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Temporary employment: Curse or blessing for a firm's absorptive capacity?

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ABSTRACT

Despite the importance of absorptive capacity (AC) for firms' competitiveness, its antecedents are not yet fully understood. AC is a multidimensional construct, consisting of a firm's capability to acquire and assimilate new external knowledge (potential AC), followed by its capability to transform and exploit it (realized AC). Building on the insight that different AC dimensions vary in their nature and needs we predict that working with temporary employees will have an opposite effect on potential and realized AC. We test this proposition using firm-level data from the World Bank's Enterprise and Innovation Capability Survey for 2,228 firms in nine developing countries. We indeed find knowledge acquisition to benefit and knowledge exploitation to suffer from a firm's reliance on temporary employees. Our results thus identify a partial contradiction between the drivers of potential and realized AC. We find that a firm's integration mechanisms may potentially solve this contradiction. As all dimensions of AC are required for absorbing external knowledge, this research highlights an overlooked challenge.

1. Introduction

Absorptive capacity (AC) is a multi-dimensional construct, consisting both of potential and realized AC. Potential AC refers to acquiring and assimilating new external knowledge. Realized AC refers to a firm's capability to transform and exploit this knowledge (Zahra and George, 2002). The dimensions of AC have been previously established to vary in their nature and needs (Ebers and Maurer, 2014; Jansen et al., 2005; Zahra and George, 2002). We propose that these differences are more substantial than accounted for to date. More specifically, we propose that one organizational practice can have contrary effects on potential and realized AC. This would pose a considerable challenge for firms as all four dimensions of AC are complementary and by themselves insufficient for being able to fully take advantage of external knowledge (Zahra and George, 2002).

We specifically focus on the relationship between temporary employment and AC. We do so because firms across the world increasingly rely on temporary employees (Aleksynska and Berg, 2016; International Labour Organization, 2015; OECD, 2019). They value the knowledge (Wachsen and Blind, 2016) and flexibility temporary employment provides them with (de Stefano et al., 2019). In contrast to permanent employees, a firm's relationship with temporary employees does not include an explicit agreement for long-term employment. In response to changing markets, fluctuating demands and evolving technologies, firms can hire temporary employees for a limited period without risking infringement of legal (von Hippel et al., 2006) or psychological contracts (Rousseau, 2004). At the same time, temporary employment allows firms to save costs (Galup et al., 1997; von Hippel et al., 1997) and tap into the broad knowledge base of temporary employees (Barney, 1999; Wachsen and Blind, 2016). Consequently, temporary employment has continuously grown in popularity.

The characteristics of temporary employment provide for an interesting field of tension. Although Kleinknecht et al., and Zhou (2014) found that a firm's innovative activities benefited less from the flexibility of having temporary workers, we claim that a more nuanced view is needed. Potential AC benefits from broad connections to external agents, diverse knowledge (Ferreras-Méndez et al., 2016) and external relational embeddedness (Ebers and Maurer, 2014). Temporary employees allow firms to tap into external knowledge (Arvanitis, 2005) and to access various networks (Kleinknecht et al., 2014). As such, we expect that potential AC benefits from temporary employees. On the contrary, realized AC requires deep connections (Ferreras-Méndez et al., 2016) and close and intact ties between employees (Fosfuri and Tribó, 2008). Temporary employment, however, is found to weaken organizational communication and the ties between employees (Wheeler and Buckley, 2001). Furthermore, given their limited organizational tenure, temporary employees do not have the depth of knowledge (Matusik and Hill, 1998), nor do they always know how to share information (George and

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Chattopadhyah, 2015) that is required for realized AC, such as insights into the type and location of internally available knowledge (Lane et al., 2006). Consequently, we expect a negative effect of temporary employees on realized AC.

We test the above-outlined relationships in a quantitative study with 2,228 firms in the manufacturing industry across nine developing countries in Eastern Africa, Western Africa, Southern Asia, and Eastern Asia. In developing countries, temporary or casual employees can be found in elementary occupations, such as factory workers, packaging, or store helpers, or more technically skilled, often imported, workers such as welders, mechanics, or plant operators (Bhorat and van der Westhuizen, 2013; Fine et al., 2012; Okafor, 2012a, 2012b; ILO, 2015). Temporary workers can either work directly for a company or they can be hired through an intermediary or labour broker (George and Chattopadhyah, 2015; Klerck, 2009). Firms in developing countries often work with non-standard work arrangements to achieve a more flexible workforce in the case of demand shortage, or seek labour cost advantages by paying lower wages to temporary workers or by excluding such workers from social security or corporate benefits (Aleksynska and Berg, 2016).

Partially in line with our expectations, we find that hiring temporary employees significantly benefits knowledge acquisition (potential AC), but not assimilation, and harms knowledge exploitation (realized AC), but not transformation. As such, the results of our study have important implications for the strategy literature. In addition, we find that integration mechanisms may serve as an important moderator that amplify the positive effects between temporary employees and potential AC, but attenuate the negative effect of temporary employees and realized AC. As such, the results of our study have important implications for the strategy literature.

First, we add to the 'limited explanations of the actual mechanisms through which absorptive capacity emerges as an organizational learning capability' (Martinkenaite and Breunig, 2016; Naqshbandi and Tabche, 2018). Until now, research has primarily focused on the tangible outcomes of absorptive capacity (Lane et al., 2006; Volberda et al., 2010). To the best of our knowledge, this study is the first to test whether one organizational practice simultaneously benefits and harms different AC dimensions. As such, it suggests that the mechanisms of the AC dimensions are partially counteracting. Given their complementarity, this poses a substantial challenge for firms, which has to date been overlooked. This research thus adds an interesting perspective to AC research and prompts future studies to test whether there are additional organizational practices with a comparable effect on the one hand and to find solutions for overcoming the counteracting mechanisms underlying the four AC dimensions on the other hand.

Second, we expand research on AC from the thus far set boundaries of developed countries to nine developing countries in Africa and Asia. Earlier work in developing countries shows that temporary work has predominantly negative, and at best neutral, effects on firm innovation processes (e.g. Kleinknecht et al., 2014). We propose that in a developing country context, characterized by higher levels of environmental dynamism but also higher scarcity of human capital, temporary employment is likely to have positive effects on the firm-level resource acquisition and assimilation but negative effects on resource transformation and exploitation. Developing countries are much more unstable and dynamic than developed countries (Barnard et al., 2017), which prompts firms to build pronounced levels of AC (Peng et al., 2007). At the same time, the availability of human capital in developing countries is highly restricted (van Uden et al., 2017). Prior related knowledge, however, is essential for a firms' capability to absorb new external knowledge (Cohen and Levinthal, 1990) and the lack thereof confronts firms with unique challenges. As such, one should not assume that previous findings from developed countries are equally applicable to this particular context. Conducting AC research in developing countries 'can help identify some of the implicit assumptions upon which current theories of the organization and their decision-making are built, and thus extend those theories by modifying their predictions to address business under extreme conditions' (Barnard et al., 2017, p. 490).

