

The effects of executives' overseas background on enterprise digital transformation: evidence from China

Executives'
overseas
background

Dongmei Hu

School of Management, Xihua University, Chengdu, China

Yang Peng

*Research Institute of International Economics and Management,
Xihua University, Chengdu, China*

Tony Fang

*Faculty of Humanities and Social Sciences,
Memorial University of Newfoundland, St. John's, Canada, and*

Charles Weizheng Chen

*School of Business, Sichuan University, Chengdu, China and Research Institute of
International Economics and Management, Xihua University, Chengdu, China*

Received 29 November 2021

Revised 8 April 2022

3 August 2022

Accepted 7 August 2022

Abstract

Purpose – The purpose of this study is to examine the effects of executives' overseas education and work experience on enterprise digital as executives' overseas background is critical to the development of enterprises. It also explored the mediating role of enterprise digital transformation on the relationship between executives' overseas background and enterprise growth.

Design/methodology/approach – Chinese A-share companies listed on the Shanghai and Shenzhen Stock Exchanges for the period 2018–2020 were analyzed using regression analysis and bootstrapping to verify hypothesized relationships.

Findings – Executives' overseas study and work experience both enhanced enterprise digital transformation significantly, thus improving enterprise growth. The level of employee education moderated the mediating role proposed in the theoretical model. Moreover, the promoting effect of executives' overseas background on enterprise digital transformation was more significant for non-state-owned enterprises and those in eastern China.

Practical implications – The findings provide reference for the formulation and optimization of companies' human resource structure and have implications on the improvement of enterprise digital transformation and enterprise growth.

Originality/value – This study explored the factors influencing enterprise digital transformation at the microlevel of corporate human capital, thereby providing microlevel empirical evidence for research on the factors influencing enterprise digital transformation. Its findings shed light on the mechanism and context

Financial support from the National Social Science Foundation of China research grant (19BGJ005) “Comparative Study on Competitive Strategies and Migration Policies of Overseas High-Level Talents Between China and Developed Countries”, National Natural Science Foundation of China key research grant (72032002), Social Science and Humanities Research Council of Canada (890-2020-0051), and The Innovation Fund of Research Institute of International Economics and Management, Xihua University (20210030) is gratefully acknowledged.



under which executives with overseas backgrounds may enhance enterprise digital transformation and growth.

Keywords Overseas background of executives, Enterprise digital transformation, Enterprise growth, Level of employee education

Paper type Research paper

1. Introduction

In this “digital transformation era” (Pucihar, 2020), new technologies are changing almost all aspects of society, making life and work more dynamic, altering the market environment and disrupting existing industries first through the digital transition economy, thereby leading to great uncertainty and complexity and bringing new challenges and opportunities to companies (Quinton *et al.*, 2018).

From an intra-firm perspective, some scholars view digital transformation as a strategy (Bharadwaj *et al.*, 2013; Kane *et al.*, 2015), whereas others understand it as a process of reshaping business models because of the adoption and use of digital technologies (Jeansson and Bredmar, 2019). Enterprise digital transformation goes beyond changing business processes: it enables the creation of new kinds of organizations (cultural and business models) and changes relationships, customer reach (value creation in terms of products and services) and market positioning (Lucas *et al.*, 2013). Companies view digitalization as a source of future competitiveness because of its potential to unlock new value creation and revenue generation opportunities (Gölzer and Fritzsche, 2017; Kamalaldin *et al.*, 2020). For customers, digital consumption has become a preference (Herhausen *et al.*, 2019; Lemon and Verhoef, 2016), underscoring the importance of digital transformation for companies to become more attractive and easily identify sustainable competitive advantages (Ferreira *et al.*, 2019). The COVID-19 pandemic has particularly hit various industries hard (Suneson, 2020). Some scholars argued that digital transformation is expected to play a key role in pandemics such as COVID-19, as well as offer an opportunity for economic growth (Kim *et al.*, 2021). Highly digitalized enterprises have been touted for their strength in maintaining their business operations, driving the digital transformation of other companies (Jansiti and Richards, 2020).

The Chinese Government has issued a series of policy documents related to enterprise digitalization to promote the digital transformation of enterprises in various fields and contribute to high-quality economic development. The fifth Plenary Session of the 19th Central Committee of the Communist Party of China also clearly proposed to “promote digital industrialization and industrial digitization, promote the deep integration of the digital economy and entity economy, and build digital industry clusters with international competitiveness.” In June 2021, China Internet Weekly and eNet Research Institute ranked in the top 100 enterprises that promote China’s digital transformation, among which Huawei, Alibaba and Tencent took the top three spots. However, most enterprises in China keep struggling to achieve digital transformation and face a high risk of failure.

What accounts for a successful transition? Digital transformation is not a simple technological upgrade; external policies, institutions and imported digital assets do not represent the entire digital transformation of an enterprise; it requires specific capabilities – networked business processes and big data analytics (Verhoef *et al.*, 2021) – of the enterprise’s human resources, especially the decision-makers. Recent research indicates that new dynamic capabilities for digital sensing, digital capture and digital transformation are important for enabling enterprises to remain competitive in a highly dynamic digital economy. The dynamic capabilities framework is seen as the theoretical basis for the digital transformation of enterprises (Warner and Wäger, 2019). For executives, the drive of

digital technology has also become a new feature of dynamic management capabilities expressed at the microlevel, and their support is essential for enterprise digital transformation (Wrede *et al.*, 2020). Enterprise practice also shows that digital transformation demands high requirements on enterprise's comprehensive planning, management and operational capabilities; the difference in these capabilities is an important factor in the widening of the digital transformation gap (Kim *et al.*, 2021). If executives cannot effectively implement digital transformation strategies, the enterprise will not obtain any benefits (Marolt *et al.*, 2020), thus preventing enterprise growth. From the résumés of nearly 50,000 executives from 3,720 listed A-share companies in China, we found that approximately 4,600 executives have overseas backgrounds, and approximately 60% of the executive teams of enterprises comprised talent with an overseas background. This demonstrates that Chinese enterprises attach great importance to talent with an overseas background. Whether an overseas background, which has been regarded as influencing the management ability and professional level of senior executives (Zhou *et al.*, 2015), can promote the implementation of enterprise digital transformation and whether such promoting effect is the same across enterprises with different ownership nature and different regions remain to be explored. Moreover, the education level of employees has a significant effect on enterprise performance (Juliani and Windu, 2017), and enterprises spend generously to recruit highly educated employees. With improvements in digitalization, the level of firm connectivity and information sharing is increasing, which contributes to the breaking of hierarchies, functions and organizational boundaries, ultimately leading to the morphing of task-based activities into more project-based ones, wherein employees are required to participate directly in the creation of new added value (Cortellazzo *et al.*, 2019). Therefore, the education level of employees may be an important conditional factor in the impact of an executive's overseas background on digital transformation.

Previous studies mainly focused on the following three aspects of enterprise digital transformation. First are the benefits brought by digital transformation to enterprises such as the impact of artificial intelligence readiness of small- and medium-sized enterprises (SMEs) on their international performance (Denicolai *et al.*, 2021), technological innovation (Liu *et al.*, 2020) and knowledge creation (Furman and Teodoridis, 2020), as well as the role of knowledge management systems in corporate governance (Di Vaio *et al.*, 2021), the service-oriented impact of the Internet of things on corporate business models (Paiola and Gebauer, 2020), the impact of digital technologies on corporate marketing activities (Ziółkowska, 2021) and so on. Second are the barriers to digital transformation of enterprises. Diener and Špaček (2021) used a sample of German banks to explore factors of concern and obstacles encountered at various levels in the digital transformation of banks. Soluk and Kammerlander (2021) studied obstacles to the digital transformation process of SMEs using semi-structured interviews. Cichosz *et al.* (2020) concluded that the main barriers faced by logistics service providers to digital transformation were the complexity of logistics networks and lack of resources, and Breidbach *et al.* (2019) identified challenges and proposed future research directions in digital transformation for financial service systems. The third is how companies carry out digital transformation. Correani *et al.* (2020) analyzed the cases of three digitally successful companies, ABB, CNH and Vodafone, and proposed the necessary elements for companies to implement digital transformation strategies, while Fischer *et al.* (2020) studied how five companies used business process management to achieve digital transformation, and others proposed three stages in the digital transformation process of SMEs based on case studies of family-owned SMEs (Soluk and Kammerlander, 2021).

In summary, although the digital transformation of enterprises has been extensively studied from a technological perspective, scholars have not viewed the subject from the perspectives of executive teams and employees; our study fills this gap.

We used companies listed on China's Shenzhen and Shanghai Stock Exchanges for the period 2018–2020, drew upon the upper echelons theory (Hambrick and Mason, 1984) and developed a moderated mediating model of executives' overseas background, enterprise digital transformation, enterprise growth and employees' education level. This study considered enterprise digital transformation from the executive team's perspective, highlighting the importance of absorbing talent with an overseas background and recruiting high-quality employees in the process of digital transformation to improve enterprise growth.

The remainder of this paper proceeds as follows. Section 2 presents the hypotheses based on the theoretical framework and the existing literature. Section 3 describes the sample and illustrates the methodology. Section 4 discusses the findings, where the findings are retested using various robustness checks. Finally, Section 5 provides the conclusions and discusses implications.

2. Theory and hypotheses

2.1 Executives' overseas background and enterprise digital transformation

The upper echelons theory was first proposed by Hambrick and Mason (1984), highlighting that the effects of executives' characteristics on their thought processes and strategic choices influence firm behavior. Executives' cognitive biases, values and insights and the interplay among these traits are influenced by their past experiences (Hambrick and Mason, 1984), such as studying or working abroad. Digital transformation as a strategy in an enterprise (Bharadwaj *et al.*, 2013; Kane *et al.*, 2015), it requires specific capabilities of decision-makers (Verhoef *et al.*, 2021). Decision-making, including this for digital transformation, is one of the major roles of executives in an enterprise, which means enterprise digital transformation could be influenced by the background characteristics and capabilities of executives. Applying the upper echelons theory, Zhang and Fu (2020) proposed that returnee executives are more willing to proactively take corporate risks. We argue that enterprise transformation are more likely to be exposed to high risks. Because the executives' overseas experience increases their willingness to take such risks, such experience influences their perceptions and views of the current situation and ultimately lays the groundwork for their strategic choices for transformation.

