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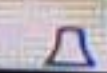
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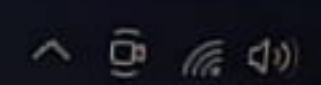
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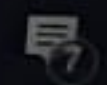
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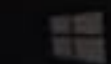
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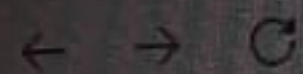


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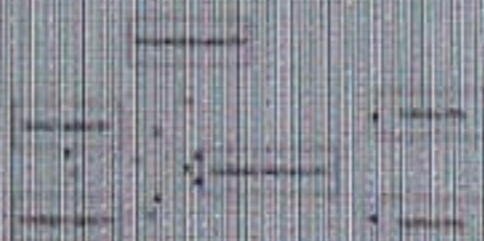


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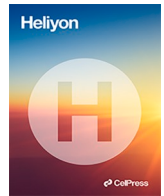
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## Research article

# Organizational ambidexterity: The role of technological capacity and dynamic capabilities in the face of environmental dynamism

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## ABSTRACT

Organizational ambidexterity has been widely established as necessary for economic sustainability in the financial services sector. Organizational ambidexterity is an organization's ability to be aligned and efficient in management to meet business needs while simultaneously adapting to environmental changes. To meet the challenges of the new digital economy, banking organizations require substantial technological changes and must also recognize that the banking business itself is one of technology. Organizational ambidexterity is essential for financial sector businesses, but their relationship and relative merits are unclear. This research focuses on the role of technological capacity and dynamic capability of the banking sector in Indonesia in an effort to achieve organizational ambidexterity in the face of a dynamic environment. This research uses quantitative methods by surveying leaders from Indonesian commercial banks and analyzed using the SMART PLS program. Our investigation found that technological capacity influences organizational Ambidexterity, with the link becoming stronger when mediated by an organization's dynamic capability. In the meantime, environmental dynamism has no impact on the organizational ambidexterity of the banking sector in Indonesia. Our findings also indicate that the associated security risk will increase if a bank improves its technological capacity in a highly dynamic environment. This paper is an empirical study of technological capacity and presents a method for creating organizational ambidexterity through dynamic capability, especially in the banking sector.

## 1. Introduction

The interrelatedness between organizational ambidexterity, open innovation, and the micro-foundations of dynamic capabilities has only been partly researched within the literature [1]. Recently, many researchers have raised the topic of organizational ambidexterity as important in the success of companies [2]. Organizational ambidexterity is the organization's ability to be coordinated and efficient in management to satisfy business goals while also being able to adapt to environmental changes [3]. The antecedents that drive or become ambidextrous actors still need to be studied continuously to understand the mechanisms, dynamics, and variables of how companies actually achieve ambidexterity [4]. A critical research subject is the antecedent theory of organizational

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ambidexterity, which analyzes ways of concurrently pursuing exploration and exploitation [5]. Meeting the sustainability challenge also requires incumbents to transform their activities. Such transformation, however, must be conducted while maintaining its operations and customer satisfaction. Organizational ambidexterity is essential for financial sector businesses, but their relationship and relative merits are unclear [6].

In comparison, state-owned commercial banks have the lowest cost efficiency and operate with the least amount of technology, which is negatively related to fintech [7]. Fintech not only improves the cost-effectiveness of banks but also multiplies their technological utilization [7]. In this situation, the function of banking technology discovery and exploitation is crucial to addressing future business issues. Looking at the expansion of current banking innovations demonstrates that financial innovation may enhance the diversity of banking services, strengthen the capacity to share bank risks, and improve resource allocation efficiency [7]. Banks are quickly modernizing and expanding their services in the banking sector by incorporating new technology to speed service delivery, enhance service quality, and provide clients with individualized experiences [8]. Innovation, detection, adaptation, absorption, and integration are capabilities that allow reaching, in most cases, the managerial skills oriented to save costs, increase efficiency and achieve more competitiveness [9]. Dynamic capability cannot directly affect banking performance in the short term, but it may be a bridge to ambidexterity and firm performance [10]. When market rivalry intensifies and gets more complicated, the complexity of technology likewise increases, and organizations can no longer rely on their existing technology and capabilities to improve their services [11]. Technological innovation drives the development of technically and economically viable products [12]. Companies that can penetrate the world's technical frontiers and access cutting-edge technology are productive and contribute to higher performance [13,14]. Companies must aggressively seek new chances to exploit and improve technological capabilities to deal with the current essential environmental circumstances [15]. In times of extreme volatility and uncertainty, organizations must build organizational capability to manage unforeseen events successfully [16].

The banking sector has encountered challenges recently due to innovative business models such as fintech and super apps. The dynamics of the Covid-19 pandemic have also colored the challenges in the banking sector because it directly affects the company's human capital policies due to changes in how employees work. The banking sector is a context of organizational ambidexterity because of its nature, size, and importance, but also because of the regulatory constraints it faces regarding the scope of its mission, all of which affect the pursuit of new opportunities [17]. While the topic of ambidexterity has been used as a strategy, the turbulent environment that impacts ambidexterity in emerging countries remains under-researched [18]. Furthermore, a solid and efficient banking system is critical to a country's macroeconomic stability [19]. Commercial banks in Indonesia need to be ambidextrous to exist, operate well, and maintain sustainability.

