

8-26-2021

Does market digitalization always benefit firms? The Latin American case

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Recommended Citation

Angelica M. Sanchez-Riofrio, Nathaniel C. Lupton, and John Gabriel Rodríguez-Vásquez. "Does market digitalization always benefit firms? The Latin American case" *Management Decision* (2021).
<https://doi.org/10.1108/MD-01-2021-0117>

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Does market digitalization always benefit firms? The Latin American case

Journal:	<i>Management Decision</i>
Manuscript ID	MD-01-2021-0117.R1
Manuscript Type:	Original Article
Keywords:	Digitalization, market digitalization, restructuring, business portfolio restructuring, corporate performance, institutional environment

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ABSTRACT:

Prior research has found that firms' adoption of digital technologies (i.e. digitalization) enhances transaction efficiency and improves firm performance. However, this finding is based on the assumption that firms respond to consumers' adoption of digital technology (market digitalization) in a timely fashion. Our study investigates the impact of market digitalization on firm performance in Latin America, where resistance to change is often higher, despite the positive impact on performance when companies respond to the environmental shock of digitalization by restructuring.

Using data from seven Latin American countries from 1997 to 2018 (Argentina, Brazil, Chile, Colombia, Peru, Venezuela, and Mexico), fixed-effects panel regression robustly supports our results.

Most Latin American firms fail to capitalize on the benefits of market digitalization and their performance declines as a result. We extend research on digitalization by incorporating theoretical insights from the restructuring literature, finding that implementing a substantial restructuring strategy is a viable way to overcome market digitalization.

CUST_RESEARCH_LIMITATIONS/IMPLICATIONS__(LIMIT_100_WORDS) :No data available.

CUST_PRACTICAL_IMPLICATIONS__(LIMIT_100_WORDS) :No data available.

CUST_SOCIAL_IMPLICATIONS_(LIMIT_100_WORDS) :No data available.

We demonstrate that the digitalization-firm-performance relationship is more complex than has been described in studies using samples from developed economies. We establish restructuring as an effective adaptation strategy in Latin America, although the institutional environment's characteristics may constrain or discourage firms from adopting it.

1. Introduction

Digitalization is the socio-technical process of leveraging digital technologies to enhance the efficiency of economic transactions (Rubino *et al.*, 2020; Warner and Wäger, 2019). Digital technologies can be adopted to varying degrees by governments, individual households, and firms (Ardito *et al.*, 2019). The digitalization index of an economy is the aggregate of all these activities (ITU, 2019). The literature has identified two main perspectives for digitalization studies: the digitalization of consumption (i.e. market digitalization) (Barcena, 2016; Katz and Callorda, 2018; Sein and Harindranath, 2004); and the digitalization of production (Esselaar *et al.*, 2007; Mithas *et al.*, 2012). Market digitalization refers to the size of the digitalized market (e.g. number of people with broadband access, use of internet and ICT skills), while the digitalization of production refers to the investment in digital technologies and services by companies to improve transaction efficiency and reach a wider market (Katz and Callorda, 2018).

Studies in developed countries have consistently found a positive relationship between firm digitalization and firm performance, despite the potentially disruptive effect of technology (Bouwman *et al.*, 2019; Ferreira *et al.*, 2019; Mithas *et al.*, 2012). This overall finding demonstrates that firms typically respond to digital changes in a timely fashion (Ardito *et al.*, 2018). Studies in emerging economies such as Africa and Asia, however, have found mixed effects of digitalization on firm performance (Bogoviz *et al.*, 2019; Chauhan *et al.*, 2020). These mixed findings can be attributed to different conceptualizations of digitalization, without making a distinction between firm and market digitalization. For instance, Bogoviz *et al.* (2019) asserted that, in developing countries, economic actors such as consumers and firms initiate the digitalization process, but that developed countries follow a directive approach (i.e. state initiatives). In developing countries, firms prioritize short-term financial goals through cost control and reduction before considering longer term investments in digitalization.