The remainder of this article is structured as follows: We first provide an overview of the theories on absorptive capacity and temporary employment and subsequently build our hypotheses. Next, we specify the empirical data and research methodology, followed by an outline of the analysis and a summary of the results. After discussing our findings and avenues for future research, we provide closing thoughts.

2. Theory and hypotheses

2.1. Temporary employment

Across the globe, the percentage of temporary workers among the overall workforce has increased significantly over the years: In European countries, the number of temporary employees has almost doubled since the 1990s (International Labour Organization, 2015), accounting for 14 % of the overall workforce in 2018 (OECD, 2019). In developing countries, the average share of temporary employees is higher (Aleksynska and Berg, 2016), but also shows much more variation than is found in developed countries (International Labour Organization, 2015). This pattern is clearly reflected among the firms participating in our study. On average, 43% of the firms indicate that they engage with temporary employees to some extent. In Indonesia, however, this percentage is only 15% whereas is reaches up to 60% in Uganda, Ethiopia and Vietnam and even 80% in Kenya.

Temporary employment is defined as an employment relationship, in which both the employer and the employee contractually agree that the contract will end on a specific date or upon fulfilment of detailed conditions (Bernhard-Oettel et al., 2017). Temporary employment includes fixed-term, project or task-based contracts, and seasonal or casual work. Most countries regulate it by specific legal provisions concerning the maximum contract duration, the eligible number of contract renewals, and valid reasons for recourse (International Labour Organization, 2015). In the context of developing countries, temporary employees are predominantly casual workers, which are employed with one firm for a matter of days, weeks or months (Aleksynska and Berg, 2016).

The motivation for individuals to work as temporary employees falls into two broad categories. First, some temporary employees value the variety and flexibility of engaging in temporary employment. By frequently alternating between employers, they can use their skills in diverse organizational settings and as a consequence, increase their knowledge levels in industry and occupational best practices (von Hippel et al., 2006). Second, temporary employees may engage in this form of employment because they have only limited opportunities to do otherwise (Connelly and Gallagher, 2004). If entered involuntarily, temporary employment can put a significant burden on employees, as it shifts the risks from the employer to the employee (Guest, 2004).

The motivation for firms to engage in temporary employment is multi-faceted. First, it provides them with flexibility in responding to changing demands, technologies, and markets (Aleksynska and Berg, 2016; de Stefano et al., 2019; Michie and Sheehan, 2003). Second, it allows firms to avoid labour law restrictions and to reduce the costs associated with employees' wages and benefits (von Hippel et al., 2006). Third, temporary employees provide firms with access to a variety of external information (Barney, 1999; Wachsen and Blind, 2016) and highly specialized knowledge (Connelly and Gallagher, 2004). Having access to external knowledge is suggested to help firms with easing the constraints of internal resource (Gupta et al., 2006). Temporary employment is consequently considered a valuable means to increase firms' competitive advantage by providing knowledge beyond existing internal capabilities (Kodama, 1995; Matusik and Hill, 1998).

2.2. Absorptive capacity

More than 25 years ago, Cohen and Levinthal (Cohen and Levinthal,

1989, 1990, 1994) coined the term absorptive capacity. By putting RandD at the centre of firms' innovative processes and by linking it to both learning and innovation, they positioned AC as an ever-relevant concept. Since then, it has 'become almost axiomatic that knowledge lies at the core of the creation and maintenance of competitive advantage' (Volberda et al., 2010, p. 932).

A substantial number of both conceptual and empirical work has evolved around the AC concept and has contributed to the understanding of how firms best acquire and use new external knowledge for competitive advantage (Carlo et al., 2012; Flor et al., 2018; Lane et al., 2006; Lewin et al., 2011; Pereira and Leitão, 2016; Song et al., 2018; Stock et al., 2001; Szulanski, 1996; Tsai, 2001; Van den Bosch et al., 1999; Volberda et al., 2010). Lane and Lubatkin (1998) are among the first researchers to stress the multi-dimensionality of the AC construct. Almost ten years later, Lane and colleagues (2006) built on their initial insights and conducted an extensive literature review, prompting them to claim that the AC concept suffers from reification. They developed an exploration/exploitation learning framework of AC, consisting of three sequential processes: the recognition and understanding of external knowledge, its assimilation through transformative learning and its use to create new knowledge and commercial output through exploitative learning (Lane et al., 2006). In our research, we draw on the influential model on AC of Zahra and George (2002) to develop our hypotheses. Especially relevant for Zahra and George's model of AC are scholarly discussions within the knowledge-based view of the firm (Kogut and Zander, 1992) and dynamic capabilities (Teece et al., 1997). Since its introduction, the model of AC proposed by Zahra and George (2002) has been frequently used as a theoretical framework for subsequent research (Ferreras-Méndez et al., 2016; Fosfuri and Tribó, 2008; Jansen et al., 2005). It has been further modified to incorporate the importance of feedback loops (Gkypali et al., 2018), socialization mechanisms, and power relationships (Todorova and Durisin, 2007).

Zahra and George's (2002) dynamic capability perspective of AC entails four dimensions (knowledge acquisition, assimilation, transformation, and exploitation), which distinctively constitute potential and realized AC. According to the authors, this division is required to understand why some firms are more efficient in creating and deploying knowledge than others: For instance, if firms primarily focus on the acquisition and assimilation of new external knowledge (potential AC), they may be able to continuously renew their knowledge stock yet fail to gain the benefits of its exploitation. On the contrary, firms solely concentrating on transforming and exploiting knowledge (realized AC) may succeed at realizing short-term profit while running the risk of falling into a competency trap (Jansen et al., 2005; Zahra and George, 2002). Along the same lines, Lewin and colleagues (2011, p. 91) claim that only if firms are capable of transferring and integrating external knowledge with 'internal AC routines are external AC routines useful'. We add an important new aspect to this perspective and propose that the underlying mechanisms of the AC subsets differ to an extent, which has not yet been accounted for in its entirety. In the following, we provide more insights into the characteristics of and differences between the AC dimensions (Ebers and Maurer, 2014; Jansen et al., 2005; Zou et al., 2018). Furthermore, we specify how temporary employees are expected to impact AC and develop our hypotheses.

2.3. Temporary employment and potential absorptive capacity

The first two dimensions of AC, knowledge acquisition and assimilation, jointly form the subset potential AC (Zahra and George, 2002). Knowledge acquisition refers to a firm's capability of identifying and acquiring externally created knowledge (Zahra et al., 2002). It enables firms to expand the breadth and depth of available knowledge by quickly spotting and obtaining it (Xie et al., 2018). According to theory on strategic networks (Gulati et al., 2000), the breadth and variety of information available to a firm can be increased by linkages to many external sources (Murovec and Prodan, 2009). Different external knowledge sources such as acquisitions, licensing agreements, and RandD collaborations can, therefore, foster potential AC (Fosfuri and Tribó, 2008; Pereira and Leitão, 2016; Vlacic et al., 2019). Similarly, temporary employees provide firms with access to external knowledge (Arvanitis, 2005), new ideas (Wachsen and Blind, 2016) and different networks (Kleinknecht et al., 2014). They are thus 'an important vehicle for importing valuable performance-enhancing knowledge into the firm' (Matusik and Hill, 1998, p. 681). Moreover, based on their short firm membership and the therewith associated frequent labour turnover, new knowledge and ideas are introduced to the firm continuously (Wachsen and Blind, 2016). Based on the nature of temporary employment in developing countries, rotation of temporary employees can be expected to be particularly frequent (Aleksynska and Berg, 2016). Moreover, a significant part of such temporary workers in developing countries are high-skilled workers, such as mechanics or electricians, that are 'imported' from other countries. Fine et al. (2012), for example, showed that welders, fitters and scaffolders were indeed imported into Nigeria from the Philippines and the UK. We expect such temporary employees to benefit a firm's capability to identify and acquire external knowledge (knowledge acquisition) and we hypothesize the following.