Recently, digitalization has profoundly changed business models and consumer behaviors, leading to enormous pressure on traditional companies to achieve digital transformation. Simultaneously, digital transformation has inevitably changed the competitive landscape and the war for talent in today's organizations (Jackson and Dunn-Jensen, 2021). Digital transformation is regarded as a key challenge for companies, requiring high-quality talent, especially exceptional executive teams (Collin *et al.*, 2015). In this context, executives with overseas experience have received considerable attention in theory and practice for their cutting-edge expertise and advanced management experience (Kapur and McHale, 2005). In addition, Adner and Helfat (2003) proposed dynamic managerial capabilities, which are based on managers' cognition, human capital and social capital, and are advanced capabilities for managers to construct, integrate and reconfigure organizational resources to adapt to dynamic environments. The three core underpinnings of dynamic managerial capabilities are closely related to the overseas background of executives and enterprise's digital transformation. First, executives' early experiences influence their managerial perceptions, which allows them to filter the available data to interpret the current market situation (Hambrick and Mason, 1984), and thus influence the digital transformation of the enterprises. Second, according to research findings, managerial

human capital relies on individuals' educational background and prior work experience (Helfat and Martin, 2015). Executives who studied or conducted academic research overseas can keep abreast of the latest trends and technologies in their fields through international study and exchange, benefitting a country's economic and scientific development (Liu, 2016). Meanwhile, companies need to keep abreast with the latest developments to carry out digital transformation. People with overseas work experience tend to face competitive pressure and uncertainty at work more positively (Zikic *et al.*, 2010) and have a higher level of tolerance and risk management capacity (Bouquet and Birkinshaw, 2011). Work is now more cognitively complex, collaborative and time-sensitive than it used to be (Zeike *et al.*, 2019). Executives with overseas backgrounds may be more resilient against the intense pressures of corporate digital transformation and make more business-friendly decisions. Finally, research has shown that when individuals with foreign experience join corporate boards, they can build international relationship networks that local executives do not have (Giannetti *et al.*, 2015). Expanding key interfirm relationships in business networks is an effective way for managers to improve their social capital, seize opportunities, avoid threats and reallocate resources (Tasheva and Nielsen, 2020). These networks of business relationships are also an important part of an enterprise's digital transformation (Bharadwaj *et al.*, 2013). Despite these advantages, some scholars argue that returnee leaders are unfamiliar with the domestic market and their thinking and perceptions may not be compatible with the domestic environment, causing companies led by them to perform worse than those led by local talent (Li *et al.*, 2012). However, as the overall level of internationalization of domestic companies continues to increase, the adaptation of executives with overseas backgrounds to domestic companies may improve. The analysis above indicates that the inclusion of talent with an overseas background in the executive team affects an enterprise's digital transformation considerably. Therefore, we hypothesize that:

- H1. Executives' overseas background is positively related to enterprise digital transformation.
- H1a. Executives' overseas education is positively related to digital transformation.
- H1b. Executives' overseas work experience is positively related to digital transformation.

2.2 Mediating role of enterprise digital transformation

According to the Digital China Development Report (2020) released by the Cyberspace Administration of China (CAC), China's total digital economy ranked second worldwide, with its added value reaching 7.8% of gross domestic product. However, according to the Global Digital Economy Competitiveness Development Report recently released by the Institute of Information of the Shanghai Academy of Social Sciences, the USA has ranked first worldwide in terms of competitiveness in digital economy for four consecutive years, while China has ranked third, presenting opportunities for further advancement.

The wave of digital transformation is now spreading across many industries, but not all attempts to implement digital strategies succeed. While digital technologies minimize redundant processes, increase corporate profits (Bharadwaj, 2000) and enable enterprises to create value by introducing digital business models (Remane *et al.*, 2017), an enterprise's digital transformation is time-consuming and expensive (Guo and Xu, 2021). Moreover, many companies invest a great deal in this process, but financial returns are not guaranteed and require time to emerge (Müller *et al.*, 2018; Pagoropoulos *et al.*, 2017). The latest Digital Economy and Society Index Report of the European Commission (2019) shows that less than a fifth of enterprises in the EU-28 are highly digitized. Moreover, according to recent

estimates, 66%–84% of digital transformation projects fail (Libert *et al.*, 2016). Given that implementing a digital strategy is costly and risky, enterprises face significant transformation challenges (Cozzolino *et al.*, 2018). As such, is the impact of executives' overseas background on enterprise digital transformation positive or negative for the growth of the enterprise?

In theory, the executive team's perceptions resulting from their interpretation of the current environmental and organizational scenarios depend on the executives' backgrounds (Hambrick and Mason, 1984), and differences in executive team behaviors result in different corporate development situations. Some scholars have empirically concluded that managerial capabilities and managerial cognition act on the strategic decision-making of enterprises (Helfat and Martin, 2015; Nadkarni and Barr, 2008). In today's highly dynamic environment, enterprises in traditional industries need to maintain their competitive advantage through strategic transformation (Liu *et al.*, 2016), which is the breakthrough point that allows an enterprise to maintain sustained growth capacity. On one hand, the digital transformation of enterprises has led to organizational changes and product line upgrades (Lucas *et al.*, 2013), the combination of which contributes to short-term, medium-term as well as long-term enterprise growth in emerging economies (Shirokova *et al.*, 2014). On the other hand, to actively survive in the dramatically changing digital environment, enterprises must plan and apply digital transformation based on its accurate perception and be prepared to continuously operate and manage digital transformation, which is critical to sustainable growth (Kim *et al.*, 2021). Digital transformation, while inevitable, should not be seen as an end in itself (Tekic and Koroteev, 2019; Verhoef *et al.*, 2021); instead, improved growth is what enterprises should expect when undergoing digital transformation. However, despite the substantial interest in enterprise growth, the literature review concludes that research still provides a limited understanding of the driving mechanisms behind how enterprises grow in the digital era. The analysis above indicates that executives with overseas backgrounds may offer considerable opportunities to achieve higher enterprise growth with digital transformation. Therefore, we hypothesize that:

- H2.* Enterprise digital transformation mediates the relationship between executives' overseas background and enterprise growth.
- H2a.* Enterprise digital transformation mediates the relationship between executives' overseas education and enterprise growth.
- H2b.* Enterprise digital transformation mediates the relationship between executives' overseas work experience and enterprise growth.

2.3 Moderating role of employees' education level

To undergo enterprise digital transformation, it is not only necessary to obtain resources from outside but also to face the challenge of extracting and analyzing valuable information in big data (Verhoef *et al.*, 2021), which relies on human resources to explore and apply advanced knowledge and technologies related to digitalization. Digital technologies change the way employees work and collaborate (Schwarzmueller *et al.*, 2018); enterprises can effectively use digital resources only when human resources are able to organize their workflows effectively (Caputo *et al.*, 2017). Although several studies on enterprise digital transformation have dealt with external and internal factors, human capital factors have received little attention.

Digital transformation and firm growth depend on knowledge, work and technology innovation (Bouncken *et al.*, 2021). Employees are the main sources of knowledge and technology, and they can apply the practical information they possess to tackle the changing environment and ensure successful implementation of company strategies.

In implementation corporate strategies, the efficiency of the process depends on the employees' competencies (Prusak, 2016). Employees' education level is an important marker of their competencies and a key indicator of enterprise recruitment. A high level of education can bring individuals richer knowledge and skills, and these individuals are more likely than others to identify and recognize opportunities (Becker, 2009). Moreover, employees with a high level of education have strong information search and processing abilities and have a comparative advantage in learning and using new technologies (Goldin and Katz, 1996). The ability to identify opportunities, adapt to new technologies and use information effectively is essential human capital for companies in digital transformation. Employees with these advantages can provide technical and knowledge support for executives with overseas backgrounds. Capozza and Divella (2019) argue that enterprises should invest in a highly educated labor force and experienced executives to improve their technological level. Furthermore, digital transformation is more about organizational and strategic transformation than just the application of technology (Björkdahl, 2020), which requires leaders to organize and adjust internal talent effectively. It also requires employees to match the efforts of their leaders, so that enterprises' core competitiveness can be aligned with the needs of the new economy (Jackson and Dunn-Jensen, 2021). Given the discussion above, does the education level of employees have a moderating role in the relationship between executives' overseas background and enterprise digital transformation? Considering employee characteristics, we propose that:

- H3. Employees' education level moderates the relationship between executives' overseas background and enterprise digital transformation.
- H3a. Employees' education level moderates the relationship between executives' overseas education and enterprise digital transformation.
- H3b. Employees' education level moderates the relationship between executives' overseas work experience and enterprise digital transformation.

The abovementioned hypotheses propose that executives' overseas background can influence enterprise growth through digital transformation and that employees' education level plays a moderating role in the relationship between executive's overseas background and enterprise digital transformation. These three hypotheses are integrated into the theoretical research model to form the moderated mediation model shown in Figure 1 (Preacher et al., 2010). Moreover, according to the human capital theory proposed by Schultz (1961), education is the most basic and primary way to improve human capital, and individuals with a high level of education have greater human capital, which is reflected in the market in terms of higher labor productivity and greater profitability. Employees are the

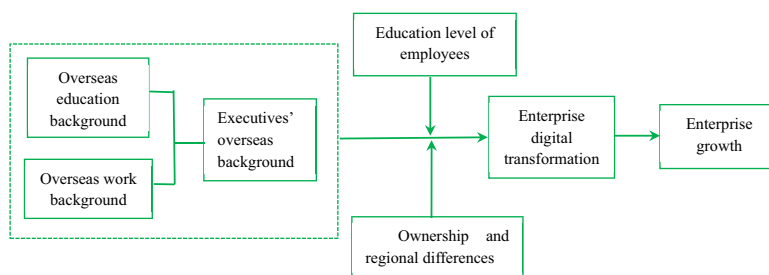


Figure 1. Theoretical model

direct actors in business operations, and their productivity and profitability are closely related to enterprise growth. Hence, we propose that:

- H4.* The indirect effect of executives' overseas background on enterprise growth through enterprise digital transformation is stronger at high levels of employee education than at low education levels.
- H4a.* The indirect effect of executives' overseas education on enterprise growth through enterprise digital transformation is stronger at high levels of employee education than at low education levels.
- H4b.* The indirect effect of executives' overseas work experience on enterprise growth through enterprise digital transformation is stronger at high levels of employee education than at low education levels.