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3 Similarly, Chauhan *et al.* (2020) identified extrinsic barriers in emerging countries, related to
4 national culture and context, such as contractual and legal uncertainty that adversely impact
5 the adoption of technology, which could further reduce firm performance in the presence of
6 market digitalization. Furthermore, Katz and Callorda (2018) argued that the digitalization of
7 consumption and the digitalization of production are two independent measures of
8 digitalization, which may have a combined impact on firm performance (Büchi *et al.*, 2020).
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12 To resolve the inconsistencies in prior research on digitalization and firm performance,
13 we apply institutional theory, incorporating the contextual element of organizational inertia on
14 the relationship between market digitalization and firm performance. We argue that, when a
15 firm is unresponsive to market digitalization, it not only fails to capitalize on the potential
16 benefits of digitalization, but its performance actually declines because it is at a relative
17 competitive disadvantage to firms that do adapt. We argue that this type of inertia is more
18 common when: (a) the competition is oligopolistic and dominated by family-owned firms or
19 by business groups; (b) when technological capabilities are not prevalent; and (c) institutional
20 voids constrain entrepreneurship (Cuervo-Cazurra *et al.*, 2019). Since Latin American
21 economies possess many of these qualities (Cuervo-Cazurra, 2008), their firms may be slower
22 to respond to digitalization than those in other emerging and developed economies.
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44 When managers face external shocks (such as market digitalization) and corporate
45 decline, they may, to varying extents, respond through corporate restructuring (hereafter,
46 referred to as restructuring) (Hoskisson *et al.*, 2004; Singh *et al.*, 2017). For example, when the
47 environment is changing (e.g. due to financial crises, privatization policies, or digitalization),
48 “firms that restructure their set of businesses may improve the chances of achieving synergies
49 and increase performance” (Hoskisson *et al.*, 2004, p.525). Diversification and
50 internationalization have been widely studied in the Latin American context (Aguilera *et al.*,
51 2017; Cuervo-Cazurra, 2008); however, although restructuring has impacted almost every
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3 sector of the US and European economies, its study in Latin America is far less developed
4 (Hoskisson *et al.*, 2004, 2005). Notably, highly diversified business groups dominate Latin
5 America due to their ability to bridge and overcome institutional voids (Cuervo-Cazurra *et al.*,
6 2019). However, as market-oriented institutional changes arise, business groups are resistant
7 to making changes that would cause them to incur high organization costs (Hoskisson *et al.*,
8 2005). Thus, restructuring is necessary when adapting to changes in the business environment,
9 but this strategy involves a substantial reallocation of the company's assets, with some firms
10 unwilling or unable to change. Hence, we also examine the extent to which restructuring alters
11 the relationship between market digitalization and firm performance in Latin America.
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25 We tested our hypothesized relationships between market digitalization and firm
26 performance, as well as the moderating role of restructuring, using a sample of companies from
27 seven Latin American countries (Argentina, Brazil, Chile, Colombia, Peru, Venezuela, and
28 Mexico) during 1997–2018. Our findings support our prediction that market digitalization
29 harms firm performance in Latin America, which we argue is due to incumbent firms' inertia
30 towards adapting to consumer preferences for interconnectivity and globalized digital content
31 and services. However, when companies restructure, our results also suggest that they are able
32 to overcome the negative impact of market digitalization, and their performance subsequently
33 improves substantially.
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46 Our research makes two main contributions to the existing literature on digitalization.
47 First, by focusing on Latin American countries – an understudied yet important region – we
48 add to institutional theory regarding the notion of organizational inertia (Cuervo-Cazurra *et al.*,
49 2019). We provide empirical evidence that market digitalization in emerging economies may
50 hurt business performance due to this inertia (Cuervo-Cazurra, 2008). This result extends the
51 literature by demonstrating that the digitalization–firm-performance relationship is more
52 nuanced than has been described in studies using samples from developed economies
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(Bouwman *et al.*, 2019; Ferreira *et al.*, 2019; Mithas *et al.*, 2012). Specifically, the digitalization–firm-performance relationship is different in developing countries, as compared to developed countries, due to the greater degree of oligopolistic competition, the absence of financial markets, and the lack of policy support (Chauhan *et al.*, 2020; Cuervo-Cazurra *et al.*, 2019). In order to empirically test this relationship, we first study market digitalization separately, providing an alternative perspective on its effect on firm performance. Second, we extend current digitalization research by incorporating theoretical insights from the restructuring literature (Forcadell *et al.*, 2020). We offer evidence that suggests that restructuring is a viable strategy for mitigating the negative impact of digitalization on firm performance.