Hypothesis 1: *Temporary employment has a positive effect on knowledge acquisition (Potential AC)*

Knowledge assimilation entails analysing, processing, interpreting, and understanding the knowledge, which was obtained from external sources (Zahra and George, 2002). Knowledge assimilation aims to 'understand external knowledge' (Jiménez-Barrionuevo et al., 2011, p. 192). For a more detailed description of the expected relationship between temporary employees and knowledge assimilation, the following two dimensions of knowledge are especially relevant. First, public knowledge refers to industry and occupational best practices which are not unique to any one firm but reside in the public domain (Matusik and Hill, 1998, p. 683). The experiences, temporary employees make in various organizational settings, contribute greatly to their public knowledge (von Hippel et al., 2006). Second, individually held knowledge refers to the total of an employee's competences, information, and knowledge (Zander and Kogut, 1995), which can be applied autonomously. It is dependent on the cognitive abilities and skills of an individual (Lam, 2000). Similar to public knowledge, the variety of individual experiences enhances individual knowledge (Nonaka, 1994). Given their engagement with different organizations, temporary employees frequently surpass permanent employees in the two types of knowledge mentioned above (von Hippel et al., 1997). Furthermore, temporary employees often excel with expert knowledge in a specific field (Matusik and Hill, 1998). Even though human capital is limited in developed countries (van Uden et al., 2017), we expect that the breadth of experience supporting both public and individual knowledge of temporary employees can help organizations with understanding external information, particularly benefiting knowledge assimilation. Moreover, with the frequent import of technically skilled temporary workers (Fine et al. (2012), we hypothesize the following:

Hypothesis 2: *Temporary employment has a positive effect on knowledge assimilation (Potential AC)*

2.4. Temporary employment and realized absorptive capacity

Realized AC entails a firm's capability to leverage the previously acquired and assimilated knowledge by both transforming and exploiting it. Knowledge transformation refers to combining existing with newly acquired and assimilated knowledge (Zahra and George, 2002). As such, 'the level of prior related knowledge', (Cohen and Levinthal, 1990, p. 128) is central to knowledge transformation. More specifically, employees need to be aware 'of what knowledge the organization already possesses, as well as where and how it is used' (Lane et al., 2006, p. 838). These firm-specific insights are particularly valuable as the point of entry for knowledge into a firm is frequently not where it can be best exploited (Cohen and Levinthal, 1990; Lane et al., 2006). As

previously elaborated on, temporary employees often excel at public knowledge; they do, however, inevitably lack the private knowledge of a firm (Galup et al., 1997). Private knowledge is unique to a firm and includes e.g., its routines and processes. Equally important is the level of temporary employees' collective knowledge. Collective knowledge, in contrast to the previously elaborated on individual knowledge, is frequently referred to as the collective mind of a firm. It exists between employees rather than within a single individual and emerges from interaction (Lam, 2000). Their short organizational tenure, however, does not allow temporary employees to build high levels of private and collective knowledge (Matusik and Hill, 1998). This challenge is particularly applicable to the context of developing countries with an especially short tenure of temporary employees (Aleksynska and Berg, 2016) and a lack of human capital (van Uden et al., 2017). We propose that temporary employees lack the firm-specific knowledge (Lane et al., 2006; Matusik and Hill, 1998) and skills (George and Chattopadhyay 2005) required to successfully transform knowledge, and we hypothesize:

Hypothesis 3: *Temporary employment has a negative effect on knowledge transformation (Realized AC).*

Knowledge exploitation refers to the integration of acquired, assimilated, and transformed knowledge into a firm's operations. It allows a firm to refine, extend, and leverage existing competencies as well as to create new competencies (Zahra and George, 2002). As such, it enables firms to ultimately translate knowledge into profit (Kafouros et al., 2020; Xie et al., 2018). For the full integration of knowledge in existing operations and thus the exploitation of knowledge, there is an especially pronounced need for strong ties, mutual understanding, and successful communication between employees (Jansen et al., 2005). Contradicting this need, engaging temporary employees bears the risk of weakening the ties between employees (Wheeler and Buckley, 2001). Furthermore, the detailed sharing of knowledge is usually 'reserved only for implicitly trusted partners [… and it requires the] tacit information that is only accurately communicated after obtaining a comprehensive understanding of a partner's business and social worlds' (Galup et al., 1997, p. 706). As such, trust is an essential prerequisite for firm members to share information (Nonaka, 1994). In line with the social network theory (Granovetter, 1973), employees have more trust in a person, that they have a long-lasting relationship with (Granovetter, 1985). Furthermore, prejudice and conflict between temporary and permanent employees (von Hippel et al., 2006) can negatively impact their communication and willingness to share information. As such, temporary employees are expected to undermine the requirements of knowledge exploitation. Therefore, we hypothesize the following:

Hypothesis 4: *Temporary employment has a negative effect on knowledge exploitation (Realized AC).*

3. The moderation effect of integration mechanisms

As indicated above, both potential and realized AC are required for the successful exploitation of knowledge (Zahra and George, 2002). However, despite an expected positive effect on potential AC, we propose temporary employment to have a negative effect on realized AC, because it undermines vital requirements of knowledge transformation and exploitation (realized AC), namely the need for close ties, successful communication and shared knowledge (Ferreras-Méndez et al., 2016; Fosfuri and Tribó, 2008; Zahra and George, 2002).

Integration mechanisms have previously been found to increase the information flow, interaction and thus connectedness between employees (Sheremata, 2000). They are an important element of Zahra and George's (2002) model of AC as they are proposed to "facilitate the sharing and eventual exploitation of knowledge" (2002, p. 194) and thus to reduce the gap between potential and realized AC. Empirically supporting the latter insight, Easterby-Smith et al., and Ferdinand (2008) find that integration mechanisms support the conversion of potential into realized absorptive capacity. More specifically, such integration mechanisms are widely found to increase connectedness and shared meanings among employees (von Briel et al., 2019).

In particular, we expect that integration mechanisms aimed at the coordination of knowledge help firms to address the difficulties brought about by temporary employees for knowledge transformation. Such coordination of knowledge refers to lateral ways of coordination, both explicitly designed or emerging from interaction processes. In this research, we specifically focus on liaison devices and knowledge management systems. Liaison devices, such as knowledge coordinators, are a way for firms to encourage mutual adjustment and connections across units (Mintzberg, 1980). With that, they allow to cut across divisions and deepen knowledge flows (Jansen et al., 2005). Temporary employees generally lack firm-specific knowledge (Matusik and Hill, 1998), which makes the ability of liaison devices to actively foster the exchange of knowledge (Daft and Lengel, 1986; Roberts et al., 2012) especially critical. We build on prior empirical insights of Jansen and colleagues (2005), who find cross-functional interfaces such as liaison devices to have a significant positive effect on knowledge transformation.

