environment's dynamism, the company must respond to the pressure of continuity, complexity, and dynamics to remain competitive. Dynamic capabilities can facilitate the process of technology adoption and transformation (Konlechner et al., 2018). The implications of the hypothesis can be used as a reference that dynamic capability can mediate aspects of technology used to achieve organizational ambidexterity. In the traditional resource-based view, the goal is to focus on internal organizational mechanisms, but dynamic capabilities are influenced by external factors, and dynamic capabilities affect organizational ambidexterity (Farzaneh et al., 2022; Felipe et al., 2017).

Hypothesis 7 tested outcomes accepting E-DY environmental dynamism's role in moderating the correlation between T-CA and OA. This hypothesis contradicts the study's findings by Andrade et al. (2020), which state that the moderating influence of environmental dynamism has a favorable impact on the connection between T-CA and OA. Although the moderation hypothesis results differ, technological capacity's direct effect on organizational ambidexterity is positive (Soto-Acosta et al., 2018). It is a manifestation that the technological capacity of banks is needed in their efforts to transform into digital banks. On the other hand, the dynamic environment in the banking industry will weaken the process of absorbing technological capacity. The environment is dynamic; product cycles are shortened, new products are introduced, information interchange is accelerated, and the company's strategic decisions are being driven at the time.

Furthermore, as a result, companies are increasingly tricky to (1) assimilate and anticipate the environment, (2) identify the impact of new technological changes, and (3) translate into specific and targeted actions and decisions (Tajeddini & Mueller, 2018). It could be that the technological capacity of banks has a negative impact if the environmental conditions are very dynamic. Readiness and existing technology will be the cornerstone in achieving organizational ambidexterity. In other words, if banks grow their technological capacity in a volatile environment, the security risk of the technology will also increase. Although some researchers believe ambidexterity is more valued in environmental dynamism (Wang & Li, 2008), others argue that under dynamic environments, companies cannot adequately predict changes in technology, future earnings, or investment requirements (Schilke, 2014). Four indicators of environmental dynamism, namely changing tastes, technology, more competitive competitor strategies (such as fintech and super apps), and the COVID-19 pandemic, weaken the influence of technological capacity on organizational ambidexterity. Banks are also facing disruption of savings and financial account numbers due to fintech practices, with services such as mobile money accounts, utility bill payments, use of mobile phones, and the internet to access financial institution accounts and digital payments (Parameshwar et al., 2019). In banking, continuously innovating in handling and managing customers by adopting new technologies is essential for achieving higher performance (Imran et al., 2021).

Hypothesis 8 to be tested is the effect of E-DY in moderating the relationship between O-CU and OA. The results are rejected. It means that environmental dynamism does not moderate the relationship between organizational culture and organizational ambidexterity. This hypothesis's findings align with research in India, stating that environmental dynamism deteriorates the relationship's moderating effect between ambidextrous organizational culture and contextual ambidexterity (Khan & Mir, 2019). The rapid changes in the market and intense business competition make things difficult for organizations, so they have every chance of falling behind by not keeping up with the trends in their external environment (Albright, 2004; Khan & Mir, 2019). However, an organization's culture might facilitate the development of both exploration

and exploitation simultaneously. Organizational culture influences how companies respond to external events and make strategic choices (Liu et al., 2010). In an environment that encourages and supports innovative ideas, employees can discover new ways of doing things (Dombrowski et al., 2007; Imran et al., 2021). Such a culture improves the organization's performance on routine tasks and encourages its employees to take the initiative (Khan & Mir, 2019).

Hypothesis 9 to be tested is the effect of E-DY in moderating the relationship between D-CA and organizational ambidexterity. The results are accepted.

This idea validates past findings that, as environmental dynamism grows, dynamic capability becomes increasingly important. Furthermore, the dynamic capability is helpful for exploitation and exploration (Frank et al., 2017). The firm's dynamic capability is considered adequate at moderate levels of environmental dynamism. It will contribute to exploiting existing knowledge, so environmental dynamism challenges exploitation and exploration activities (Wamba et al., 2020). Commercial banks are defined by the value of control, which results in strict operational regulations, highly structured communication channels, and limited capacity for innovation performance. Since the flexibility of banks is limited by prudent banking, dynamic capabilities are needed (Ali et al., 2021; Choi et al., 2018).