2.4 Heterogeneity of enterprise ownership nature and region

Executives with overseas backgrounds can now be found in many companies. We hypothesized that such backgrounds could accelerate the digital transformation of enterprises and thus improve their growth. However, relying on human capital strengths alone does not necessarily lead to successful digital transformation; external environments, such as differences in enterprises' nature of ownership and regions, have subtle influences on the behavior of people and their performance.

First, the ownership type of an enterprise represents its organizational system, context and resource environment (Li *et al.*, 2010), and enterprises with different types of ownership have different corporate goals that influence their investment decision preferences (Choi *et al.*, 2011). Enterprises in China can be divided into state-owned and non-state-owned (most of them are private, and a few are foreign-owned) according to the nature of ownership (right of ownership of property). In recent years, the government has paid more attention to attracting overseas talent to facilitate state-owned enterprises' digital transformation, expecting them to take the lead to drive the high-quality development of China's enterprises. Government assistance will be provided when state-owned enterprises are struggling with business difficulties (Sun *et al.*, 2002). However, compared with non-state-owned enterprises, state-owned enterprises are regulated by stricter governmental supervision, and the appointment and decision-making of executives are also subject to government intervention (Piotroski *et al.*, 2015). The selection and promotion of executives in state-owned enterprises are based on both managerial capabilities and political considerations (Zhou *et al.*, 2017), which stymies their full utilization of managerial capabilities and makes them more willing to stay in their comfort zone than taking risks. In addition, the executive compensation of state-owned enterprises is subject to the "Executive Compensation Regulation" of the government, which reduces executives' motivation to initiative digital transformation. Therefore, we propose that:

- H5.* The influence of executives' overseas background on digital transformation may be heterogeneous because of the nature of enterprise ownership.
- H5a.* The influence of executives' overseas education background on digital transformation may be heterogeneous because of the nature of enterprise ownership.

H5b. The influence of executives' overseas work background on digital transformation may be heterogeneous because of the nature of enterprise ownership.

Second, China's regional economic development is extremely unbalanced; enterprises located in the eastern coastal regions are more developed and better able to attract and retain talent with an overseas background than those in the central and western regions. Differences in the level of human capital directly lead to differences in the subjective desire and the ability to absorb advanced technologies in different regions (Borensztein *et al.*, 1998). For businesses, locating in economically developed regions is more conducive for accessing external capital and resources (Claessens and Laeven, 2003), and access to capital and resources can assist companies to make transformation and upgrading. For executives, in the eastern region, where market competition is fierce, digital transformation has become more crucial to enhance in the competitiveness of firms, forcing executives to focus on their core competencies in digitalization. Hence, we propose that:

H6. The influence of executives' overseas backgrounds on digital transformation may be heterogeneous across regions.

H6a. The influence of executives' overseas education background on digital transformation may be heterogeneous across regions.

H6b. The influence of executives' overseas work backgrounds on digital transformation may be heterogeneous across regions.

In summary, this study examined the correlation and causal relationships between executives' overseas background (overseas education and work experience) and enterprise digital transformation. In particular, we considered employees' education level as a moderator of such effects and created a moderated mediation model by positioning enterprise digital transformation as a mediator of the effect of executives' overseas background on enterprise growth. Furthermore, we considered the heterogeneous effects of the region and the nature of enterprise ownership.

Figure 1 presents the study's theoretical model based on the abovementioned hypotheses.

3. Research design

3.1 Sample

This study covered Chinese A-share companies listed on the Shanghai and Shenzhen Stock Exchanges for the period 2018–2020. The data of executives were manually sorted from their résumés, obtained from the China Stock Market and Accounting Research database, supplemented with disclosures from corporate annual reports and universities' official websites. Data related to digital transformation and employees were calculated by combining information disclosed in annual reports and annual accounting statements and were matched with the data on executives.

The following companies were excluded from the analysis sample as outliers: those from the financial industry; ST and *ST companies because of their high delisting risks; and those with missing observations. These criteria yielded a final sample of 3,720 listed companies. Following Kale and Shahrur (2007), all variables were winsorized at the 1% and 99% percentiles to eliminate the effect of outliers. We used the statistical software STATA v. 15.0 for statistical analysis of the samples.

3.2 Measurement of variables

3.2.1 Overseas background of executives. Enterprise executives refer to the top managers with president or chief executive officer titles, general managers and deputy general managers (Cui *et al.*, 2019). Executives' overseas background (Osea_P) was measured following Herrmann and Datta (2005). To analyze further the characteristics of executives' overseas background, we designed measurement indicators for two dimensions: overseas education (Osea_E) and overseas work experience (Osea_W), represented by the proportion of executives with such backgrounds.

3.2.2 Enterprise digital transformation. Existing research on the digital transformation of enterprises used questionnaires to investigate whether enterprises had adopted digital processes but did not measure the level of digitalization. This study used the proportion of enterprises' fixed and intangible assets employed in the construction of digital resources (Digital A) to measure the digitalization level; this information was obtained from the notes on fixed and intangible assets accompanying the financial statements (Huang *et al.*, 2021).

To check the robustness of our digital transformation measure, we carried out a textual analysis of core competitiveness, the general situation of operations and future development strategy disclosed in annual reports. If an enterprise had adopted artificial intelligence, cloud computing, the Internet of things and other operations related to digitalization, digital transformation was deemed to have taken place (Harvard Business Review Analytic Services, 2017), and the variable was coded "1" and "0" otherwise. We named this variable Digital B and replaced Digital A with it for robustness testing.

3.2.3 Enterprise growth. Considering the state of digital transformation and the rapidly changing competitive environment, we used earnings to measure enterprise growth because it is intuitive, and the growth rate of total assets (TAGR) to measure enterprise growth (Zhao *et al.*, 2010).

3.2.4 Education level of employees. The proportion of employees with a bachelor's degree or above was used as a measure of employees' education level (Edu). Most studies on human capital measurement consider that employees with education below the university level are generally not within the scope of human capital measurement (Barro and Lee, 1993). Therefore, this study adopted the proportion of employees with a bachelor's degree or higher to define the overall education level of employees.

3.2.5 Control variables. To improve the accuracy of the test results, we controlled for the common factors affecting an enterprise's operational and financial performance. We used two firm-level variables, firm size and firm age, as control variables. According to Laukkanen *et al.* (2007), an enterprise's scale is closely related to its resource allocation and organizational structure; therefore, we used the natural logarithm of total assets as a measure of firm size. The number of years of establishment of an enterprise affects its operation and management activities to a certain extent; it is measured as the natural logarithm of the difference between the current year and the year in which the firm initially went public (Huerger and Jaumandreu, 2004).

Three executive-team-level variables – executive size, executive age and executive gender – were also used as control variables. Executive age was measured as the standard deviation of the executive team members' ages. Executive size meant the total number of individuals in an executive team, while executive gender was measured as the proportion of men in the executive team. We also incorporated dummy variables for industry and year to control for fixed effects. All control variables, except for the fixed effects variables, were lagged by one year.

3.3 Estimation models

We categorized executives' overseas background into two components and had three independent variables. We used model (1) to test *H1*, *H1a* and *H1b* and further followed the method of Hirshleifer *et al.* (2012) by controlling for the fixed effects of year and industry in our estimation model. The regression equation was constructed as follows:

$$\begin{aligned} DigitalA_{i,t+1} = & \alpha_0 + \alpha_1(Osea_P/Osea_E/Osea_W)_{i,t} + \Sigma\alpha_k Controls_{i,k,t} + Year_t \\ & + Ind_t + \varepsilon_{i,t} \end{aligned} \quad (1)$$

Based on model (1), we used models (2) and (3) to test *H2*, *H2a* and *H2b* (Baron and Kenny, 1986), and the regression equations were constructed as follows:

$$\begin{aligned} TAGR_{i,t+1} = & \beta_0 + \beta_1(Osea_P/Osea_E/Osea_W)_{i,t} + \Sigma\beta_k Controls_{i,k,t} + Year_t + Ind_t \\ & + \varepsilon_{i,t} \end{aligned} \quad (2)$$

and

$$\begin{aligned} TAGR_{i,t+1} = & \beta_0 + \beta_1(Osea_P/Osea_E/Osea_W)_{i,t} + \beta_2 DigitalA_{i,t} + \Sigma\beta_k Controls_{i,k,t} \\ & + Year_t + Ind_t + \varepsilon_{i,t} \end{aligned} \quad (3)$$

where $DigitalA_{i,t+1}$ represented the digitalization level of the i^{th} enterprise in year $t + 1$; $Npgr_{i,t+1}$ represented the development capacity of the i^{th} enterprise in year $t + 1$; $\Sigma Control$ represented the control variables; and $Year$ and Ind represented the year and industry, respectively.

In the robustness tests, we replaced $DigitalA$ with $DigitalB$ as the enterprise digital transformation measure and used binary logistic regression analysis for hypothesis testing.

4. Data analysis

4.1 Descriptive statistics and correlation matrix

As Table 1 shows, the mean ratio of executives with overseas backgrounds to the total number of members of the executive team ($Osea_P$) was 0.094. The average degree of enterprise digital transformation ($DigitalA$) was 0.061 with a standard deviation of 0.140, which suggests that the level of digitalization varied widely among enterprises. The mean education level of employees (Edu) was 0.333, indicating that overall, the sample of companies had fewer employees with high educational qualifications. In addition, the standard deviation for growth ($TAGR$) indicated a large gap between firms.