Knowledge management impacts the degree to which knowledge within the firm is shared between its members. Knowledge management systems are one mechanism that can support a firm with communicating and transferring individual knowledge within the firm (Lane et al., 2006). In addition, knowledge management systems represent a long-term storage of firms building routines, organizational memory and organizational learning (Lindner and Wald, 2011). These systems act as facilitators for identifying experts in the firm and communicating critical knowledge to temporary employees (Mahnke et al., 2005). This may aid temporary workers in understanding not only a firm's codified knowledge, but also the context and processes behind such knowledge (Kasvi et al., 2003). As such, we expect that liaison and knowledge management systems will amplify the positive effect of temporary employment on potential AC and attenuate the proposed negative effect temporary employees have on realized AC.

Hypothesis 5: *Integration mechanisms (knowledge coordinators and knowledge management systems) amplify the positive effect of temporary employment on potential AC.*

Hypothesis 6: *Integration mechanisms (knowledge coordinators and knowledge management systems) attenuate the negative effect of temporary employment on realized AC.*

In Fig. 1, we summarize the above-outlined relationships to illustrate our hypotheses.

4. Data

To test our hypotheses, we used a combined data set consisting of the World Bank Enterprise Survey (ES) and the Innovation Capabilities Survey (IC). The ES is a firm-level survey capturing an economy's private sector. It was first introduced by the World Bank in 2005 and has featured in many studies since (Birhanu et al., 2016; van Uden et al., 2018; Zanello et al., 2016). A recent systematic literature review on innovation in developing countries refers to the World Bank's

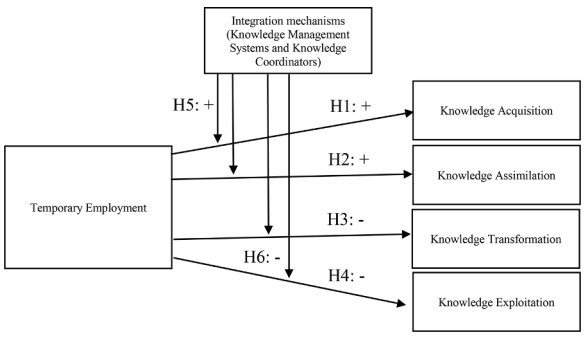

Fig. 1. Conceptual model.

innovation data as "popular data sets for cross-country firm level analyses" (Zanello et al., 2016).

The Enterprise Survey is conducted by private contractors on behalf of the World Bank and covers the manufacturing, retail, and services industry. It is stratified based on geographic location, industry sector, and firm size. The ES questionnaire is answered by top managers or business owners, with the support of company accountants and human resource managers if required for specific questions.[1] We used the ES to gain insights into firm characteristics (control variables, except for knowledge coordinator) and firms' use of temporary employment (independent variable). The World bank introduced the IC in 2014. It is a follow-up study to the Enterprise Survey. IC respondents are a randomly selected subset (75 percent) of the firms, which have been previously interviewed in the standard ES. It is aimed at gathering in-depth insights on innovation activities and outcomes. For this study, the datasets of the ES and IC surveys are merged through the available unique firm identifier.

Given their high suitability as a research context, our study is conducted in developing countries in Eastern Africa, Western Africa, Eastern Asia, and Southern Asia: The combined data set of ES and IC is available for the following nine countries: Bangladesh, Ethiopia, Ghana, India, Indonesia, Kenya, Tanzania, Uganda, and Vietnam. Table 1 provides an overview of the participating countries and survey years.

5. Outcome Variable: Absorptive Capacity

We measure AC as a multi-dimensional construct, consisting of four different yet complementary processes, namely acquisition, assimilation, transformation, and exploitation of knowledge. Our measurement is based on Zahra and George's (2002) theoretical conceptualization and previous empirical studies with multi-dimensional measures of AC (Fosfuri and Tribó, 2008; Jansen et al., 2005; Jiménez-Barrionuevo et al., 2011; Roberts, 2015). Given that not all approaches to measuring AC are applicable in our research context, many items used are only applicable to large multi-site corporations for example (Benhayoun et al., 2020), we combined measurement items from several earlier studies. Below, we indicate which measures were derived from which earlier studies.

Given the importance of the AC construct for our research and the diversity in its measurement to date, we assessed the reliability and validity of our construct in depth. First, we assess Cronbach's alpha values of the four dimensions of AC, namely knowledge acquisition, assimilation, transformation, and exploitation (α=0.89, α=0.82, α=0.64, α=0.85). Generally, our model has a good level of reliability. As Cronbach's alpha can both under- and overestimate the reliability of constructs, contingent on the amount of residual covariance among the indicators (Raykov, 2001), we additionally calculated composite reliability (CR) and average variance extracted (AVE) of AC. The combined CR value accounts for 0.937 and is thus above the desired threshold of 0.7 as proposed by Hair and colleagues (1998). To better understand how the different items loaded on their corresponding latent constructs, we furthermore calculated the average variance extracted (AVE). The AVE values for knowledge acquisition, assimilation, and exploitation exceeded the widely accepted threshold of 0.50, the AVE value of knowledge transformation is only slightly short thereof (0.484) (Hair et al., 1998). These results signal convergent validity of our AC scale and the above-outlined insights suggest construct reliability.

To further assess the validity of our AC construct, we conducted a confirmatory factor analysis (CFA) of the items pertaining to knowledge acquisition, assimilation, transformation, and exploitation. The results indicate that the model fits the data well ($\chi2$=189.76, p=.00; $\chi2$/ df=29, comparative fit index [CIF]=0.986, root mean square error of approximation [RMSEA]=0.047). These insights suggest a suitable construction of AC in this research. Table 2 provides a more detailed overview of the reliability and validity of our AC construct.

Table 1
Overview of years of survey and variable origin.

	ES	IC	#firms in sample
Bangladesh	2013	2015	203
Ethiopia	2015	2016	300
Ghana	2013	2015	201
India	2014	2016	1000
Indonesia	2015	2016	300
Kenya	2013	2014	219
Tanzania	2013	2015	179
Uganda	2013	2014	184
Vietnam	2015	2016	300
Variables	Temporary Employment Country Industry Firm Size Firm Type Firm Age Foreign Ownership Export Education Education Obstacle Training	AC: Acquisition (Potential) Assimilation (Potential) Transformation (Realized) Exploitation (Realized) Knowledge Coordinator Knowledge Management System	

Table 2
Construct measurement and confirmatory factor analysis (CFA).