In light of the absence of empirical studies on ambidextrous commercial banks in Indonesia, this article seeks to investigate these interactions by employing technological capacity and dynamic capabilities in the face of environmental dynamism. The remaining sections of this paper are structured as follows. In order to achieve ambidexterity in the context of developing countries, we will first review the pertinent literature in the areas of technological capacity, dynamic capabilities, and environmental dynamism.

Given the absence of empirical studies on ambidextrous commercial banks in Indonesia, this study will investigate the interaction of variables and the foundation for organizational ambidexterity. What if this hypothesis is applied to the banking sector in the dynamics of the environment, especially in Indonesia. Studies on technological capacity in companies are still rarely carried out in developing countries, so this research topic is important to be researched.

Second, studies conducted by several previous researchers show that companies that access innovations and technologies from a dynamic capability point of view affect ambidexterity [20]. This study will discuss the role of technological capacity from the point of view of dynamic capabilities in environmental dynamism.

Third, driving processes, practices, and routines that can create the capacity to organize and combine exploration and exploitation from an individual level and a tiered framework can provide unique insights into how ambidexterity as a dynamic capability at an organizational level can be built. We want to look at the dynamic capability perspective as an essential component of organizational ambidexterity in the banking sector, especially in Indonesia. To answer the research questions posed, this study is organized as follows. It starts with an overview of the relevant literature and discusses the main topics. After this theoretical section, the research methodology is described, and hypotheses are formulated, followed by a discussion of the results obtained. The study concludes with contributions and suggestions for future research.

## 2. Literature review

With increasingly complex and rapid environmental changes, dynamic capabilities have become a winning strategy for companies to acquire a competitive advantage [21]. Along these lines, O'Reilly & Tushman [22] state that dynamic capabilities reflect organizational skills manifested in top management decision-making and allow the exploitation of current abilities and the development of future abilities. Therefore, ambidexterity is a valuable complement to the dynamic capabilities perspective because it clarifies the strengths and weaknesses of management decisions around finding and benefiting from opportunities and reconfiguring internal activities [23]. Ambidexterity has been defined as an organization's ability to simultaneously pursue exploratory and exploitative activities [24,25] and manifests itself in firms' ability to form a balance between opportunity-seeking (i.e., exploration), and advantage-seeking (i.e., exploitation) activities [26].

Organizational ambidexterity refers to an organization's capacity to both explore and exploit in order to compete in mature technologies and markets where efficiency, control, and incremental improvement are valued, as well as in new technologies and markets where flexibility, autonomy, and experimentation are required [27]. Contextual ambidexterity is highly relevant for new product invention and organizational success, especially in dynamically operating high-tech companies [28]. Ambidextrous

organizations need a dynamic capability that allows them to mobilize, coordinate, and integrate distributed conflicting efforts, as well as to allocate, reallocate, combine, and recombine resources and assets across dispersed exploratory and exploitative units [29,30]. Successful businesses must be capable of blending exploratory and exploitative energies to become ambidextrous [31]. The importance of technology in an organization's day-to-day operations significantly impacts its viability [32]. The significance of technology in the banking industry suggests that it is cost-effective [33]. Technology, such as information and communications technology (ICT), has a positive effect on banking performance and improves the financial stability of the banking industry by deploying technology more broadly (e.g., IT and financial technology) [34].

### 2.1. Technological capacity (TC) and organizational ambidexterity (OA)

Companies and organizations have a technological capacity based on their technical knowledge. A high technological capacity indicates the ability to develop and enrich technology, which enables businesses and organizations to cultivate ideas and solutions for their products and services [11]. The capability to acquire new external technologies is called technological capacity [35]. Absorptive capacity refers to a company's ability to perceive the value of further external information, comprehend it, and economically utilize it [15]. Moreover, Parrilli et al. [36] argue that technological capacity generates science and technology-based innovation.

Therefore, technological capacity and absorptive capacity are tightly connected. Technological capacity is the ability to research, develop, and adopt new technical solutions in service design, delivery, and evaluation [32]. To succeed with a digital business model, organizations need access to cutting-edge technology and technological capacity [37]. Human resource development relies heavily on introducing novel technologies and expanding technological capacity [38].

Technological capacity is a company's capability to deploy new technical and scientific information, creative technological processes, and understanding of current technologies to meet the difficulties of a competitive environment [39,40]. Technological capacity facilitates the organization's recovery from commercial disruptions caused by the COVID-19 pandemic, and technology can boost company resilience [41]. In addition, this skill enables the organization to generate science and technology in engineering tasks [40].

It is not simple to evaluate the technological capacity of an industry and its linked worldwide technological boundaries [42]. To satisfy the demands of the new digital economy, banking institutions must make significant technical changes. The bank's leadership team must also acknowledge that the bank's business is a technology [43].