Further correlation analysis of the variables showed that the correlation coefficients between variables were all less than 0.5, and the variance inflation factor was much less than 10, indicating no serious problem of multicollinearity among the variables. The correlation coefficient of the relationship between executives' overseas background ($Osea_P$) and enterprise digital transformation ($DigitalA$) was 0.064; that of the relationship between executives' overseas background and enterprise growth ($TAGR$) was 0.038; and that of the relationship between executives' overseas background and employees' education level (Edu) was 0.116. All results were statistically significant at the 1% level. These preliminary results indicate a significant positive correlation between executives' overseas background

Table 1.
Means, standard deviations and the correlation coefficient matrix of variables

Variables	Mean	SD	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) <i>Osea_P</i>	0.094	0.112	1										
(2) <i>Osea_E</i>	0.067	0.090	0.838***	1									
(3) <i>Osea_W</i>	0.046	0.083	0.776***	0.417***	1								
(4) <i>Digital_A</i>	0.061	0.140	0.074***	0.073***	0.045***	1							
(5) <i>TAGR</i>	0.202	0.624	0.038**	0.018	0.063***	0.053***	1						
(6) <i>Edu</i>	0.333	0.240	0.108***	0.117***	0.071***	0.442***	0.001	1					
(7) <i>Firm size</i>	22.375	1.511	0.110***	0.115***	0.070***	0.012	-0.092***	0.223***	1				
(8) <i>Firm age</i>	19.770	5.947	-0.042***	-0.011	-0.078***	-0.057***	-0.128***	0.026	0.180***	1			
(9) <i>Executive size</i>	12.970	3.621	-0.002	-0.013	0.021	0.003	0.024	0.175***	0.424***	0.132***	1		
(10) <i>Executive age</i>	7.722	2.149	0.083***	0.095***	0.053***	-0.015	0.004	-0.087***	-0.210***	-0.075***	-0.152***	1	
(11) <i>Executive gender</i>	0.820	0.126	-0.096***	-0.116***	-0.024	-0.053***	-0.025	0.016	0.183***	0.001	0.160***	-0.135***	1

Note: *, **, and *** denote that the correlations are significant at the 0.1, 0.05 and 0.01 levels, respectively

and enterprise digital transformation, enterprise growth and employees' education level, laying the foundation for subsequent hypothesis testing.

4.2 Influence of executives' overseas background on enterprise digital transformation

Table 2 shows the results of the regression analysis of the influence of executives' overseas background and the two types of subdivisions of enterprise digital transformation. Model (1) resulted in a regression coefficient of the relationship between executives' overseas background (Osea_P) and enterprise digital transformation of 0.069, which was statistically significant at the 1% level, suggesting that executives' overseas background contributed significantly to enterprises' digitalization level, supporting H1. The regression coefficients of the effects of overseas education (Osea_E) and overseas work experience (Osea_W) on enterprise digital transformation (DigitalA) were 0.070 and 0.039, respectively. These findings support H1a and H1b.

4.3 Testing mediating effect of enterprise digital transformation

First, in model (2), the regression coefficient of the relationship between executives' overseas background and enterprise growth (TAGR) was 0.047 (Table 2), which was significant at the 1% level, indicating that the more executives with overseas backgrounds there are in the top management team, the better the financial situation of the enterprise. Second, for model (3), the regression coefficient of the relationship between enterprise digital transformation and enterprise growth was 0.466, which was significant at the 1% level. However, the regression coefficient of the relationship between executives' overseas background and enterprise growth was nonsignificant, indicating that enterprise digital transformation played a completely mediating role in this relationship, supporting H2. In the same way, enterprise digital transformation played a completely mediating role in the relationships between the two types of overseas background of executives and enterprise growth. These findings support H2a and H2b.

Some studies have shown that the three-step method described above for testing mediating effects is not rigorous and may even be seriously biased. Therefore, we used autonomous sampling (bootstrapping) repeated 5,000 times to test the mediating effects further (MacKinnon *et al.*, 2007). Table 3 shows that the mediating effect of executives' overseas background on enterprise growth through the implementation of digital transformation was significant, with a 95% confidence interval of 0.0348–0.0832, excluding 0. Similarly, the mediating effect of executives' overseas education and work experience on enterprise growth through the implementation of digital transformation was significant, with 95% confidence intervals of 0.0503–0.1121 and 0.0199–0.0826, respectively. These results support H2, H2a and H2b.

4.4 Testing moderating effect of employees' education level

We tested the moderating role of employees' education levels in the mediation model. Executives' overseas background was the independent variable; enterprise growth was the dependent variable; enterprise digital transformation was the mediating variable; and employees' education level was the moderating variable. The results of the tests are listed in Table 4. The regression coefficient of the interaction between executives' overseas background and employees' education level (Osea_P*Edu) was 0.187, at a significance level of 0.05, indicating that employees' education level could adjust the promoting effect of executives' overseas background on the digital transformation of enterprises. Meanwhile, the "bias correction confidence interval" of the interaction between executives' overseas background and employees' education level was 0.0099–0.3641, excluding 0, indicating that

Table 2.
Regression results
for the tests of $H1$,
 $H1a$, $H1b$, $H2$, $H2a$
and $H2b$

Variables	DigitalA (1)	(2)	TAGR	(3)
$Osea_P$	0.069*** (4.099)			
$Osea_E$	0.070*** (4.155)	0.031* (1.870)	0.062*** (3.785)	0.015 (0.858)
$Osea_W$				0.018 (1.038)
$DigitalA$		0.047*** (2.836)	0.062*** (3.785)	0.465*** (26.744)
$Firm\ size$	0.008 (0.433)	-0.111*** (-5.780)	-0.109*** (-5.748)	-0.052** (-2.580)
$Firm\ age$	-0.059*** (-3.407)	-0.114*** (-6.689)	-0.111*** (-6.514)	-0.030* (-1.756)
$Executive\ size$	0.007 (0.373)	0.083*** (5.052)	0.091*** (4.940)	-0.016 (-0.802)
$Executive\ age$	-0.030* (-1.694)	-0.029 (-1.640)	-0.028 (-1.602)	0.015 (0.841)
$Executive\ gender$	-0.057*** (-3.337)	-0.014 (-0.830)	-0.017 (-1.022)	-0.029* (-1.652)
$Year$	Yes	Yes	Yes	Yes
$Industry$	Yes	Yes	Yes	Yes
F	6.504***	16.901***	17.825***	93.830***
Adj_R^2	0.012	0.029	0.031	0.207
		0.028		0.207
				93.776***
				93.722***
				0.207

Note: *, **, and *** denote that the correlations are significant at the 0.1, 0.05 and 0.01 levels, respectively

Effect decomposition	<i>Executives' overseas background</i>		Independent variable		<i>Executives' overseas work background</i>	
	Effect	BootLLCI	BootULCI	Effect	BootLLCI	BootULCI
Total effect	0.0772	0.0282	0.1257	0.1093	0.0484	0.1702
Direct effect	0.0192	-0.0246	0.0629	0.0290	-0.0258	0.0838
Indirect effect	0.0578	0.0348	0.0823	0.0803	0.0503	0.1121

Note: LLCI = lower limit confidence interval; ULCI = upper limit confidence interval

Table 3.
Decomposition of the total, direct and mediating effects

Table 4.
Results of the test of *H3* on the moderating effect of the education level of employees

Outcome variable	Predictive variable	Standardization regression coefficient	SE	<i>t</i>	95% confidence interval			<i>R</i> ²	<i>F</i>
					LLCI	ULCI			
<i>DigitalA</i>	<i>Firm size</i>	-0.0052	0.0020	-2.6341***	-0.0090	-0.0013	0.2104	83.9293***	
	<i>Firm age</i>	-0.0007	0.00004	-1.7671*	-0.0016	0.0001			
	<i>Executive size</i>	-0.0006	0.0008	-0.7950	-0.0021	0.0009			
	<i>Executive age</i>	0.0011	0.0012	0.8980	-0.0013	0.0034			
	<i>Executive gender</i>	-0.0341	0.0197	-1.7338*	-0.0727	0.0045			
	<i>Osea_P</i>	0.0141	0.0225	0.6259	-0.0300	0.0581			
	<i>Edu</i>	0.2897	0.0109	26.6282***	0.2683	0.3110			
	<i>Osea_P*Edu</i>	0.1870	0.0903	2.0704**	0.0099	0.3641			

the moderating effect of employees' education level was significant; therefore, *H3* is supported.

We then replaced executives' overseas background with executives' overseas education and overseas work experience as independent variables and repeated the procedures. The results in [Table 5](#) show that the regression coefficient of the interaction between executives' overseas education and employees' education level ($Osea_E * Edu$) was 0.2985, which was significant at the 0.01 level, supporting *H3a*. However, as shown in [Table 6](#), the regression coefficient of the interaction between executives' overseas work experience and employees' educational level ($Osea_W * Edu$) was not significant; therefore, this result does not support *H3b*.

To demonstrate this moderating effect more clearly, schematic diagrams of the moderating effects (the benchmark was the mean ± 1 standard deviation) are shown in [Figures 2](#) and [3](#). As these figures show, for enterprises equipped with highly educated employees, executives' overseas background and their overseas education had a stronger impact on enterprise digital transformation.

We further tested whether there was a conditional indirect effect, that is, whether the effect varied depending on the level of the moderator variable ([Hayes and Preacher, 2013](#)). As shown in [Table 7](#), when employees' education level was low, enterprise digital transformation had a mediating effect, and the indirect effect was 0.0569 ($p < 0.01$). However, when employees' education level was high, the indirect effect was 0.0935 ($p < 0.01$). Further comparison of the indirect effects showed that the difference between high and low levels of employee education also reached a significant level (index = 0.2819, [0.1326, 0.4596]), indicating that the level of employees' education strengthened the indirect effects of enterprise digital transformation on the effect of executives' overseas background on enterprise growth. Similarly, when we replaced executives' overseas background with executives' overseas education and overseas work experience as the independent variable, the difference between the high and low levels of education of employees was also significant (index = 0.3928, [0.1990, 0.6243]; index = 0.2251, [0.0381, 0.4300]). When the level of employees' education was low (high), the indirect effect of enterprise digital transformation on the effect of executives' education or work experience on enterprise growth was weak (strong). Thus, *H4*, *H4a* and *H4b* are supported.

4.5 Testing for heterogeneity of enterprise ownership nature and region

To explore further the influence of the nature of corporate ownership on the relationship between executives' overseas background and enterprise digital transformation, we divided the whole sample into state-owned enterprises (State = 1) and non-state-owned enterprises (State = 0) according to the nature of the controlling shareholders of the enterprises and then performed a regression analysis of the subgroups. As shown in [Table 8](#), the regression coefficients of executives' overseas background ($Osea_P$), overseas education ($Osea_E$) and overseas work experience ($Osea_W$) were 0.049 ($p > 0.1$), 0.079 ($p < 0.01$) and 0.012 ($p > 0.1$), respectively, for state-owned enterprises, and 0.080 ($p < 0.01$), 0.066 ($p < 0.01$) and 0.047 ($p < 0.05$), respectively, for non-state-owned enterprises. These results indicate that the positive effect of executives' overseas background on enterprise digital transformation is significantly dependent on the nature of corporate ownership.