Absorptive Capacity	Factor loadings	CR	AVE
Knowledge Acquisition (Cronbach's α = 0.890)		0.890	0.811
(1) This establishment has extensive contact with researchers and universities	0.964***		
(2) This establishment has an active network of contacts with scientific and research community	0.832***		
Knowledge Assimilation (Cronbach's α = 0.816)		0.798	0.571
(3) This establishment is successful at acquiring the knowledge required to understand customer needs	0.730***		
(4) This establishment is successful at acquiring the knowledge required to identify market opportunities	0.819***		
(5) This establishment is successful at acquiring the knowledge required to comply with the expectations of trading partners	0.714***		
Knowledge Transformation (Cronbach's α = 0.640)		0.655	0.484
(6) This establishment's employees have the skills to fuse or link newly acquired knowledge with existing knowledge	0.723***		
(7) In this establishment, different departments can work together easily.	0.668***		
Knowledge Exploitation (Cronbach's α = 0.851)		0.797	0.661
(8) This establishment can easily commercialize products and services that are completely new to the establishment.	0.753***		
(9) This establishment can easily increase the sales of new products in existing markets.	0.864***		
(10) This establishment can easily increase the sales of new products in new markets.	0.819***		
Model fit index: $\chi2$=28.61; p=.00; $\chi2$/ df=11; CFI=0.986; RMSEA=0.047			
Composite Reliability of overall AC construct: CR = 0.937			

*** p < 0.001

[1] For detailed information on the survey, sampling and methodology we refer to the information provided by the World Bank: https://www.enterprisesurveys.org/en/methodology

Knowledge Acquisition (Potential AC). Knowledge acquisition refers to how well firms can identify and acquire external knowledge (Zahra and George, 2002). As universities and research communities are a primary source for learning (Song et al., 2018), participants in the survey were asked to what degree they could 'identify and select knowledge' through 'extensive contact with researchers and universities' and an 'active network of contacts with the scientific and research community' (Table 2, question 1 and 2). This measure is aligned with previous research (Fosfuri and Tribó, 2008).

Knowledge Assimilation (Potential AC). Knowledge assimilation references the capability to process and understand external knowledge (Zahra and George, 2002). In line with Jansen et al. (2005), knowledge assimilation was measured by asking our respondents whether firms have the knowledge required to 'understand customer needs', 'identify market opportunities' and 'comply with the expectations of trading partners' (Table 2, question 3, 4 and 5).

Knowledge Transformation (Realized AC). To measure a firm's capability to combine existing with newly acquired and assimilated knowledge, the survey included questions about whether 'employees have the skills to fuse or link newly acquired knowledge with existing knowledge'. It furthermore included information on to what degree 'different departments can work together easily' (Table 2, questions 6 and 7). This operationalization corresponds to a study by Roberts (2015).

Knowledge Exploitation (Realized AC). Knowledge exploitation entails a firm's capability to integrate knowledge into its operations for profit generation. Following previous research (Ferreras-Méndez et al., 2016; Jansen et al., 2005), this fourth dimension of is captured AC by questions assessing whether firms 'can easily commercialize products and services that are completely new to the establishment' (Table 2, question 8), and whether they can 'increase the sales of new products in existing' (Table 2, question 9) and 'new markets' (Table 2, question 10).

6. Independent Variables

Temporary employment. Temporary employment was measured by calculating the percentage of temporary employees among the overall workforce. This measurement allows for comparability across firms and it is in line with previous research (Martínez-Sánchez et al., 2009). Two ES questions build the basis for this measurement, namely 'how many temporary full-time employees did this establishment employ' and 'how many full-time employees did this establishment employ'. The World Bank defines temporary workers in the ES as any type of temporary workers who are employed with a firm for less than one year without the promise of contract renewal (Aleksynska and Berg, 2016). Our measure of temporary employment was obtained by dividing the number of temporary employees by the total number of employees. As this resulted in a very skewed measure we log-transformed it before use in our regression analyses.

Knowledge Management System. Knowledge management impacts the degree to which knowledge within the firm is shared between its members. Knowledge management systems are one mechanism that can support a firm with communicating and transferring individual knowledge within the firm (Lane et al., 2006). We, therefore, account for the degree to which a firm 'improves its knowledge management systems to better use or exchange information, knowledge and skills within the establishment'. This information was captured on a 6-point Likert Scale ranging from complete disagreement to complete sagreement.

Knowledge Coordinator. Knowledge coordinators encourage mutual adjustment and connections across units (Mintzberg, 1980). As such, they allow to deepen knowledge flows across divisions (Jansen et al., 2005) and they foster the exchange of knowledge (Daft and Lengel, 1986; Roberts et al., 2012). We measure the presence of a knowledge coordinator in the IC by capturing whether a firm 'has a department or coordinator that diffuses and disseminates knowledge within the establishment'. This information was captured on a 6-point Likert Scale ranging from complete disagreement to complete agreement.

7. Control Variables

Country. Taking on a dynamic capability view of AC (Zahra and George, 2002), it is vital to account for the degree of dynamism and the rate of change in a firm's external environment (Fainshmidt et al., 2016). We, therefore, control for the country a firm operates in with dummy variables.

Industry. The firms participating in our study are all operating in the manufacturing industry. Nevertheless, we expect variance in knowledge processing strategies and, consequently, apply the Pavitt Taxonomy. The Pavitt Taxonomy differentiates between four groups of manufacturing firms (coded as dummy variables): supplier dominated, scale intensive, science-based and specialized equipment suppliers (Bogliacino and Pianta, 2016; Pavitt, 1991).

Firm size. The expected impact of firm size on AC is a double-edged sword. On the one side, increasing firm size benefits knowledge absorption through a more extensive stock of diverse accumulated knowledge (van Wijk et al., 2008). Furthermore, larger firms usually have more sophisticated processes for knowledge sharing (Lane et al., 2006) and more resources that are explicitly devoted to the creation and transfer of knowledge (Gupta and Govindarajan, 2000). On the other side, with increasing bureaucracy, large firms lose their flexibility in acquiring and assimilating external knowledge (Jansen et al., 2005). In developing countries, firms are predominantly SMEs (Zanello et al., 2016), which are well integrated with their environment and can, therefore, access local information freely and flexibly (van Wijk et al., 2008). To account for the importance of firm size for AC (Fosfuri and Tribó, 2008; Jansen et al., 2005) we control for the size of a firm with the overall number of employees (log-transformed).

Firm type. Aligned with the argument for firm size, we also control for whether an 'Establishment is part of a larger firm'. Establishments, that belong to a larger firm are coded one, stand-alone establishments are coded zero.

Firm age. Despite collective agreement on the importance of firm age as a vital determinant for AC, there is thus far no consensus on how the former is related to the latter (van Wijk et al., 2008; Zou et al., 2018). On the one side, organizational inertia affects young firms less than old firms (Hannan and Freeman, 1984). Young firms can therefore be expected to have higher levels of AC. On the other side, the path dependency and accumulative nature of AC suggest that mature firms have more experience and skills to absorb new knowledge (Cohen and Levinthal, 1990). In line with earlier studies (Jansen et al., 2005; Kotabe et al., 2017; Zou et al., 2018), we control for the age of a firm by calculating the years a firm has been in operation since its formal registration.