High ambidextrous organizations are able to achieve breakthrough innovation while also making steady improvements to an existing business [44]. Building technological capacity enables companies to effectively integrate and combine external technological knowledge (exploration) with existing knowledge (exploitation) to generate better new product sales [11]. Companies with robust technological absorptive capacity can have a better ability to achieve organizational ambidexterity, while insufficient technological absorptive capacity is an obstacle to being better at technological knowledge and organizational ambidexterity [45]. The competition of technological and market capabilities where efficiency, control, and incremental improvement are the values, as well as the competition of new technologies and markets where flexibility, autonomy, and experimentation are the needs are the path to organizational ambidexterity [46]. In general, technological capacity can be an instrument in achieving organizational ambidexterity. We can make our initial hypothesis concerning organizational ambidexterity based on this evidence.

**H1.** Technological capacity has a significant effect on organizational ambidexterity.

### 2.2. Technological capacity (TC), dynamic capability (DC), and organizational ambidexterity (OA)

Organizations with core competence can integrate technologies and add varied production skills [47]. The supply of technology will benefit organizations capable of assimilating it internally and externally, and these organizations will gain from it [48,49]. Through dynamic capabilities, organizations reconfigure present capabilities and generate and upgrade other capabilities [50,51]. Companies can only acquire a competitive advantage if they can seize opportunities, adjust their management techniques, apply cutting-edge technology, and continue to innovate [52,53].

Exploitation operations, reconfiguration of existing resources, and exploration via creating new resources and their combinations are all part of developing and implementing dynamic capabilities [54]. The proposed underlying processes that comprise dynamic capabilities based on the definitions mentioned earlier and past empirical studies include (i) sensing, (ii) coordinating, (iii) learning, (iv) integrating, and (v) reconfiguring. These routines are posited as enablers of operational capability renewal [55]. A sensing capability is defined as the ability to spot, interpret, and pursue opportunities in the environment. It is perceived as imperative for firms to gather market intelligence on market needs, competitor moves, and new technologies to proactively reposition their strategic offerings [56].

Dynamic capabilities enabled by IT to realize organizational agility can be realized in conditions ranging from relatively stable to highly uncertain environments. It validates the argument that dynamic capabilities can operate in conditions without turbulence [55]. Technological capacity is a company's ability to design and develop new processes and products, improve knowledge and human capital skills, and transform knowledge into high-added inputs (products and services) to increase organizational performance [49]. A network that explores and exploits processes learned or adopted from other firms in the form of technology motivation and adoption presents a further differentiation of the dynamic capability view and is related to the innovation and ambidexterity research streams [57,58]. Accordingly, Rothaermel and Deeds [58] indicated this concept as "a dynamic capability by which organizations mobilize, coordinate, and integrate dispersed contradictory efforts, and allocate, combine and recombine resources and assets across



differentiated exploration and exploitation units” [59]. From the references above, the following hypothesis can be hypothesized.

- H2.** Technological capacity has a significant impact on the dynamic capability
- H3.** Dynamic capability has a significant effect on organizational ambidexterity
- H4.** The effect of technological capacity on organizational ambidexterity is mediated by dynamic capability

### 2.3. Environmental dynamism (ED) and organizational ambidexterity (OA)

Environmental dynamism is a situation of instability and unpredictability in the external business environment, defined by various technologies, clients, and commodities demands [40,60–62]. Environmental dynamism can also generate uncertainties in technological capacity and environments where competitive advantage is frequently temporary [63]. Technological capacity can generally improve a company’s ability to respond to shocks and recover once an aggregate shock occurs (for example, after the Covid-19 pandemic) [41]. The direct effect relationship of environmental dynamism on firms’ technological capacity suggests that efforts to develop products reinforce exploration and exploitation [64].

A comparable study reported findings from a Spanish corporation demonstrating that environmental dynamism is positively associated with organizational ambidexterity, improving technological performance [65]. In a less dynamic environment, businesses strategically position themselves with cost management (efficiency), and investment in technology decreases [40]. In a dynamic environment, companies tend to direct efforts toward exploration activities [66]. Companies that operate on a strategy of exploitative rather than exploratory processes show a trend toward stability [40]. In this context, the company’s internal learning process is slower, ambidexterity is affected, and the emphasis is on product improvement rather than product creation [63]. Environmental factors include complexity, unpredictability, competition, rapid technological advancements, shifting customer tastes, and constant pressure to improve and provide new goods and services [29,67].

Previous research is based on the Technology-Organization-Environment (TOE) framework through IT capability in explaining the antecedents of innovation ambidexterity and the moderating role of environmental dynamism [65]. The level of complexity of the environment, its uncertainty, competitiveness, constant changes in technology, variations in consumer preferences, and pressure to develop and innovate products and services [29,67]. 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 [68]. Thus, it is an important aspect that influences environmental dynamism on organizational ambidexterity, as it is an essential factor in the relationship between exploration and exploitation. Therefore, the dominance of various aspects of the environment ultimately shapes and directs the process of exploitation and exploration internally [29]. Environmental dynamism refers to the degree of unexpected changes in the organization’s environment [69]. Based on the preceding arguments, we contend.