To explore further the influence of regional differences on the relationship between executives' overseas background and enterprise digital transformation, we divided the whole sample into eastern enterprises (Region = 1) and non-eastern enterprises (Region = 0) according to the classification of the Chinese National Bureau of Statistics and performed regression analysis for the subgroups. As shown in [Table 8](#), the regression coefficients of

Table 5.
Results of the test of *H3a* on the moderating effect of the education level of employees

Outcome variable	Predictive variable	Standardization regression coefficient	SE	<i>t</i>	95% confidence interval		<i>R</i> ²	<i>F</i>
					LLCI	ULCI		
<i>DigitalA</i>	<i>Firm size</i>	-0.0053	0.0020	-2.7016***	-0.0091	-0.0015	0.2114	84.4082***
	<i>Firm age</i>	-0.0008	0.0004	-1.8122*	-0.0016	0.0001		
	<i>Executive size</i>	-0.0006	0.0008	-0.7775	-0.0021	0.0009		
	<i>Executive age</i>	0.0010	0.0012	0.8514	-0.0013	0.0034		
	<i>Executive gender</i>	-0.0334	0.0197	-1.6902*	-0.0721	0.0053		
	<i>Osea_E</i>	-0.0821	0.0496	-1.6566*	-0.1793	0.0151		
	<i>Edu</i>	0.2686	0.0136	19.7343***	0.2419	0.2953		
	<i>Osea_E* Edu</i>	0.2985	0.1101	2.7116***	0.0827	0.5144		

Outcome variable	Predictive variable	Standardization regression coefficient	SE	<i>t</i>	95% confidence interval		<i>R</i> ²	<i>F</i>
					LICI	ULCI		
<i>DigitalA</i>	<i>Firm size</i>	-0.0046	0.0019	-2.3509**	-0.0084	-0.0008	0.2093	83.3708***
	<i>Ownership</i>	-0.0137	0.0064	-2.1353**	-0.0263	-0.0011		
	<i>Firm age</i>	-0.0007	0.0004	-1.7551*	-0.0016	0.0001		
	<i>Executive size</i>	-0.0006	0.0008	-0.8098	-0.0021	0.0009		
	<i>Executive age</i>	0.0011	0.0012	0.9158	-0.0012	0.0034		
	<i>Executive gender</i>	-0.0351	0.0196	-1.7901*	-0.0736	0.0033		
	<i>Osea_W</i>	0.0179	0.0547	0.3274	-0.0894	0.1253		
	<i>Edu</i>	0.2974	0.0124	23.9358***	0.2730	0.3217		
	<i>Osea_W* Edu</i>	-0.1043	0.1290	-0.8087	-0.3572	0.1486		

Executives'
overseas
background

Table 6.
Results of the test of
H3b on the
moderating effect of
the education level of
employees

Osea_P, Osea_E and Osea_W were 0.065 ($p < 0.01$), 0.068 ($p < 0.01$) and 0.041 ($p < 0.05$), respectively, for eastern enterprises, and 0.057 ($p < 0.1$), 0.062 ($p < 0.1$) and 0.006 ($p > 0.1$), respectively, for non-eastern enterprises. These results indicate that the positive effect of executives' overseas background on enterprise digital transformation varies significantly among the different regions.

4.6 Robustness tests

Tables 9–11 report the estimates obtained using our second measure of enterprise digital transformation. This measure was based on textual analysis of corporate annual reports. First, given that the dependent variable was dichotomous, a binary logistic regression method was used to test H1, H1a and H1b. Table 9 shows that the coefficient of Osea_P was significantly positive, indicating that executives' overseas background promoted enterprise digital transformation.

Second, given that the dependent variable was continuous, ordinary least squares regression was used to test H2, H2a and H2b. Table 10 shows a significantly positive coefficient of DigitalB, while the coefficients of Osea_P and Osea_E were statistically nonsignificant, and the coefficient of Osea_W decreased from 0.062 in model (2) to 0.054 (see Table 2). These results indicate that enterprise digital transformation played a completely mediating role in the relationship between executives' overseas background or overseas education and enterprise growth, while enterprise digital transformation played a partial

Figure 2. Moderating effect of the education level of employees (Edu) on executives' overseas background and the digital transformation of enterprises

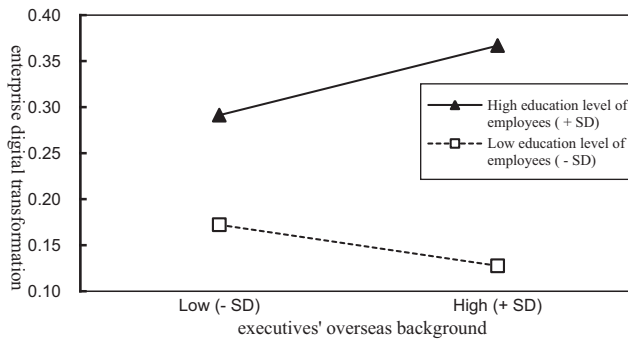
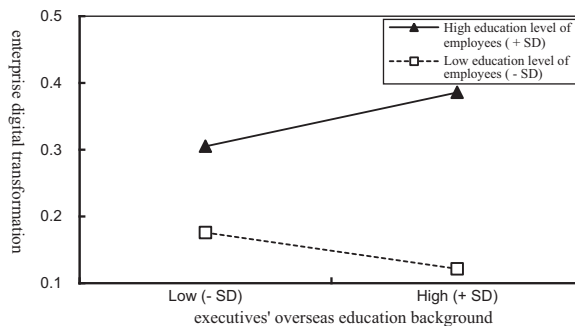


Figure 3. Moderating effect of the education level of employees (Edu) on executives' overseas education background and the digital transformation of enterprises



mediating role in the relationship between executives' overseas work experience and enterprise growth.

Third, given that the dependent variable was dichotomous, binary logistic regression was used to test *H3*, *H3a* and *H3b*. Table 11 shows that the coefficient of the interaction between executives' overseas background and the employees' education level (*Osea_P***Edu*) was positive and significant, indicating that employees' education level positively moderated the association between executives' overseas background and enterprise digital transformation (Baron and Kenny, 1986).

Overall, the estimates obtained through alternative model specification and alternative measures of variables were qualitatively similar to the prior estimates, thus confirming the robustness of the main findings.

5. Conclusions and implications

5.1 Conclusions

We investigated the roles of executives' overseas education and work experience and employees' education level in enterprise digital transformation and enterprise growth, focusing on the effects of these variables' interactions. Our analysis of 2018–2020 data on 3,720 A-share companies listed on China's Shanghai and Shenzhen Stock Exchanges revealed the following.

First, as hypothesized, both executives' overseas education and work experience showed significant positive relationships with enterprise digital transformation, indicating that the greater the proportion of executives with overseas experience, the higher an enterprise's level of digital transformation.

Second, both executives' overseas education and work experience significantly improved enterprise growth. Further analysis of the mechanism revealed that executives' overseas background contributed to enterprise growth mainly through digital transformation (i.e. the mediation effect), suggesting that executive attention and investment in digital transformation may accelerate the growth of enterprises.

Third, in companies where employees are highly (lowly) educated, the effect of executives' overseas education on enterprise digital transformation was strong (weak). However, the moderating effect of employees' education level on the relationship between executives' overseas work experience and enterprise digital transformation was statistically nonsignificant, likely because executives with extensive work experience place more emphasis on the practical skills of their employees than on their education level.

Independent variable	Level of education (Edu)	Conditional indirect effect			Index of moderated mediation				
		Effect	SE	95% CI	INDEX	SE	95% CI		
<i>Osea_P</i>	-1SD	0.0569	0.0151	0.0284	0.0881	0.2819	0.0828	0.1326	0.4596
	mean	0.0729	0.0192	0.0363	0.1120				
	+1SD	0.0935	0.0247	0.0463	0.1444				
<i>Osea_E</i>	-1SD	0.0791	0.0193	0.0425	0.1188	0.3928	0.1075	0.1990	0.6243
	mean	0.1014	0.0244	0.0550	0.1505				
	+1SD	0.1301	0.0315	0.0704	0.1944				
<i>Osea_W</i>	-1SD	0.0461	0.0194	0.0084	0.0851	0.2251	0.0982	0.0381	0.4300
	mean	0.0589	0.0246	0.0106	0.1080				
	+1SD	0.0753	0.0315	0.0136	0.1383				

Table 7. Moderating effect of education level (high or low) of employees (Edu)

Note: CI = Confidence-interval

Table 8.
Regression results of
the extended
research

Variables	State = 1		State = 0	
<i>Osea_P</i>	0.049 (1.614)		0.080*** (3.704)	0.066*** (3.072)
<i>Osea_E</i>		0.079*** (2.626)		
<i>Osea_W</i>			0.012 (0.413)	
<i>Firm size</i>	0.023 (0.711)	0.016 (0.483)	0.031 (0.980)	-0.053*** (-2.344)
<i>Firm age</i>	-0.084*** (-2.864)	-0.088*** (-2.998)	-0.082*** (-2.795)	-0.026 (-1.204)
<i>Executive size</i>	0.052* (1.678)	0.055* (1.765)	0.051 (1.641)	-0.016 (-0.729)
<i>Executive age</i>	0.066** (2.207)	0.062** (2.063)	0.071** (2.376)	-0.079*** (-3.687)
<i>Executive gender</i>	-0.102*** (-3.355)	-0.099*** (-3.261)	-0.105*** (-3.474)	-0.016 (-0.758)
<i>Year</i>	Yes	Yes	Yes	Yes
<i>Industry</i>	Yes	Yes	Yes	Yes
<i>F</i>	5.398***	6.132***	4.918***	5.227***
<i>Adj_R2</i>	0.028	0.031	0.020	0.012
			0.013	0.009
			5.947***	4.460***
			0.016 (-0.756)	-0.023 (-1.075)
			Yes	Yes
			Yes	Yes
			Yes	Yes
			Yes	Yes

Note: *, ** and *** denote that the correlations are significant at the 0.1, 0.05 and 0.01 levels, respectively

(continued)

Variables	Region = 1	Region = 0
<i>Osea_P</i>	0.065*** (3.270)	0.057* (1.797)
<i>Osea_E</i>		0.062* (1.952)
<i>Osea_W</i>	0.068*** (3.409)	
<i>Firm size</i>	-0.003 (-0.149)	0.036 (1.035)
<i>Firm age</i>	-0.060*** (-3.033)	-0.030 (-0.948)
<i>Executive size</i>	-0.002 (-0.071)	0.045 (1.325)
<i>Executive age</i>	-0.047** (-2.367)	0.006 (0.197)
<i>Executive gender</i>	-0.038* (-1.920)	-0.097*** (-3.011)
<i>Year</i>	Yes	Yes
<i>Industry</i>	Yes	Yes
<i>F</i>	4.982***	2.864***
<i>Adj_R2</i>	0.011	0.017
		0.009
	5.138***	2.963***
	0.012	0.017
		0.006 (0.193)
		0.044 (1.276)
		-0.030 (-0.957)
		0.041 (1.214)
		0.012 (0.376)
		-0.103*** (-3.193)
	Yes	Yes
	Yes	Yes
	2.325**	2.325**
	0.014	0.014

Executives'
overseas
background

Table 8.