Export. Export provides firms with an opportunity for exchange with non-domestic partners and confronts them with higher international competitive pressure (Lane et al., 2001). We thus include a binary control variable, which takes the value of one for firms generating sales from export and which is coded zero for firms with national sales only.

Foreign Ownership. Similarly, foreign ownership can allow firms to tap into knowledge external to their local context and as such impact their AC level (Lane et al., 2001). We control for the percentage of the firm that is owned by 'Private foreign individuals, companies or organizations'. Due to its skewed nature, this measurement was log-transformed before use in our regression models.

Employee Education. The education of its employees plays an important role in building the knowledge stock available to a firm (Murovec and Prodan, 2009). It has previously been established as an important prerequisite of and driver of knowledge generation and utilization (Hausman, 2005) and is thus essential to take into account for AC research (Muscio, 2007). We capture the percentage of full-time workers, who have completed secondary school as a measurement for

education.

Education Obstacle. Given the above-discussed importance of education and the lack of human capital in developing countries (van Uden et al., 2017), we additionally assess the degree to which an 'inadequately educated workforce" represents an obstacle for firms. This information was captured on a 6-point Likert Scale ranging from education being perceived as a very large obstacle to no obstacle at all.

Training. Training is an important means for enhancing the internal flow and distribution of knowledge. It enables both the reconfiguration of existing knowledge (Thornhill, 2006) and the creation of new understandings (Kim and Sung-Choon, 2013). Hence, it is important to take into account whether firms offer training to their employees when assessing their absorptive capacity (Muscio, 2007). More specifically, training has been previously established to positively affect AC (Ebers and Maurer, 2014; Pereira and Leitão, 2016). We control for training with a dichotomous variable that captures whether or not firms have offered training to their employees (Murovec and Prodan, 2009).

8. Method

Given that our dependent variables are continuous variables that follow a normally distribution, we utilize hierarchical moderated OLS regressions to analyze our data. This approach is identical to the methods of analysis utilized by earlier studies using the same, or highly similar, measures of AC (Fosfuri and Tribó, 2008; Jansen et al., 2005; Roberts, 2015)

Firms in our sample operate in nine countries, bearing the possibility of correlated standard errors for firms located in the same (national) environment. To account for this possible dependence between observations we clustered standard errors by country (Huang, 2016). We opt to use this approach over estimating multi-level models due to the relatively small number of countries in our dataset (i.e. 9) to which multilevel estimation is rather sensitive (Maas and Hox, 2004; McNeish et al., 2016). This approach has been frequently used in similar studies that rely on the World Bank Enterprise Survey or datasets with a similar structure (e.g. van Uden et al. (2019); Hartmann (in press); see for an overview: Zanello et al. (2016)).

9. Results

Table 3 summarizes the descriptive statistics of and pairwise correlations between the variables of this study.

We test our hypotheses with a series of 8 regression models (see Table 4). Models 1, 3, 5, and 7 include all control variables and the direct effect of temporary employees (independent variable) on the four dimensions of AC. Models 2, 4, 6, and 8 assess the moderation effects of the strength of the knowledge management system and the knowledge coordinator on the effect of temporary employment on the four dimensions of AC. All 8 models are highly statistically significant and the explanatory power ranges from 15.3% (model 1) to 50.8% (model 5 and 6). To enable better comparability of the effect sizes, we follow the common practice of examining the marginal effects of the independent variables at one standard deviation above and below the mean (Hoetker, 2007).

Model 1 shows that temporary employment has a significant positive effect on the first process step of AC, namely the acquisition of knowledge. More specifically, we observe that moving from one standard deviation below to one standard deviation above the mean in the percentage of temporary employees among the workforce increases firms' ability to acquire new external knowledge by 0.18 SD. This corresponds to a rise of 10.3 percent. As such, the results provide support for the importance of temporary employees for knowledge acquisition and thus support Hypothesis 1.

The results of model 3 show that there is insufficient evidence to confirm a positive effect of temporary employment on knowledge assimilation. The coefficient has the expected positive sign but it is not

Table 3
Descriptive statistics and correlation matrix (n=2228).

	Variable	Mean	SD	Min	Max	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Acquisition	2.17	1.60	0.00	6.00	-															
2	Assimilation	4.47	0.87	0.00	6.00	-0.02	-														
3	Transformation	4.46	0.94	0.00	6.00	0.03	0.63	-													
4	Exploitation	4.17	1.00	0.00	6.00	0.06	0.53	0.52	-												
5	Temporary Employment*	1.47	1.74	0.00	4.60	0.07	0.01	0.02	-0.04	-											
6	Country	82.59	46.23	16.00	132.00	0.02	0.05	-0.07	0.07	-0.16	-										
7	Industry	1.73	0.88	1.00	4.00	0.07	0.03	0.03	0.07	-0.08	0.25	-									
8	Firm Size*	3.68	1.41	0.70	8.85	0.16	0.17	0.20	0.15	-0.15	0.12	0.03	-								
9	Firm Type	0.15	0.36	0.00	1.00	0.13	0.11	0.13	0.08	-0.02	0.02	0.00	0.31	-							
10	Firm Age	19.15	14.30	0.00	151.00	0.04	0.03	0.02	0.03	0.00	0.08	0.09	0.22	0.11	-						
11	Education	57.31	36.17	0.00	100.00	0.16	-0.05	-0.04	-0.05	0.06	0.13	0.03	0.09	-0.05	-0.06	-					
12	Education obstacle*	0.60	0.53	0.00	1.61	0.03	0.04	0.09	0.05	0.05	-0.08	-0.07	0.01	0.02	-0.06	-0.09	-				
13	Training	0.35	0.35	0.00	1.00	0.10	0.17	0.16	0.17	0.04	0.08	0.09	0.25	0.19	0.12	0.05	0.04	-			
14	Knowledge Management System	4.31	4.31	0.00	6.00	0.02	0.58	0.63	0.47	0.03	0.01	0.04	0.17	0.10	0.03	-0.02	0.05	0.14	-		
15	Knowledge Coordinator	4.00	3.99	0.00	6.00	0.16	0.49	0.54	0.45	-0.03	0.21	0.09	0.19	0.12	0.03	0.01	0.09	0.16	0.53	-	
16	Foreign Owner*	0.33	0.33	0.00	4.61	0.05	0.00	0.03	-0.02	0.08	-0.16	0.00	0.15	0.10	-0.01	0.08	0.03	0.07	0.01	-0.03	-
17	Export	0.28	0.28	0.00	1.00	0.12	0.11	0.12	0.07	0.07	0.02	-0.05	0.37	0.19	0.15	0.04	0.05	0.22	0.08	0.14	0.18

* Log-transformed.

Table 4
Regression analyses (n=2228).