- H5.** There is a moderating effect of environmental dynamism between technological capacity and organizational ambidexterity

Fig. 1 shows the model developed based on research by Andrade et al. [40] that technological capacity contributes to achieving organizational ambidexterity in environmental dynamism. Likewise, previous studies suggested that dynamic capability affects organizational ambidexterity [22,70–72]. The reconfiguration activity is needed in the process of technology absorption and dynamic

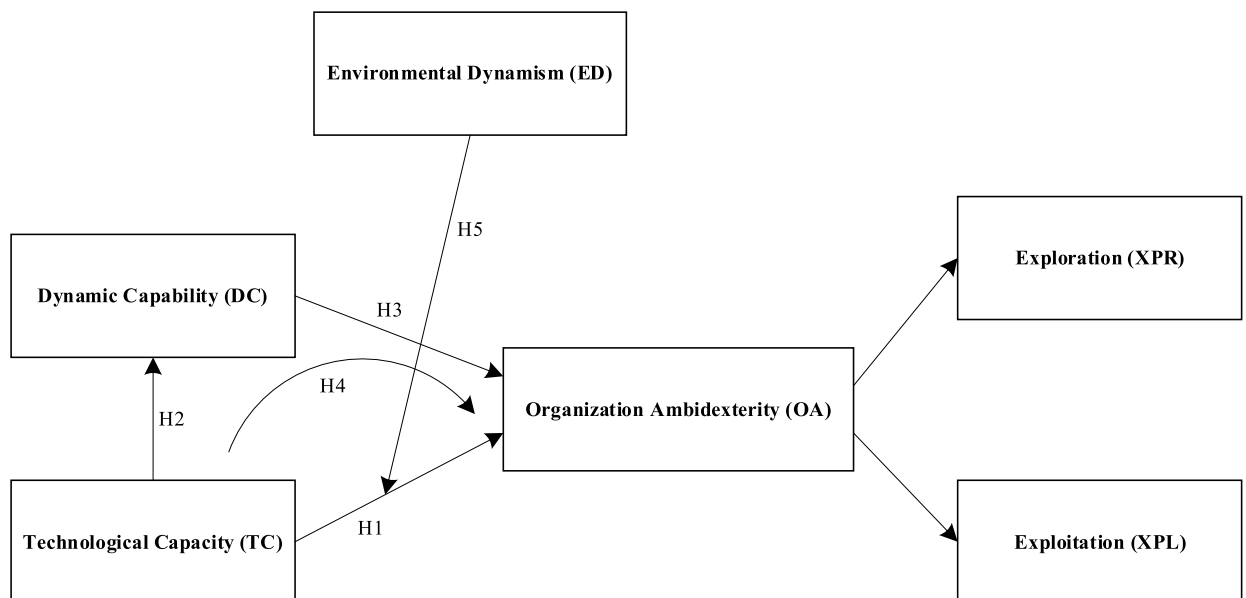


Fig. 1. The conceptual and hypothesis model.

capability. It is part of the process of technological absorptive capacity in achieving organizational ambidexterity [48,49].

### 3. Research methodology

The primary purpose of this study is to examine the role of technological capacity and dynamic capability on organizational ambidexterity and the moderating effect of environmental dynamism on the relationship between technological capacity and organizational ambidexterity. This study was designed using quantitative methods, and a survey-based instrument with a questionnaire was developed to test the hypotheses. Research questions using seven Likert scales were administered to the leaders of 107 commercial banks in Indonesia. Seventy-six feasible feedbacks were analyzed using SMART-PLS software using the structural equation model method based on Partial Least Square (PLS).

According to Hair Jr, Hult, et al. [73], 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 PLS-SEM, like any other statistical method, asks the researcher to consider the sample size according to the background and data characteristics of the study [73]. Alternatively, sample size requirements are specifically derived using Power Analysis based on the model and considering the most significant number of predictors [73].

Hair Jr, Hult, et al. [73] cite two power tests, G\*Power and Cohen [74], as a reference for sample determination. This research follows the lead of Hair and Cohen, who notes that the maximum number of independent variables in the measurement and structural models is seven. It means that this study requires a minimum of 51 observations to achieve 80% statistical power to detect an R<sup>2</sup> value of at least 0.25 (with a 5% probability of error), provided that the measurement model has good outer loading quality (>0.7).

#### 3.1. Study variables and measurement

Existing measurement models suited to the research context were utilized to evaluate the capabilities incorporated into our model.