CMS

We further tested the indirect effect of enterprise digital transformation on the relationship between executives' overseas background and enterprise growth and found that employees' educational level played a moderating role in the conditional indirect effects of enterprise digital transformation for both overseas education and work experience.

Finally, we considered the moderating effect of the external environment and found that in the eastern region of China, characterized by more intense competition and abundant resources, the overseas background of executives had a stronger promoting effect on enterprise digital transformation. Moreover, we found that the promoting effect of

Table 9. Binary logistic regression analysis of the factors associated with enterprise digital transformation

Variable	B	SE	Wald χ^2	P	OR	95% CI
<i>Osea_P</i>	1.415	0.362	15.250	<0.001	4.118	(2.024, 8.378)
<i>Firm size</i>	0.075	0.031	5.809	0.016	1.078	(1.01, 1.146)
<i>Firm age</i>	-0.029	0.007	15.957	<0.001	0.972	(0.958, 0.986)
<i>Executive size</i>	-0.003	0.012	0.053	0.818	0.997	(0.974, 1.021)
<i>Executive age</i>	0.005	0.019	0.080	0.777	1.005	(0.968, 1.044)
<i>Executive gender</i>	-0.433	0.314	1.896	0.169	0.649	(0.350, 1.201)

Notes: SE = standard error; CI = confidence interval

Table 10. Ordinary least squares regression analysis of the meditating effect of enterprise digital transformation

Variable	TAGR (3)		
<i>Osea_P</i>	0.028 (1.460)		
<i>Osea_E</i>		-0.003 (-0.156)	
<i>Osea_W</i>			0.054*** (2.849)
<i>DigitalB</i>	0.040** (2.146)	0.043** (2.265)	0.041** (2.170)
<i>Firm size</i>	-0.062*** (-2.823)	-0.056** (-2.546)	-0.063*** (-2.871)
<i>Firm age</i>	-0.069*** (-3.577)	-0.070*** (-3.592)	-0.066*** (-3.424)
<i>Executive size</i>	0.071*** (3.309)	0.071*** (3.300)	0.069*** (3.196)
<i>Executive age</i>	-0.019 (-0.967)	-0.018 (-0.886)	-0.019 (-0.930)
<i>Executive gender</i>	0.018 (0.927)	0.015 (0.780)	0.016 (0.811)
<i>Year</i>	Yes	Yes	Yes
<i>Industry</i>	Yes	Yes	Yes
<i>F</i>	4.593***	4.327***	5.351***
<i>Adj_R²</i>	0.010	0.009	0.012

Note: *, ** and *** denote that the correlations are significant at the 0.1, 0.05 and 0.01 levels, respectively

Table 11. Binary logistic regression analysis of the moderating effect of the education level of employees

Variables	B	SE	Wald χ^2	P	OR	95% CI
<i>Osea_P</i>	2.233	0.566	0.170	0.001	1.263	(0.416, 3.829)
<i>Edu</i>	1.613	0.243	44.161	<0.001	5.018	(3.119, 8.076)
<i>Osea_P* Edu</i>	3.156	1.198	6.938	0.018	23.482	(2.243, 245.872)
<i>Firm size</i>	0.074	0.032	5.376	0.093	1.077	(1.012, 1.147)
<i>Firm age</i>	-0.027	0.007	14.017	<0.001	0.973	(0.959, 0.987)
<i>Executive size</i>	-0.010	0.020	1.343	0.432	0.690	(0.368, 1.293)
<i>Executive age</i>	-0.006	0.321	0.208	0.296	0.994	(0.970, 1.019)
<i>Executive gender</i>	-0.242	0.013	0.157	0.133	1.008	(0.970, 1.047)

executives' overseas background on enterprise digital transformation was more significant in non-state-owned enterprises. In summary, our study makes important contributions to the literature on enterprise digital transformation and enterprise growth from a human capital perspective.

5.2 Theoretical implications

This study makes a number of related theoretical contributions in extending our knowledge of executive characteristics and digital transformation in general. First, it is in line with the upper echelons theory and enriches it by focusing on how the background characteristics of executives affect enterprise growth in terms of firm transformation. Most previous empirical studies have focused on the benefits of the digital economy and digital technologies on firm performance (Guo and Xu, 2021) but neglected the factors influencing the enterprise's digital transformation. In particular, little work has been done on considering the internal human resources that may address digital inefficiencies and low success rates. Executives' factors are integral when considering firm transformation (Stief *et al.*, 2016), and thus examining executive background characteristics and competencies as factors affecting an enterprise's digital transformation is relevant to this debate. Executives have to deal with many complex and uncertain problems (Hambrick, 1994), and critical transition decisions are important to the survival and success of their enterprises. Indeed, we found that in a dynamic context of continuous digital technology change and rapidly changing economic conditions, the enhanced competencies of executives from their overseas experiences are beneficial to the digital transformation in their firms. This enriches the research on the factors influencing an enterprise's digital transformation.

Our research also enhances the dynamic capabilities literature. Based on the dynamic managerial capabilities proposed by Adner and Helfat (2003), we found that the overseas background of executives is closely related to the three underlying sources of dynamic managerial capabilities. Executives' overseas education or work experiences directly or indirectly act on their cognition, human capital and social capital. This research extends the understanding of dynamic capabilities from the micro firm-level perspective, while indirectly empirically demonstrating that dynamic managerial capabilities are crucial for executives in transforming their enterprises digitally.

Second, this study further explores the executives' overseas background–enterprise growth relationship; the evidence for enterprise digital transformation as a mediator helps elucidate the mechanism by which executives' overseas background improves firm growth. The mechanism of enterprise transformation has not been previously studied as the process through which executives with overseas backgrounds can impact firm growth. Our findings suggest a new role for executives, as the facilitator of enterprise digital transformation. Although some upper echelons studies have revealed a positive direct effect of executives' overseas background on firm performance (Zhang and Fu, 2020), the role of facilitator of enterprise transformation has been insufficiently investigated. Our study examines enterprise growth in light of digital transformation to explain the background characteristics needed by executives that might facilitate digital transformation to accelerate enterprise growth, instead of reducing personal decision risk at the expense of enterprise growth.

Third, owing to the effect of internal environment factors such as employee characteristics, the processes by which executives' overseas background affects enterprise transformation and the ways in which transformation promotes enterprise growth are more complicated than prior studies have suggested. The positive relationship appealed above may actually change in the face of a low level of employee education. In other words, the relationships between executives' overseas background, enterprise digital transformation

and enterprise growth are dependent on employee factors. In particular, prior research has paid insufficient attention to the moderating effect of such factors on the relationship between executives' overseas background and enterprise transformation. Highly educated workers tend to be more proactive in their use of digital technology, and their use tends to be information-oriented rather than recreational (Bonfadelli, 2002). Therefore, the education level of employees as a moderating variable in this study deepens our understanding of the boundaries of the relationship between executives' overseas background and enterprise digital transformation and growth.

Fourth, when examining enterprises of different ownership nature and regions separately, executives' overseas backgrounds are more conducive to digital transformation in non-state enterprises and enterprises in the comparatively more developed Eastern region. This might imply that digital transformation, as a market strategy, is more dependent on market dynamism and certain competitive pressures.

5.3 Practical implications

This study explored the factors influencing enterprise digital transformation at the microlevel of corporate human capital and provided microlevel empirical evidence for the factors influencing enterprise digital transformation. It also identifies implications for China in promoting enterprise digital transformation in terms of corporate human resources planning and offers a new way of thinking for enhancing enterprise digital transformation and growth.

As the demographic dividend and scale effect of China's economy are gradually weakening, organizational transformation and business upgrading with digital technology become inevitable. Our findings add another layer to our understanding of how enterprises via optimization and disposition of human resources make critical adjustments to digital transformation in the face of increasing risk and uncertainties. For instance, digital transformation can be significantly improved when companies pay attention to individuals' overseas backgrounds when building executive teams; recruit and match highly qualified individuals to the positions required for digital transformation; increasingly absorb high-level talent with international experience, particularly for companies in central and western China, to promote coordinated development in digital economy; and encourage executives with an overseas background to develop their creativity and participate in digital transformation, particularly in the state-owned enterprises. Furthermore, the government should help develop the capacities of executives in state-owned enterprises and pay attention to talents with overseas backgrounds to enhance the quality and efficiency of digital economic development at the macro level.

5.4 Limitations and future research

We acknowledge several limitations of our study and identify opportunities for future research. First, the enterprise digital transformation measures we used are dependent on the digital financial input of fixed assets and intangible assets of enterprises, which may be a crude way to describe their engagement in digital transformation and may capture the real impact of their activities only partially.

Second, although we coded the annual reports of enterprises in our robustness check, especially the growth strategy section, we did not differentiate between the types of digital transformation, which differed considerably among industries. A more accurate approach is to determine the degree of digital transformation for the same types of digital transformation. We aim to conduct a more in-depth study through interviews.

Third, the relationship between executives' overseas background and enterprise digital transformation is quite complicated, because the two variables are not only mutually influencing but also affected by some common factors. Consistent with previous studies, we included a one-year lag between executives' overseas background and enterprise digital transformation to capture the influence of the former on the latter and controlled for some lagged variables to address the potential endogeneity problem (Wooldridge, 2015). Nevertheless, this problem might not be fully resolved by these methods, and future research should use longitudinal data covering a longer time span to identify a causal relationship more appropriately.

Finally, this study emphasizes the factors of executives' overseas background as an important determinant in strategy formulation and decision-making of enterprise digital transformation. Future research should further explore the effects of other determinants of digital transformation and their influencing mechanisms, including the specific factors that lead to the heterogeneous effect of executives' overseas backgrounds on digital transformation in enterprises of different regions and different ownerships.