6. Theoretical and managerial implications

The findings of this investigation contribute to the body of academic literature in multiple respects. Initially, empirical support was obtained to substantiate the hypothesis that operational organizational ambidexterity can be developed in the banking industry, distinct from the other sectors, so that ambidexterity within the banking industry guarantees continuous dynamic by striving for a state of synchronization between exploitation and exploration. This study provides some significant avenues for theoretical contributions. This study addresses the challenge by examining the relationship between organizational culture and ambidexterity. Additionally, it offers a fresh perspective on the moderating influence of environmental dynamism. First, it empirically connects research on the outcomes of organizational ambidexterity, answering the call for additional research in the context of banking ambidexterity (Kafetzopoulos et al., 2023). Conversely, alternative studies indicate that environmental dynamism adversely influences the correlation between contextual ambidexterity and new product innovation outcomes, as well as between ambidextrous organizational culture and contextual ambidexterity (Khan & Mir, 2019). Organizational tensions negatively correlate with the moderating effect of the relationship between environmental dynamism and organizational ambidexterity (Peng & Lin, 2019).

This study will add to the theoretical component by enhancing the hypothesis that human resource management, technological capacity, organizational culture, and dynamic capabilities play a crucial role in organizational ambidexterity. This study also anticipates contributing to past research by demonstrating that environmental dynamism moderates explorative and exploitative effectiveness impacted by technological capacity, dynamic capability, and organizational culture. The findings of this study provide an overview of how human capital, technological capacity, organizational culture, and dynamic capabilities of banks affect organizational ambidexterity in the banking sector in environmental dynamism. The inquiry outcomes are consistent with the use of PLS-SEM, which is designed to promote model exploration and theory development (Ringle et al., 2018).

Organizational culture is the construct that has the most significant influence on organizational ambidexterity in the banking sector. It shows that organizational culture in banks has the most significant contribution to achieving ambidextrous commercial banks, especially in Indonesia. This finding proves that organizational culture should be of particular concern compared to other antecedents when seeking organizational ambidexterity. Banks should develop and implement a set of beliefs and values conducive to exploiting knowledge, encouraging and rewarding innovative behavior and innovation, and a climate of openness, enabling the adoption of new ideas and critical reflection. Although previous studies have proven human capital in banks to performance (Cabrita & Bontis, 2008; Mention & Bontis, 2013; Ousama et al., 2020; Tran & Vo, 2020), human capital on ambidexterity (De La Latra et al., 2016; Mubarik et al., 2019), human capital measurement scale (Vidotto et al., 2017) and corporate innovation (Tseng et al., 2014). This research builds the concept of the relationship between human capital through the technological capacity to organizational ambidexterity by integrating Resource Based Theory.

Likewise, technological capacity is more dominant in the direct influence on organizational ambidexterity than the indirect influence through dynamic capabilities. This study's results align with the research of Andrade et al. (2020) on contingency theory and dynamic capability theory. Both theories show how skills and the external environment are instrumental to exploitation and exploration activities. In highly dynamic environments, organizational ambidexterity is driven more by banks' dynamic capabilities. Organizational culture has a more dominant direct influence on organizational ambidexterity than the indirect influence through dynamic capability. This finding demonstrates that organizational culture is better suited for implementation in the banking sector since the bank leaders who participated in this study serve as motivational role models for organizational culture. The study's conclusions are consistent with previous research of Úbeda-García et al. (2018) from the shared vision dimension that refers to organizational learning theory. Organizational learning theory defines organizational behavior as generating information and minimizing uncertainty (Sullivan & Nonaka, 1986).

The construct that has the most significant influence on organizational ambidexterity is dynamic capability in the banking sector. Ali et al. (2021) argued that intellectual

capital, including human capital, cannot guarantee innovation performance without commercial banks' dynamic capacity aspects of sensing, capturing, and reconfiguring. In contrast, technological capacity in the banking industry has the most negligible impact on organizational ambidexterity. This study shows results that are controversial to research by Andrade et al. (2020) related to the moderating role of environmental dynamism that weakens the influence of technological capacity on organizational ambidexterity.

Companies with solid information technology-based sensing capabilities will be better equipped to adapt to generating profit from the market due to the application of targeted (Mikalef & Pateli, 2017). Organizations that can absorb technology internally and externally will benefit from the technology supply (González-Moreno et al., 2019; Valdez-Juárez & Castillo-Vergara, 2021). The organization reconfigures current capabilities and creates and updates other capabilities through dynamic capabilities (Jantunen et al., 2018; Patrício et al., 2021).