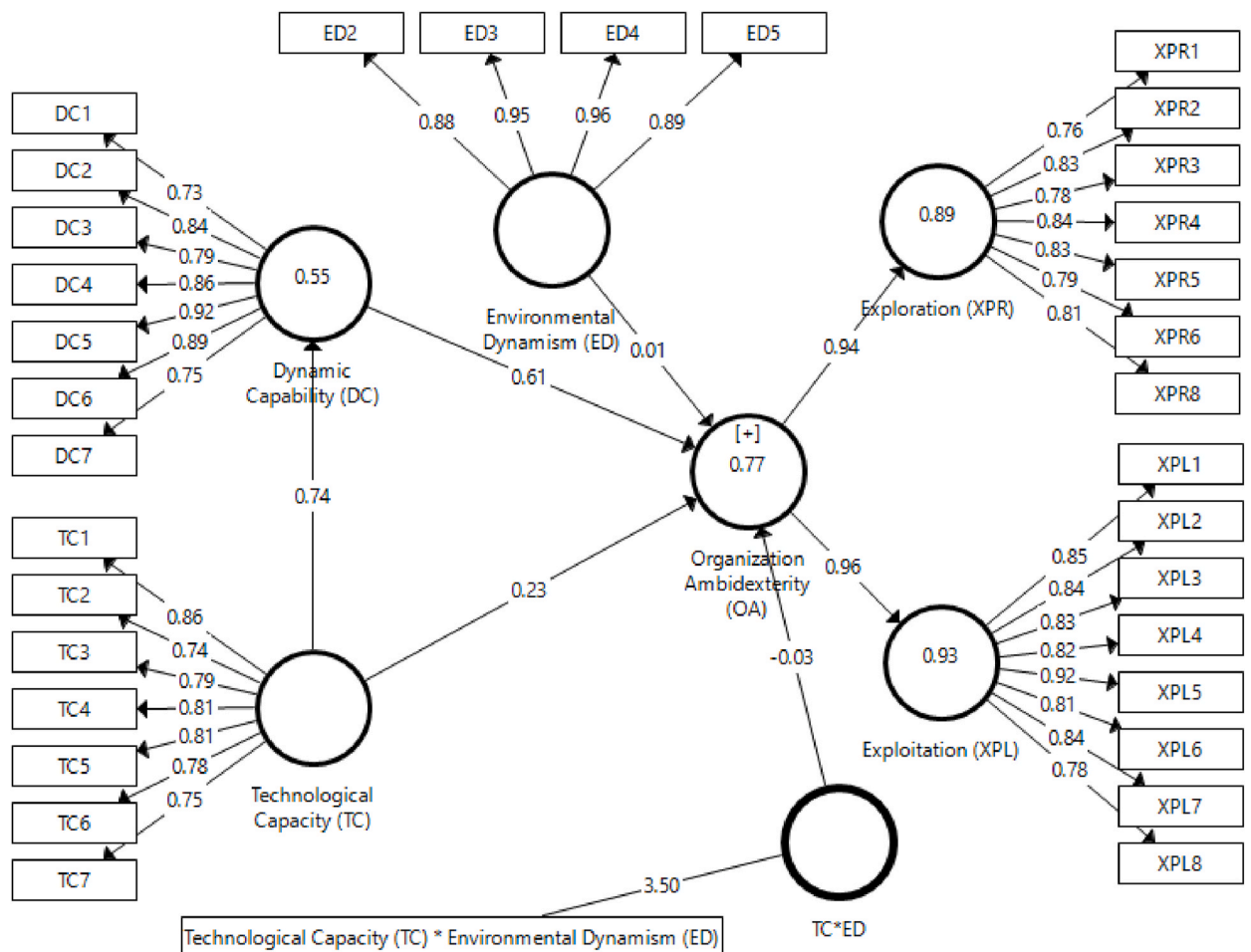


Fig. 2. Measurement model.

Respondents were asked to indicate the level of agreement for each measurement model statement on a 7- point Likert scale. All question items are measured on a Likert scale of 1–7, ranging from “Strongly Disagree to “Strongly Agree.” The constructs were developed after conducting an extensive literature review. To investigate the model, we used an existing measurement model that fits the context of our study. The measuring instrument is built using construct indicators adopted from previous studies.

To measure organization ambidexterity, we follow best practices in previous research using two dimensions, exploration and exploitation. Sixteen indicators organization ambidexterity was developed with reference to question items [27–29,31,65,75–77]. Questions were then drafted to be asked of commercial bank directors.

Technological capacity has seven indicators that are adopted [11,32,40,67]. These indicators include the company’s capacity to utilize various technologies, develop products more effectively, develop systems more effectively, the process more effectively, knowledge capacity of new techniques, develop new technology solutions, and invest in new technology.

The dynamic capability has seven indicators adopted from research by Hung et al. [78] and Frank et al. [79], which contain indicators including competitive flexibility, quickly identifying new business opportunities, entrepreneurial characteristics, combining employee knowledge and vision, evaluating the strengths and weaknesses, know the right direction and time to conduct R&D and employees balance work and family life.

Environmental dynamism has six indicators. The question items refer to previous research that is related to the indicators: customers’ tendency 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, and unpredictable actions of competitors [29, 65,68,80–83].