References

- Adner, R. and Helfat, C.E. (2003), "Corporate effects and dynamic managerial capabilities", *Strategic Management Journal*, Vol. 24 No. 10, pp. 1011-1025.
- Baron, R.M. and Kenny, D.A. (1986), "The moderator–mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations", *Journal of Personality and Social Psychology*, Vol. 51 No. 6, p. 1173.
- Barro, R.J. and Lee, J.W. (1993), "International comparisons of educational attainment", *Journal of Monetary Economics*, Vol. 32 No. 3, pp. 363-394.
- Becker, G.S. (2009), *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*, University of Chicago press, Chicago.
- Bharadwaj, A.S. (2000), "A resource-based perspective on information technology capability and firm performance: an empirical investigation", *MIS Quarterly*, Vol. 24 No. 1, pp. 169-196.
- Bharadwaj, A., El Sawy, O.A., Pavlou, P.A. and Venkatraman, N.V. (2013), "Digital business strategy: toward a next generation of insights", *MIS Quarterly*, Vol. 37 No. 2, pp. 471-482.
- Björkdahl, J. (2020), "Strategies for digitalization in manufacturing firms", *California Management Review*, Vol. 62 No. 4, pp. 17-36.
- Bonfadelli, H. (2002), "The internet and knowledge gaps: a theoretical and empirical investigation", *European Journal of Communication*, Vol. 17 No. 1, pp. 65-84.
- Borensztein, E., De Gregorio, J. and Lee, J.W. (1998), "How does foreign direct investment affect economic growth?", *Journal of International Economics*, Vol. 45 No. 1, pp. 115-135.
- Bouncken, R.B., Kraus, S. and Roig-Tierno, N. (2021), "Knowledge-and innovation-based business models for future growth: digitalized business models and portfolio considerations", *Review of Managerial Science*, Vol. 15 No. 1, pp. 1-14.
- Bouquet, C. and Birkinshaw, J. (2011), "How global strategies emerge: an attention perspective", *Global Strategy Journal*, Vol. 1 Nos 3/4, pp. 243-262.
- Breidbach, C.F., Keating, B.W. and Lim, C. (2019), "Fintech: research directions to explore the digital transformation of financial service systems", *Journal of Service Theory and Practice*, Vol. 30 No. 1, pp. 79-102.
- Capozza, C. and Divella, M. (2019), "Human capital and firms' innovation: evidence from emerging economies", *Economics of Innovation and New Technology*, Vol. 28 No. 7, pp. 741-757.
- Caputo, F., Evangelista, F., Perko, I. and Russo, G. (2017), "The role of big data in value co-creation for the knowledge economy", *10th Annual Conference of the EuroMed Academy of Business*.

-
- Choi, S.B., Lee, S.H. and Williams, C. (2011), "Ownership and firm innovation in a transition economy: evidence from China", *Research Policy*, Vol. 40 No. 3, pp. 441-452.
- Cichosz, M., Wallenburg, C.M. and Knemeyer, A.M. (2020), "Digital transformation at logistics service providers: barriers, success factors and leading practices", *The International Journal of Logistics Management*, Vol. 31 No. 2, pp. 209-238.
- Claessens, S. and Laeven, L. (2003), "Financial development, property rights, and growth", *The Journal of Finance*, Vol. 58 No. 6, pp. 2401-2436.
- Collin, J., Hiekkanen, K., Korhonen, J.J., Halén, M., Itälä, T. and Helenius, M. (2015), *IT Leadership in transition-The Impact of Digitalization on Finnish Organizations*, Aalto University publication, Finland.
- Correani, A., De Massis, A., Frattini, F., Petruzzelli, A.M. and Natalicchio, A. (2020), "Implementing a digital strategy: learning from the experience of three digital transformation projects", *California Management Review*, Vol. 62 No. 4, pp. 37-56.
- Cortellazzo, L., Bruni, E. and Zampieri, R. (2019), "The role of leadership in a digitalized world: a review", *Frontiers in Psychology*, Vol. 10, p. 1938.
- Cozzolino, A., Verona, G. and Rothaermel, F.T. (2018), "Unpacking the disruption process: new technology, business models, and incumbent adaptation", *Journal of Management Studies*, Vol. 55 No. 7, pp. 1166-1202.
- Cui, Y., Zhang, Y., Guo, J., Hu, H. and Meng, H. (2019), "Top management team knowledge heterogeneity, ownership structure and financial performance: evidence from Chinese IT listed companies", *Technological Forecasting and Social Change*, Vol. 140, pp. 14-21.
- Denicolai, S., Zucchella, A. and Magnani, G. (2021), "Internationalization, digitalization, and sustainability: are SMEs ready? A survey on synergies and substituting effects among growth paths", *Technological Forecasting and Social Change*, Vol. 166, p. 120650.
- Di Vaio, A., Palladino, R., Pezzi, A. and Kalisz, D.E. (2021), "The role of digital innovation in knowledge management systems: a systematic literature review", *Journal of Business Research*, Vol. 123, pp. 220-231.
- Diener, F. and Špaček, M. (2021), "Digital transformation in banking: a managerial perspective on barriers to change", *Sustainability*, Vol. 13 No. 4, p. 2032.
- Ferreira, J.J., Fernandes, C.I. and Ferreira, F.A. (2019), "To be or not to be digital, that is the question: firm innovation and performance", *Journal of Business Research*, Vol. 101, pp. 583-590.
- Fischer, M., Imgrund, F., Janiesch, C. and Winkelmann, A. (2020), "Strategy archetypes for digital transformation: defining meta objectives using business process management", *Information and Management*, Vol. 57 No. 5, p. 103262.
- Furman, J.L. and Teodoridis, F. (2020), "Automation, research technology, and researchers' trajectories: evidence from computer science and electrical engineering", *Organization Science*, Vol. 31 No. 2, pp. 330-354.
- Giannetti, M., Liao, G. and Yu, X. (2015), "The brain gain of corporate boards: evidence from China", *The Journal of Finance*, Vol. 70 No. 4, pp. 1629-1682.
- Goldin, C. and Katz, L.F. (1996), "Technology, skill, and the wage structure: insights from the past", *The American Economic Review*, Vol. 86 No. 2, pp. 252-257.
- Gölzer, P. and Fritzsche, A. (2017), "Data-driven operations management: organisational implications of the digital transformation in industrial practice", *Production Planning and Control*, Vol. 28 No. 16, pp. 1332-1343.
- Guo, L. and Xu, L. (2021), "The effects of digital transformation on firm performance: evidence from China's manufacturing sector", *Sustainability*, Vol. 13 No. 22, p. 12844.
- Hambrick, D.C. (1994), "Top management groups: a conceptual integration and reconsideration of the 'team' label", *Research in Organizational Behavior*, Vol. 16, pp. 171-171.

-
- Hambrick, D.C. and Mason, P.A. (1984), "Upper echelons: the organization as a reflection of its top managers", *The Academy of Management Review*, Vol. 9 No. 2, pp. 193-206.
- Harvard Business Review Analytic Services (2017), *Operationalizing Digital Transformation: New Insights into Making Digital Work*, Harvard Business School Publishing, Brighton, Vol. 5, pp. 1-12.
- Hayes, A.F. and Preacher, K.J. (2013), *Conditional Process Modeling: Using Structural Equation Modeling to Examine Contingent Causal Processes*, American Psychological Association, Washington, DC.
- Helfat, C.E. and Martin, J.A. (2015), "Dynamic managerial capabilities: review and assessment of managerial impact on strategic change", *Journal of Management*, Vol. 41 No. 5, pp. 1281-1312.
- Herhausen, D., Kleinerlcher, K., Verhoef, P.C., Emrich, O. and Rudolph, T. (2019), "Loyalty formation for different customer journey segments", *Journal of Retailing*, Vol. 95 No. 3, pp. 9-29.
- Herrmann, P. and Datta, D.K. (2005), "Relationships between top management team characteristics and international diversification: an empirical investigation", *British Journal of Management*, Vol. 16 No. 1, pp. 69-78.
- Hirshleifer, D., Low, A. and Teoh, S.H. (2012), "Are overconfident CEOs better innovators?", *The Journal of Finance*, Vol. 67 No. 4, pp. 1457-1498.
- Huang, J.G., Ji, X.X. and Li, Y.X. (2021), "The impact of digitalization on firm innovation performance: empirical evidence from Shanghai and Shenzhen a-share listed companies", *Jiangxi Social Sciences*, Vol. 41 No. 5, pp. 254-255, (Chinese Journal).
- Huergo, E. and Jaumandreu, J. (2004), "How does probability of innovation change with firm age?", *Small Business Economics*, Vol. 22 Nos 3/4, pp. 193-207.
- Iansiti, M. and Richards, G. (2020), *Coronavirus is Widening the Corporate Digital Divide*, Harvard Business Review, Boston.
- Jackson, N.C. and Dunn-Jensen, L.M. (2021), "Leadership succession planning for today's digital transformation economy: key factors to build for competency and innovation", *Business Horizons*, Vol. 64 No. 2, pp. 273-284.
- Jeansson, J. and Bredmar, K. (2019), "Digital transformation of SMEs: capturing complexity", *32nd Bled eConference: Humanizing Technology for a Sustainable Society*, University of Maribor Press, Slovenia, pp. 523-541.
- Juliani, T. and Windu, F.S. (2017), "Analysis of incentive, work discipline, and education levels that influence employee performance", *Jurnal Aplikasi Manajemen*, Vol. 15 No. 2, pp. 355-361.
- Kale, J.R. and Shahrur, H. (2007), "Corporate capital structure and the characteristics of suppliers and customers", *Journal of Financial Economics*, Vol. 83 No. 2, pp. 321-365.
- Kamalaldin, A., Linde, L., Sjödin, D. and Parida, V. (2020), "Transforming provider-customer relationships in digital servitization: a relational view on digitalization", *Industrial Marketing Management*, Vol. 89, pp. 306-325.
- Kane, G.C., Palmer, D., Phillips, A.N., Kiron, D. and Buckley, N. (2015), "Strategy, not technology, drives digital transformation", *MIT Sloan Management Review and Deloitte University Press*, Vol. 14, pp. 1-25.
- Kapur, D. and McHale, J. (2005), *The Global Migration of Talent: What Does It Mean for Developing Countries*, CGD Brief, Washington, DC.
- Kim, S., Choi, B. and Lew, Y.K. (2021), "Where is the age of digitalization heading? The meaning, characteristics, and implications of contemporary digital transformation", *Sustainability*, Vol. 13 No. 16, p. 8909.
- Laukkanen, S., Sarpola, S. and Hallikainen, P. (2007), "Enterprise size matters: objectives and constraints of ERP adoption", *Journal of Enterprise Information Management*, Vol. 20 No. 3, pp. 319-334.