	Model 1 Acquisition		Model 2 Acquisition		Model 3 Assimilation		Model 4 Assimilation		Model 5 Transformation		Model 6 Transformation		Model 7 Exploitation		Model 8 Exploitation	
	B	SE	B	SE	B	SE	B	SE	B	SE	B	SE	B	SE	B	SE
Constant	0.97**	(0.22)	1.37**	(0.25)	2.38**	(0.13)	2.46**	(0.14)	1.93**	(0.13)	2.03**	(0.15)	2.22**	(0.15)	2.20**	(0.16)
Country fixed effects	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Industry fixed effects	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Control Variables																
Firm Size	0.14**	(0.03)	0.15**	(0.03)	0.00	(0.01)	0.01	(0.01)	0.03*	(0.01)	0.03*	(0.01)	0.01	(0.02)	0.01	(0.02)
Firm Type	0.43**	(0.11)	0.43**	(0.11)	-0.01	(0.04)	-0.01	(0.04)	0.01	(0.04)	0.00	(0.04)	-0.04	(0.06)	-0.03	(0.06)
Firm Age	-0.00	(0.00)	-0.00	(0.00)	0.00	(0.00)	0.00	(0.00)	-0.00	(0.00)	-0.00	(0.00)	-0.00	(0.00)	-0.00	(0.00)
Foreign Owner	-0.04	(0.03)	-0.05	(0.03)	0.01	(0.01)	0.01	(0.01)	0.01	(0.01)	0.01	(0.01)	0.00	(0.02)	0.00	(0.02)
Export	0.02	(0.08)	0.02	(0.08)	0.04	(0.04)	0.04	(0.04)	0.02	(0.04)	0.02	(0.04)	0.01	(0.04)	0.01	(0.04)
Education	0.00*	(0.00)	0.00*	(0.00)	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)
Education Obstacle	0.10	(0.06)	0.09	(0.06)	-0.05+	(0.03)	-0.05+	(0.03)	0.04	(0.03)	0.04	(0.03)	0.06	(0.04)	0.06+	(0.04)
Training	0.16*	(0.07)	0.17*	(0.07)	0.08*	(0.03)	0.08*	(0.03)	0.04	(0.03)	0.04	(0.03)	0.10*	(0.04)	0.10*	(0.04)
Knowledge Management System	-0.11**	(0.04)	-0.15**	(0.05)	0.33**	(0.02)	0.31**	(0.03)	0.36**	(0.02)	0.33**	(0.03)	0.26**	(0.03)	0.29**	(0.03)
Knowledge Coordinator	0.20**	(0.03)	0.15**	(0.04)	0.12**	(0.02)	0.12**	(0.02)	0.20**	(0.02)	0.22**	(0.02)	0.20**	(0.02)	0.17**	(0.03)
Independent variables																
Temporary Employment	0.04*	(0.02)	-0.25**	(0.08)	0.01	(0.01)	-0.05	(0.06)	-0.01	(0.01)	-0.08	(0.06)	-0.03*	(0.01)	-0.01	(0.07)
Temporary Employment * Knowledge Management System			0.04+	(0.02)			0.01	(0.01)			0.03+	(0.01)			-0.02	(0.02)
Temporary Employment * Knowledge Coordinator			0.04*	(0.02)			-0.00	(0.01)			-0.01	(0.01)			0.02+	(0.01)
Model fit																
Model Significance	0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
R^2	15.3%		15.9%		43.9%		43.9%		50.8%		50.8%		33.5%		34.2%	

+ p<0.10, * p<0.05, **p<0.01.

statistically significant. As such, these results do not support hypothesis 2. Similarly, the results of model 5 show that temporary employment does not significantly impact knowledge transformation. Again the coefficient has the expected, in this case, negative sign but does not reach statistical significance leading us to reject hypothesis 3.

The results of model 7 show that temporary employment has a significant negative effect on knowledge exploitation. More specifically, the difference between one standard deviation below and above the mean in terms of temporary employment accounts for a -0.12 SD decrease in a firm's capacity to exploit new external knowledge. This represents a decrease in a firm's capability to exploit new external knowledge by 6.9 percent. This means that hypothesis 4 is supported and that temporary employment is found to significantly decrease a firm's ability to exploit knowledge.

With regard to hypothesis 5 and 6 we find overall support for the notion that the strength of a firm's knowledge management system and knowledge coordinator influences the effects of temporary employment on AC. The effects are especially pronounced for knowledge acquisition (model 2). The interaction effects are such that firms that score close to the minimum (score of 1 or 2 out of 6) on knowledge management and knowledge coordination do not benefit from temporary employment at all in terms of knowledge acquisition. Firms that score 3 or higher for knowledge management and knowledge coordination (75% of the firms in our sample do so) the benefits become positive and statistically significant with the effects becoming more and more pronounced for higher scores of the two knowledge integration mechanisms. We do not find this effect for knowledge assimilation, however.

For knowledge transformation we find that the strength of a firm's knowledge management system can mitigate the negative effect of temporary employees and this dimension of AC (model 6). For knowledge exploitation a similar mitigating effect is found but this time of the strength of a firm's knowledge coordinator. The magnitude of both interaction effects is such that for firms that score 5 or 6 on these knowledge integration mechanisms (15% of the firms in our sample do so) can completely offset the negative effects of temporary employment on their realized AC.

10. Robustness tests

To assess the sensitive of our results to the specific way we measured our variables of analyzed the data we performed several robustness tests. First, we changed the measurement of the dependent variable by creating a single measure for potential AC (by taking the average of a firm's score for acquisition and assimilation) and one for realized AC (by taking the average of a firm's score for transformation and exploitation). We subsequently used these two variables as dependent variables using the same set of explanatory variables as in our main analyses. The results are in line with those reported in Table 4 in that temporary employment has a positive effect on potential AC and a negative effect on realized AC and that these effects are amplified (in the case of potential AC) or diminished (for realized AC) by the strength of the knowledge management system and knowledge coordinator.

Second, as not all firms make use of temporary employees we re-ran our regressions: 1) using a dummy measure of the use of temporary employees as our main independent variable, and 2) excluding all firms without any temporary employees from the sample. These models yielded results that are identical in terms of coefficient sign and significance to those reported in Table 4. For the latter analysis we do find substantially bigger effect sizes indicating that the extent to which firms rely on temporary employees is more important for their AC than the fact that they use temporary employees.

Third, we ran split-sample analyses for small (<50 employees) and large (>=50 employees) and for firms in supplier-dominated industries versus other industries. The results of these models are highly similar to those reported in Table 4. Some small differences in statistical significance levels occur due to the drop in the number of observations used in these models. Qualitatively, the only difference is that the negative effect of temporary employees on the exploitation dimension of AC is bigger for large firms as compared to small firms.

Finally, we re-ran our regressions interchangeably excluding one of our control variables at a time. All of these analyses resulted in results identical in terms of coefficient signs and significance to those reported in the paper. The results of all these additional analyses are available from the authors on request.

11. Discussion

This research adds to AC literature in identifying a thus far overlooked controversy. We find that one organizational practice, temporary employment, significantly impacts both potential and realized AC, however with an opposite effect direction. This insight is critical for AC research, as the dimensions of AC are complementary and by themselves insufficient to successfully absorb new external knowledge. Furthermore, we expand research on AC to the unique context of developing countries (Badir et al., 2020). The developing countries participating in this research are characterized by high dynamism (Peng et al., 2007) and by a scarcity of human capital (van Uden et al., 2017). Both characteristics make this understudied research context particularly interesting (George et al., 2012) and allow to make thus far implicit assumptions explicit.