**Table 1**  
Confirmatory factor analyses and scale reliability.

Constructs	Measurements	Loadings	Alpha	CR	AVE
Organizational Ambidexterity			0.954	0.959	0.612
Exploitation			0.938	0.949	0.700
XPL1	Our bank strives to improve its expertise in utilizing available technology to increase productivity [27,28]	0.830			
XPL2	Our bank strives to improve competence in finding solutions to solve customer problems [28]	0.813			
XPL3	Our bank seeks to enhance existing expertise in product development [28]	0.827			
XPL4	Our bank strives to improve existing products/services [29–31,75]	0.826			
XPL5	Our bank regularly employs necessary minor adaptations of existing products and services [29–31,65]	0.893			
XPL6	Our bank promotes product/service enhancements to existing customers [29–31,65]	0.767			
XPL7	Our bank increases efficiency in the product/service delivery process [28–31,65,75]	0.761			
XPL8	Our bank expanded services to existing customers [29–31,65,75]	0.715			
Exploration			0.909	0.928	0.928
XPR1	Our bank has the capability to acquire new technologies [27,28,76]	0.651			
XPR2	Our bank has the ability to develop a mature management organization (e.g., forecasting technology and customer trends; identifying emerging markets and technologies, marketing, and other functions; managing product development processes) [28,77]	0.719			
XPR3	Our bank has the ability to create new products/services [28,29,31,65]	0.730			
XPR4	Our bank conducts experiments in creating new products/services [29,31,65]	0.755			
XPR5	Our bank commercializes each new product/service [29,31,65,75]	0.747			
XPR6	Our bank capitalizes on new opportunities [29,31,65,75]	0.835			
XPR7	Our bank utilizes new distribution channels in marketing products/services [29,31,65,75]	Drop			
XPR8	Our bank regularly seeks out and approaches new customers [29]	0.831			
Dynamic Capability (DC)			0.922	0.938	0.686
DC1	Our bank has competitive flexibility in its industrial environment (e.g., developing new products and technologies, effective communication and coordination between departments) [78]	0.733			
DC2	Our bank has the ability to quickly identify new business opportunities or potential threats that come up [78]	0.840			
DC3	Our bank leaders have entrepreneurial characteristics [78]	0.789			
DC4	Our bank has the ability to combine employee knowledge and vision [78]	0.860			
DC5	Our bank has the ability to evaluate the strengths and weaknesses of the organization [79]	0.917			
DC6	Our bank has the ability to know the right direction and time to conduct R&D [79]	0.889			
DC7	Our bank helps employees balance work and family life [79]	0.751			
Technological Capacity (TC)			0.902	0.922	0.628
TC1	Our bank has the capacity to utilize various technologies [40,67]	0.861			
TC2	Our bank has the capacity to develop products more effectively than other companies [40]	0.745			
TC3	Our bank has the capacity to develop systems in a more effective way than other companies [40]	0.793			
TC4	Our bank has the capacity to process in a more effective way than other companies [40]	0.807			
TC5	Our bank has the knowledge capacity of new techniques [40]	0.806			
TC6	Our bank has the capacity to develop new technology solutions [32]	0.783			
TC7	Our bank has new technology investment capabilities [11]	0.745			
Environmental Dynamism (ED)			0.938	0.956	0.845
ED1	Our bank customers tend to seek out new products [29,65,80]	Drop			
ED2	Changes in customer demands and tastes [68,80–82]	0.883			
ED3	Technological changes affect products/services [80–82]	0.945			
ED4	Competitive competitor strategies and actions [68,81]	0.961			
ED5	Instability of changes in the environment outside the company [82,83]	0.885			
ED6	Unpredictable actions of competitors [81]	Drop			

We translated the research questions into Bahasa Indonesia and made adjustments without compromising the essence and originality of the questions.

### 3.2. Measurement model

In this section, the evaluation of the reflective measurement model evaluates the reliability (reliability of each indication and internal reliability discrepancy) and validity (reliability of each indicator and internal reliability inconsistency) (convergent and discriminant validity) [84]. Due to the fact that organizational ambidexterity has two opposing dimensions, its measurement is of “second order” as shown in Fig. 2. Reflective scales are required to exhibit internal consistency as a requirement for validity, whereas validity must be established internally (convergent validity) as well as externally (discriminant and predictive/criterion validity). Formative scales are best characterized as indices rather than latent constructs because there is nothing “unobservable” when items define the construct [85]. The next step is to process the SMART PLS data using the PLS algorithm (300 maximum iterations, standardized values, and a centroid weighting scheme). The PLS Algorithm’s results are shown in Table 1 and Fig. 2. Loading factors greater than 0.4 reflect the indicator’s dependability [86].

However, it is frequently discovered in social science research that loading factors are less than 0.7, necessitating additional care in deleting indicators smaller than 0.7 if they do not alter the composite reliability or content validity of a concept [73]. Loading factors between 0.4 and 0.7 are particularly important when deleting indicators due to their impact on composite reliability (or the extracted average variance); hence loading factors below 0.4 must be deleted [73]. As shown in Table 2, indications ED1, ED6, and XPR7 must be deleted since their loading factors are less than 0.4. On the environmental dynamism construct, the ED1 indicator refers to the question, “Our bank clients prefer to look for new goods.” The ED6 indicator, on the other hand, has to do with the question, “The actions of competitors are surprising.” While the XPR7 indicator corresponds to the exploration construct question, “Does our bank leverage new distribution channels for promoting products or services?” (organizational ambidexterity).

Table 1 shows convergent validity, which describes the relationship and interrelationship between items or indicators. It can be seen that there is no Alpha and CR < 0.7 and no factor loading < 0.5. It shows that the relationship between items is very strong.

Table 2 shows discriminant validity, which describes the relationship between constructs. It may be seen that the Heterotrait Monotrait ratio (HTMT) is not greater than 0.85 or a maximum of 0.95. It also explains that the relationship between variables is also high.