-
- Lemon, K.N. and Verhoef, P.C. (2016), "Understanding customer experience throughout the customer journey", *Journal of Marketing*, Vol. 80 No. 6, pp. 69-96.
- Li, H., Zhang, Y., Li, Y., Zhou, L.A. and Zhang, W. (2012), "Returnees versus locals: who perform better in China's technology entrepreneurship?", *Strategic Entrepreneurship Journal*, Vol. 6 No. 3, pp. 257-272.
- Li, Y., Guo, H., Yi, Y. and Liu, Y. (2010), "Ownership concentration and product innovation in Chinese firms: the mediating role of learning orientation", *Management and Organization Review*, Vol. 6 No. 1, pp. 77-100.
- Libert, B., Beck, M. and Wind, Y. (2016), "Questions to ask before your next digital transformation", *Harvard Business Review*, Vol. 60 No. 12, pp. 11-13.
- Liu, J., Chang, H., Forrest, J.Y.L. and Yang, B. (2020), "Influence of artificial intelligence on technological innovation: evidence from the panel data of China's manufacturing sectors", *Technological Forecasting and Social Change*, Vol. 158, p. 120142.
- Liu, X., Chen, J., Xie, Y. and Wu, D. (2016), "Strategic transformation through innovation in emerging industry: a case study", *International Journal of Technology Management*, Vol. 72 Nos 1/3, pp. 192-209.
- Liu, X.Z. (2016), "Analysis on the development trend of Chinese students studying abroad and returning to China", *Chinese Administration*, Vol. 2016 No. 1, pp. 52-57, (Chinese Journal).
- Lucas, H., Jr, Agarwal, R., Clemons, E.K., El Sawy, O.A. and Weber, B. (2013), "Impactful research on transformational information technology: an opportunity to inform new audiences", *MIS Quarterly*, Vol. 37 No. 2, pp. 371-382.
- MacKinnon, D.P., Fairchild, A.J. and Fritz, M.S. (2007), "Mediation analysis", *Annual Review of Psychology*, Vol. 58 No. 1, pp. 593-614.
- Marolt, M., Zimmermann, H.D. and Pucihar, A. (2020), "Enhancing marketing performance through enterprise-initiated customer engagement", *Sustainability*, Vol. 12 No. 9, p. 3931.
- Müller, J.M., Buliga, O. and Voigt, K.I. (2018), "Fortune favors the prepared: how SMEs approach business model innovations in industry 4.0", *Technological Forecasting and Social Change*, Vol. 132, pp. 2-17.
- Nadkarni, S. and Barr, P.S. (2008), "Environmental context, managerial cognition, and strategic action: an integrated view", *Strategic Management Journal*, Vol. 29 No. 13, pp. 1395-1427.
- Pagoropoulos, A., Maier, A. and McAlone, T.C. (2017), "Assessing transformational change from institutionalising digital capabilities on implementation and development of product-service systems: learnings from the maritime industry", *Journal of Cleaner Production*, Vol. 166, pp. 369-380.
- Paiola, M. and Gebauer, H. (2020), "Internet of things technologies, digital servitization and business model innovation in BtoB manufacturing firms", *Industrial Marketing Management*, Vol. 89, pp. 245-264.
- Piotroski, J.D., Wong, T.J. and Zhang, T.Y. (2015), "Political incentives to suppress negative information: evidence from Chinese listed firms", *Journal of Accounting Research*, Vol. 53 No. 2, pp. 405-459.
- Preacher, K.J., Zyphur, M.J. and Zhang, Z. (2010), "A general multilevel SEM framework for assessing multilevel mediation", *Psychological Methods*, Vol. 15 No. 3, p. 209.
- Prusak, R. (2016), "The impact of employee competencies management as part of the human capital on the intellectual capital implementing process", *Management*, Vol. 20 No. 1, p. 27.
- Pucihar, A. (2020), "The digital transformation journey: content analysis of electronic markets articles and bled eConference proceedings from 2012 to 2019", *Electronic Markets*, Vol. 30 No. 1, pp. 29-37.

-
- Quinton, S., Canhoto, A., Molinillo, S., Pera, R. and Budhathoki, T. (2018), "Conceptualising a digital orientation: antecedents of supporting SME performance in the digital economy", *Journal of Strategic Marketing*, Vol. 26 No. 5, pp. 427-439.
- Remane, G., Hanelt, A., Nickerson, R.C. and Kolbe, L.M. (2017), "Discovering digital business models in traditional industries", *Journal of Business Strategy*, Vol. 38 No. 2, pp. 41-51.
- Schultz, T.W. (1961), "Investment in human capital", *The American Economic Review*, Vol. 51 No. 1, pp. 1-17.
- Schwarz Müller, T., Brosi, P., Duman, D. and Welpel, I.M. (2018), "How does the digital transformation affect organizations? Key themes of change in work design and leadership", *Management Revue*, Vol. 29 No. 2, pp. 114-138.
- Shirokova, G., Berezinets, I. and Shatalov, A. (2014), "Organisational change and firm growth in emerging economies", *Journal of East European Management Studies*, Vol. 19 No. 2, pp. 185-212.
- Suluk, J. and Kammerlander, N. (2021), "Digital transformation in family-owned mittelstand firms: a dynamic capabilities perspective", *European Journal of Information Systems*, Vol. 30 No. 6, pp. 1-36.
- Stief, S.E., Eidhoff, A.T. and Voeth, M. (2016), "Transform to succeed: an empirical analysis of digital transformation in firms", *International Journal of Economics and Management Engineering*, Vol. 10 No. 6, pp. 1833-1842.
- Sun, Q., Tong, W.H. and Tong, J. (2002), "How does government ownership affect firm performance? Evidence from China's privatization experience", *Journal of Business Finance and Accounting*, Vol. 29 Nos 1/2, pp. 1-27.
- Suneson, G. (2020), "Industries hit hardest by coronavirus in the US include retail, transportation, and travel", USA Today, available at: www.usatoday.com/story/money/2020/03/20/us-industries-being-devastated-by-the-coronavirus-travel-hotels-food/111431804/ (accessed 8 May 2020).
- Tasheva, S. and Nielsen, B.B. (2020), "The role of global dynamic managerial capability in the pursuit of international strategy and superior performance", *Journal of International Business Studies*, Vol. 53, pp. 689-708.
- Tekic, Z. and Koroteev, D. (2019), "From disruptively digital to proudly analog: a holistic typology of digital transformation strategies", *Business Horizons*, Vol. 62 No. 6, pp. 683-693.
- Verhoef, P.C., Broekhuizen, T., Bart, Y., Bhattacharya, A., Dong, J.Q., Fabian, N. and Haenlein, M. (2021), "Digital transformation: a multidisciplinary reflection and research agenda", *Journal of Business Research*, Vol. 122, pp. 889-901.
- Warner, K.S. and Wäger, M. (2019), "Building dynamic capabilities for digital transformation: an ongoing process of strategic renewal", *Long Range Planning*, Vol. 52 No. 3, pp. 326-349.
- Wooldridge, J.M. (2015), *Introductory Econometrics: A Modern Approach*, Cengage Learning, Stamford.
- Wrede, M., Velamuri, V.K. and Dauth, T. (2020), "Top managers in the digital age: exploring the role and practices of top managers in firms' digital transformation", *Managerial and Decision Economics*, Vol. 41 No. 8, pp. 1549-1567.
- Zeike, S., Choi, K.E., Lindert, L. and Pfaff, H. (2019), "Managers' well-being in the digital era: is it associated with perceived choice overload and pressure from digitalization? An exploratory study", *International Journal of Environmental Research and Public Health*, Vol. 16 No. 10, p. 1746.
- Zhang, C. and Fu, P. (2020), "Overseas-returned executives and their roles in firm performance: evidence from China", *Asia-Pacific Journal of Accounting and Economics*, pp. 1-10.
- Zhao, C., Zhang, R.J. and Chen, Y.B. (2010), "Research on the relationship between board structure and firm growth: a case study of listed companies in competitive industries", *Economic Problems*, Vol. 2010 No. 6, pp. 59-62, (Chinese Journal).

-
- Zhou, K.Z., Gao, G.Y. and Zhao, H. (2017), "State ownership and firm innovation in China: an integrated view of institutional and efficiency logics", *Administrative Science Quarterly*, Vol. 62 No. 2, pp. 375-404.
- Zhou, L., Zhang, L.H. and Wang, H. (2015), "The relationship between chairman's overseas education and role and the mediating role of listing cycle", *Economic Longitude and Latitude*, Vol. 32 No. 6, pp. 149-154.
- Zikic, J., Bonache, J. and Cerdin, J.L. (2010), "Crossing national boundaries: a typology of qualified immigrants' career orientations", *Journal of Organizational Behavior*, Vol. 31 No. 5, pp. 667-686.
- Ziółkowska, M.J. (2021), "Digital transformation and marketing activities in small and medium-sized enterprises", *Sustainability*, Vol. 13 No. 5, p. 2512.

About the authors

Dongmei Hu is a Full Professor at Xihua University, China. Her research interests are organizational behaviors, human resources management and applied psychology.

Yang Peng is a Postgraduate Student in Business Administration at Xihua University, China. Her research interest is human resources management.

Tony Fang is a Full Professor and the Stephen Jarislowsky Chair in Cultural and Economic Transformation at Memorial University of Newfoundland and an Adjunct Professor with the University of Toronto. His areas of research interest encompass issues of compensation and benefits, high performance workplace practices, pension, retirement policy and the ageing workforce, education, immigration and minimum wages, union impact on wages, innovation and firm growth, pay equity and employment equity. Bruneau Centre for Innovation and Research (IIC), 2010B. Phone: (709) 864-3779. Tony Fang is the corresponding author and can be contacted at: tfang@mun.ca

Charles Weizheng Chen is a Chair Professor at Xihua University and a Professor at Sichuan University, China. His research interests are human resources management, organizational behaviors, enterprise trade unions and industrial relations.