An organization that can seize opportunities, change its management system, introduce cutting-edge technology, and innovate can only achieve a competitive advantage (Feng et al., 2020; Sutopo et al., 2019).

Based on the literature review, previous research and practices in the banking environment can be a reference for management in developing human resources to encourage technological capacity and organizational culture. This study develops insights for management to consider culture and human capital as critical internal strategic management to enhance dynamic capabilities. This research is also expected to provide benefits and various managerial implications regarding how organizational units successfully overcome various pressures from the external environment. The outcomes of this investigation also support Bank Indonesia's policy to maximize digital transactions. In addition, this research can serve as a reference for the Ministry of Manpower and Transmigration to develop technology-oriented employee standardization. Environmental dynamism has disrupted business systems such as the banking industry in Indonesia. Market demand has shifted, requiring banking management to think hard about finding the right solution to maintain the company's sustainability. Pandemic engagement can shift and force new business behaviors and ways of life. The limitation of being able to interact physically encourages business people to involve technology to cover these limitations. Since technology is the most relevant tool in this pandemic, utilizing the internet network and applications can be a solution and option for interacting during a pandemic. Companies with distinctive human capital and solid technological capabilities should lead business problem resolution. In the banking sector, innovation-related adaptability is vital for banks to be flexible in adapting to changes in regulation or technology (Imran et al., 2021).

Most banks in Indonesia support digital financial services to meet customer demand. Thus, digital transformation is the solution for banks to retain their company. In the last two years, Indonesian banking has experienced significant changes from traditional banking to modern banking due to the pandemic. The results of this study indicate that T-CA has not succeeded in showing effectiveness regarding process capacity. There has been a shift in the role of banks from operators to facilitators, so banks need to sort out transactional activities (utilization of technology) into relational (face-to-face) (Dasgupta, 2019). Investments in new technologies are linked to more excellent compensation for employees to obtain more specialized and qualified human resources (Ballestar et al., 2022). Dasgupta (2019) opined that banks need to transform their technology through digital banking transactions and collaborations/partnerships in the face of volatility. At moderate environmental dynamism, the dynamic capability is quite adequate, which depends on utilizing existing knowledge.

In contrast, high environmental dynamism allows businesses to develop prospecting and extraction skills (Wamba et al., 2020). This study reveals that environmental dynamism strengthens dynamic capabilities that affect organizational ambidexterity. Most banks in Indonesia support digital financial services to meet customer demand. Focus on employee training to develop a continuous collective learning environment and build managerial competencies (Dasgupta, 2019).

7. Limitations and future research

Based on the research findings, it can be a reference for further research and recommendations to the banking sector. The findings of this study provide some suggestions for future researchers and organizational ambidexterity research related to antecedents related to technology adoption, technology use, and technology use risk. This study is anticipated to shed additional light on the significance of technology in the financial sector. The following recommendations are offered for banks in light of the findings of this study.

First, there is a gap in employee competencies. The Bank must enhance its human resource skills by enhancing working conditions and fostering professional connections (Ballestar et al., 2022). Similar to the research in Vietnam, banks must recruit premium talented human resources (Khue Ngo et al., 2022). Because of the investment made to increase the capability of new technologies, qualified resources are required. Professionalism refers to human resources that are specialized and of good quality. This level of professionalism is also associated with higher compensation. Even though banks have provided product/service services through online and offline channels, the human touch is still needed (Dasgupta, 2019).

Second, financial institutions must monitor the advances of fintech, super applications, and other asymmetric competitors to remain competitive. Banks must explore various information available in the outer environment (Ganotakis et al., 2021). The dynamic environment forces banks to respond quickly to customer needs and keep up

with changing tastes. There has been a shift from managing customer transactions to educating and advising customers (Dasgupta, 2019).

Third, banks need to develop strategic alliances by collaborating with fintech and super apps that can improve the quality of products/services to maintain bank business continuity. Fourth, banks need to innovate. A case study of banks in Vietnam recommends that banks have management innovation capabilities: (1) strategy, (2) resources, and (3) technology (Khue Ngo et al., 2022).

Fifth, banks must improve risk mitigation due to technological and operational impacts (Khue Ngo et al., 2022). Banks must understand that information and business intelligence systems can maximize information and knowledge to be applied within the company, which can then be used in decision-making (Cepeda-Carrión et al., 2015).

Declaration of competing interest

The authors state that they have no known competing financial interests or personal ties that could be perceived as having influenced the work described in this study.

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