Table 3 shows the path coefficient or direct relationship between variables. The relationship between dynamic capability and technological capacity with organizational ambidexterity is accepted. Then the relationship between technological capacity and dynamic capability is also accepted. However, the direct relationship between environmental dynamism on organizational ambidexterity is not accepted, and the moderating effect of environmental dynamism on technological capacity on organizational ambidexterity is not accepted. So it can be concluded that H1, H2, H3, and H4 are accepted, while H5 is rejected.

## 4. Discussion

The results show that the technological capacity of commercial banks in Indonesia affects organizational ambidexterity. The bank’s ability to use various technologies is the strongest indicator in measuring the technological capacity construct, the bank’s effectiveness follows it in using technology, and the bank is very concerned about new techniques in the use of technology. Research [45] indicates that the technological capacity of SMEs influences the creation of company ambidexterity.

Our findings suggested that businesses must continuously enhance their technological capacity to foster organizational ambidexterity, and dynamic capability mediates this relationship. In the following sections, we will discuss the implications of our findings for the performance of the banking industry, the function of dynamic capability as a mediator, and the role of environmental dynamism as a moderator.

The current literature on organizational ambidexterity focuses on the employees [87,88]. This study is the first empirical analysis of technological capacity and identifies strategies for achieving organizational ambidexterity through dynamic capability, especially in the banking sector. The results show how well technology affects Indonesian commercial banks’ organizational ambidexterity. As the most significant indicator of technological capacity, bank ambidexterity refers to a bank’s ability to utilize various technologies. The effectiveness of banks in their use of technology and their capacity to master new techniques in their use of technology serve as the subsequent indicators. The study also found that small and medium-sized enterprises should grasp digital technologies such as the internet of things (IoT), cloud computing, big data, and cyber-physical systems. In line with the study on small and medium-sized businesses in Portugal, technological capacity greatly benefits organizational ambidexterity [40]. These findings are consistent

**Table 2**  
Discriminant validity.

	DC	ED	Moderating Effect ED-TCtoOA	OA	TC
DC					
ED	0.610				
Moderating Effect ED-TCtoOA	0.633	0.789			
OA	0.909	0.604	0.644		
TC	0.788	0.560	0.572	0.789	

**Table 3**  
Path analysis.

Path	Beta	Standard Deviation	T Statistics	P Values	Result
H1:TC → OA	0.232	0.095	2.432	0.015	Supported
H2:TC → DC	0.745	0.088	8.489	0.000	Supported
H3:DC → OA	0.610	0.106	5.728	0.000	Supported
H4: TC → DC → OA	0.454	0.094	4.825	0.000	Supported
H5: Moderating Effect ED-TcToOA	-0.033	0.083	0.394	0.694	Rejected

with this theory. In the same way, research on small and medium-sized manufacturing firms in Spain shows that technological capability was positively related to firm ambidexterity [65].

Previous studies on small and medium enterprises yielded the same results when applied to large companies like banks. Trying to balance exploration and exploitation in the banking world is very complex. The role of technology can add new parameters to realize ambidextrous commercial banks, especially in Indonesia.

The analysis results show that, unlike in the banking industry, environmental change does not affect achieving organizational ambidexterity and has no moderating influence. Banking as a financial services sector ranks best in technological transformation [89]. Fintech, blockchain, and super-apps are manifestations of the rapidity of this transformation.

Then, a study on Belgian firms with CEOs indicates that technological instability also affects the company's exploration and exploitation operations [90]. The occurrence of unpredictable conditions and quick changes encourages businesses to be adaptable regarding their technological requirements to accommodate these changes. Still, the analysis shows that technological disruption does not affect the company's efforts to find and use natural resources. This fact shows that the banking industry's efforts to become a digital bank depend on how well it uses technology. On the other hand, the banking industry's dynamic environment will stimulate efforts to balance exploration and exploitation activities.

The study's findings indicate that the banking sector's dynamic capability helps organizational ambidexterity. This result aligns with the research conducted by Refs. [78,91,92]. In detail, a study about pharmaceutical firms in Iran demonstrates that ambidexterity responds to technological changes; hence, organizations require the dynamic capability to access and absorb technology [91]. In other words, banks need dynamic capabilities to ensure they have the right ambidextrous technology. The results of this study reveal that the bank's dynamic capability increases due to personnel competency, new ideas, departmental collaboration, and the ability to identify business opportunities and risks.

## 5. Implication

In this study, several contributions can be derived from the literature related to the antecedents of organizational ambidexterity, which includes technological capacity and dynamic capability in environmental dynamics. Technological capacity can act as an exploration or exploitation activity. When banks invest in technology and its attributes, technological capacity acts as an exploration activity. In general, banks in Indonesia have established technology so that when they empower and optimize existing technology, technological capacity acts as an object of exploitation.

Our findings show that technological capacity demands flexibility to respond quickly to environmental changes. At the same time, the ability to both exploit and explore resources is beneficial to banking ambidexterity. A previous study has identified the technological capacity influencing organizational ambidexterity [40]. Even though, in general, the banking sector will continue to catch up with technological capacity, the requirement for dynamic capability as a mediator to apply to organizational ambidexterity will persist.