Our research contributes to the literature AC in two ways. First, we identify a thus far overlooked controversy between the requirements of the AC dimensions (Jansen et al., 2005). We find that one frequently employed organizational practice, temporary employment, has an opposite effect direction on potential and realized AC. More specifically, we unveil that temporary employees allow firms to excel at identifying and acquiring new external knowledge but harm their ability to ultimately exploit this knowledge commercially. As such, we identify one reason for the aforementioned challenge firms frequently face (Zahra and George, 2002): they can increase their knowledge stock but cannot reap the benefits from exploiting it.

Identifying that one organizational practice has a contradicting effect on different AC dimensions has important implications for AC theory. We demonstrate that AC research should conceptualize and measure AC in its multidimensional nature. In contrast to the frequently used practice of relying on unidimensional proxies such as RandD to measure AC (George et al., 2001; Tsai, 2001), this allows us to capture the 'richness of the construct' (Volberda et al., 2010, p. 937). If we had only analyzed the effect temporary employees have on a firm's overall AC level, we would have overlooked two important insights. We would not have been able to distill the significant impact temporary employees have on the two identified AC dimensions as the opposite effect directions may have cancelled each other out. Furthermore, we would not have been in a position to identify that one organizational practice can contrarily impact different AC dimensions.

Furthermore, we uncovered two organizational practices that can enhance the benefits a firm draws from temporary employees for potential AC and at the same time mitigate the negative effect on realized AC. Utilizing the knowledge embodied in temporary employees requires temporary and permanent employees to recognize each other's knowledge and openly share it (Badir et al., 2020; Jansen et al., 2005). Both knowledge management systems and knowledge coordinators can stimulate this process. Or findings resonate well with extant research in the field of open innovation where one of the core questions is how firms can benefit from externally available knowledge (West and Bogers, 2014). By showing that the internal practices of a company strongly influence the extent to which a firm can identify and internalize external knowledge we contribute to connecting the intra-organizational and the extra-organizational dimensions of open innovation (Bogers et al., 2017).

Given that these knowledge integration mechanisms can solve the contradiction between the effect of temporary employees on different

dimensions on AC this finding has important practical implications as well. Firms that (need to) rely on high levels of temporary employment are much better off if they also invest in strong knowledge management systems and/or knowledge coordinators. Doing so ensures that firms can have their cake (i.e. amplify the inflow of knowledge obtain from these temporary employees) and eat it too (i.e. exploit knowledge flowing into their organization effectively).

Accordingly, this research may inspire future researchers to detect additional organizational practices that play similar roles. We would, for example, expect that organizational practices, which foster communication and trust between employees can also help firms to overcome the negative effect of temporary employees on AC. In a trust-based relationship, individuals rely on reciprocity in that the voluntary benefit one party provides to another obliges the receiving party to reciprocate by providing a benefit in return. The importance of trust in the employment relationship varies between permanent and temporary employees (Zhang et al., 2008). The afore-described trust-based relationship applies predominantly to permanent employees. In temporary employment relationships, there 'is neither the incentive nor the need to develop trust […] by either party' (Zhang et al., 2008, p. 114). Hence, we anticipate that openness to share knowledge will be primarily fostered by offering a monetary reward for demonstrating the desired behavior in the setting of 'calculus-based trust' (Rousseau et al., 1998, p.399). It would be interesting for future research to generate a better understanding of whether trust-enhancing measures, such as a buddy system for permanent (Herrera, 2001) and financial rewards for temporary employees, can mitigate the negative effect of temporary employees on knowledge exploitation.

Second, the developing country context of this research sets it apart from previous studies. It answers the call of scholars to include developing countries in mainstream research (George et al., 2012) on the one side and its unique characteristics serve to enrich existing theories on the other side. Several characteristics of developing countries add to the particular relevance of conducting research in this context. Developing countries are, much more than developed countries (Peng et al., 2007), subject to high uncertainty, change, and dynamism (Barnard et al., 2017; van Uden et al., 2018). These external triggers prompt firms to build AC (Zahra and George, 2002) and firms in developing countries can, therefore, be expected to have pronounced levels of AC. At the same time, the developing countries participating in this research are challenged by scarcity of human capital, which subsumes the formal education and on-the-job training of individuals (Al-Laham et al., 2011). As related knowledge has been previously established to be an important prerequisite of AC (Cohen and Levinthal, 1990), one could assume that human capital scarcity may limit firms' AC. Our research however suggests that the scarcity of human capital (education obstacles) does not harm firms' AC since facing a shortage of educated employees does not significantly decrease a firm's capability to absorb new external knowledge. Rather than the available knowledge level, it is instrumental for firms to successfully manage the available knowledge internally (Badir et al., 2020). Our research supports points to the previously established importance of training (Muscio, 2007), knowledge management (Lane et al., 2006) and knowledge coordination (Roberts, 2015) for a firm's ability to successfully absorb new external knowledge. As such, by conducting research in a thus-far understudied context characterized by human capital scarcity, we can challenge implicit assumptions of AC theory. We suggest that a firm's capability to internally manage the available knowledge levels is more important than the level of available knowledge itself.

12. Limitations and future research

Of course, our research is not without limitations. One main limitation of our paper is that it cannot establish a causal link between the use of temporary employees and AC. Another limitation of our research is that we do not account for the type of knowledge temporary employees bring to a firm. It would be interesting for future research to account for the educational background, expert knowledge and industry experience of temporary employees since these might have differential effects on absorptive capacity. Another limitation of our research, which should be addressed by future studies, is our limited understanding of why firms hire temporary employees (de Jong et al., 2007).

We expect that firms, which hire temporary employees for their expert knowledge, may be more open to the knowledge and views of temporary employees compared to firms hiring them solely to cut costs or answer short-term labor demands. We propose that the positive impact of temporary employees on AC will be particularly pronounced for firms that hire temporary employees specifically for their knowledge. As such, it is likely that interesting moderators that amplify or weaken the relations we assessed can be found. For firms with specific recruitment and on-boarding practices in place it could very well be that the effect of temporary employees on knowledge assimilation also becomes statistically significant. Equally interesting would be assessing whether specific organizational practices can shield organizations from the negative effects of temporary workers on knowledge exploitation.

Despite these limitations, the results of our research reveal that one organizational practice can both benefit and harm the different dimensions of AC. More specifically, we find that temporary employment allows firms to better acquire new external knowledge on the one hand and undermines their ability to commercially exploit this knowledge on the other hand. In revealing this controversy, the results of our research propose that the underlying mechanisms of the four AC differ to a larger extent than previously accounted for and that they may even be counteracting.

CRediT authorship contribution statement

Daniela Ritter-Hayashi: Conceptualization, Data curation, Formal analysis, Methodology, Writing – original draft. **Joris Knoben:** Conceptualization, Formal analysis, Funding acquisition, Investigation, Methodology, Supervision, Validation, Visualization, Writing – review & editing. **Patrick A.M. Vermeulen:** Conceptualization, Funding acquisition, Project administration, Supervision, Writing – review & editing.

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