Following prior research by Andrade et al. [40] and Mikalef & Pateli [55], we found that technological capacity has a considerable and positive effect on organizational ambidexterity and a significant and positive impact on dynamic capability. Our research also confirmed that dynamic capability significantly and positively affected organizational ambidexterity. We derived the technological capacity using various technologies: product development capacity, system development capacity, process development capacity, new technical knowledge capacity, capacity to develop new technology solutions, and technology knowledge investment capability [40]. As shown in Table 1, we proposed construct-based indicators and hypothesized the links between technological capacity and these ideas.

According to recent studies, businesses that simultaneously employ exploration and exploitation tactics have a better chance of surviving [46]. No earlier research has related technological capacity and dynamic capability with organizational ambidexterity, making this discovery particularly significant. When dynamic capabilities mediate between technological capacity and ambidexterity, technological capacity will exert a more substantial influence. Furthermore, dynamic capability is an enabler in the process of learning, selecting, and using the right technology for the company.

This study proves that environmental dynamism has no moderate link with technological capacity and organizational ambidexterity.

In a less dynamic environment, businesses strategically position themselves with cost control (efficiency), and investment in technology decreases [40]. In a dynamic environment, companies tend to direct their efforts toward exploration activities [66]. Companies using an exploitative process approach instead of an exploratory one tend to be more stable [40]. In this environment, the company's internal learning process is slower, impacts ambidexterity, and focuses on product enhancement instead of product creation

[63].

When the environment is highly dynamic, product development and product cycles are short, new products emerge, and information flow is accelerated. Organizations should take bold, calculated steps to improve their competitive position. As a result, businesses have a more challenging time [1]: assimilating and predicting the environment [2], identifying the impact of new technical advancements, and [3] converting this information into focused actions and decisions [60]. If environmental conditions are highly volatile, it is feasible that banks' technological capacity will have a negative effect. The cornerstone for developing organizational ambidexterity will be preparedness and current technology. In other words, if the bank improves its technological capacity in a highly dynamic environment, the security risk associated with that technology will also rise.

The use of technology such as electronic payments is very effective in reducing cost efficiency and also proves effective in increasing cost efficiency. Hence, banks concentrate on shifting from traditional payments to virtual services (remote banking) and increasing the supply of electronic payment channels [33]. Fintech's emergence compels traditional financial centers and current financial institutions to reconsider their tactics to maintain a foothold in the era of financial digitization.

[93]. Technological capacity in SMEs and banks both contribute to organizational ambidexterity. The financial sector, such as fintech and neo-bank, relies heavily on technological capacity. Because the development of fintech is a financial service revolution and opportunity, it is a risk for the banking sector [94]. Decision makers should be concerned with strategic exploration to decide on policies for adaptation, adoption of specific technologies, or acquisition, as well as collaboration with fintech and neo-banks. Decision-makers review the company's dynamic capabilities concerning acquisition, adaptation, and collaboration policies to determine the right strategies and policies. As a regulator of policies and regulations, the government provides clear rules in the implementation of business activities of commercial banks, fintech, and the like to ensure business continuity can compete healthily in the dynamism of the environment that occurs.

## 6. Conclusion

Organizational ambidexterity is the key to organizational effectiveness and long-term business viability. Determining the foundations and elements that impact and contribute to organizational ambidexterity is crucial. In conclusion, technological capacity influences organizational ambidexterity. The increasingly fast technological advances that enable the formation of new business models in the financial services industry, a sign of environmental dynamism, make the technological capacity of banks a crucial factor. Banks must evaluate the technological capacity of the organization, which includes [1] the ability to utilize several technologies [2], bank effectiveness in using technology, and [3] the capacity to learn new technology techniques. However, the role of environmental dynamism as a moderator has not shown a relationship between technological capacity and organizational ambidexterity. Technological capacity is one of the main antecedents in efforts to achieve the organizational ambidexterity of commercial banks in Indonesia. The company's dynamic capabilities envisage that technology will play a more significant role. In addition, technological capacity will be optimal when human resources can synergize. Future studies may also investigate the relationship between human resources and technology and the level of financial fraud.

## 7. Limitations and future research

There are also some limitations to this paper. First, the sample was collected in a single country, limiting the ability to generalize the findings to other nations. However, the created framework of indicators must allow for the study replication in diverse circumstances. Importantly, our findings also give significant insights for managers in companies that rely substantially on innovation activities and the value of knowledge assets. Second, future research should consider other environmental characteristics (e.g., complexity). Considering the quality of the questionnaire in order to avoid an overly lengthy questionnaire, such additional characteristics were not taken into account in this study.

Other suggestions for future research may also be considered. For example, the relationship between CEO experience and technological capacity is attributed to its influence on exploration or exploitation or the moderating effect of environmental characteristics on organizational ambidexterity in other sectors.

## Author contribution statement

Tyna Yunita; Sasmoko Sasmoko; Agustinus Bandur; Firdaus Alamsjah: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

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## Data availability statement

Data will be made available on request.

## Declaration of interest's statement

The authors declare no competing interests.

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