2. Theoretical background and hypotheses development

2.1 Digitalization in Latin American countries

Research on the relationship between digitalization and firm performance is substantial, but a consensus on the nature of this relationship has yet to emerge (Bouwman *et al.*, 2019). In the context of developed countries, most prior studies have found a positive relationship for several reasons (Ferreira *et al.*, 2019; Mithas *et al.*, 2012). For example, digitalization enables firms to develop more products and enter new markets at lower costs (Ray *et al.*, 2013). Thus, digitalization can increase performance by facilitating cost savings. Digitalization, and in particular ICT adoption, also enables strategic cooperation between firms with complementary resources and capabilities (Casseta *et al.*, 2019). Digitalization enables firms to improve their efficiency and customer service, leading to greater profitability in the long run (Bouwman *et al.*, 2019). Likewise, digitalization enables efficient global sourcing and higher organizational flexibility in response to multiple stakeholders now interconnected by digitized business processes (Mithas *et al.*, 2012). Overall, digitalization has the potential to increase firm

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3 revenues by allowing firms to offer new products and enhance customer service (Ferreira *et*
4 *al.*, 2019). However, this improvement is achieved only on the assumption that firms respond
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6 to digital changes in a timely fashion, through *firm* digitalization.
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11 Counter to what has been found in developed economies like Europe and the US, studies
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13 from developing economies, such as in Africa, have shown a negative or null relationship
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15 between digitalization and firm performance (Esselaar *et al.*, 2007). Benavente *et al.* (2011)
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17 also theoretically predicted that this would be the case in Latin America, especially when firms
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19 fail to adapt due to organizational inertia (Sebastian *et al.*, 2017). The reason, we argue, is not
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21 because consumers are slow to adopt technology and use it for consumption. Indeed, Latin
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23 American consumers, like those in other emerging economies, are quick to adopt technology
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25 and to e-commerce. For instance, social-network market penetration in Latin American markets
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27 is the highest in the world (Benavente *et al.*, 2011). Internet penetration in Latin America, for
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29 example, was 61.5% in 2016 and 71.5% in 2020 (Pick *et al.*, 2021). The market digitalization
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31 of Latin American countries is usually founded on young people who are eager to adopt new
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33 technologies (Pick *et al.*, 2021). By 2019, around 24.2% of the population of Latin America
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35 and the Caribbean was between 0 and 14 years old, 67.1% was between 15 and 64, and 8.7%
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37 was 65 years old and over (Statista, 2021), while 69% of all mobile connections were for
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39 smartphones (Statista, 2020). Furthermore, due to security concerns and the lack of reliable
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41 public and private transportation, Uber is used more in Latin America than in the US, making
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43 Latin America the fastest growing and most promising market for Uber (Moed, 2018). In this
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45 scenario, new competition (national and international) exploits new technologies to serve
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47 unsatisfied customers (Ceipek *et al.*, 2020). Another reason why the market in developing
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49 countries may be changing faster than the rate at which firms are adopting digital technology
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51 is that, due to lack of government support and infrastructure, it is more expensive for firms to
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53 adopt digital technologies (Bogoviz *et al.*, 2019). Combined with the less affluent markets of
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3 Latin America, this increased expense makes it both more expensive and less lucrative to invest
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5 in digital technologies (Ceipek *et al.*, 2020).
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9 Another example of a less dynamic industry in Latin America is the banking sector. It
10 has enjoyed decades of monopolistic control, as evidenced by the forcing of customers to wait
11 in long lines for service (Ozy, 2019). By 2017, around 49% of the population (15+ years old)
12 in long lines for service (Ozy, 2019). By 2017, around 49% of the population (15+ years old)
13 held a bank account (Global Findex, 2017). Meanwhile, 73% of the population has mobile
14 held a bank account (Global Findex, 2017). Meanwhile, 73% of the population has mobile
15 phone access, and 69% of all mobile connections are for smartphones (Statista, 2020). Local
16 phone access, and 69% of all mobile connections are for smartphones (Statista, 2020). Local
17 banking firms, unsurprisingly, were less adaptive to changes in the demand environment until
18 banking firms, unsurprisingly, were less adaptive to changes in the demand environment until
19 new digital competitors, such as mobile payment systems, appeared.
20 new digital competitors, such as mobile payment systems, appeared.
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25 Moreover, Latin American business ecosystems vary substantially from those in Anglo-
26 American economies. First, the underdeveloped infrastructure, weak economic conditions, and
27 American economies. First, the underdeveloped infrastructure, weak economic conditions, and
28 inefficient institutions characterize this environment (Bogoviz *et al.*, 2019). Second, Latin
29 inefficient institutions characterize this environment (Bogoviz *et al.*, 2019). Second, Latin
30 American economies are made up of a mix of large and well-established firms in traditional
31 American economies are made up of a mix of large and well-established firms in traditional
32 industries[1] with small and micro-enterprises dominating the subsistence marketplace, while
33 industries[1] with small and micro-enterprises dominating the subsistence marketplace, while
34 conspicuously lacking in vibrant midsize companies (McKinsey Global Institute, 2019). Third,
35 conspicuously lacking in vibrant midsize companies (McKinsey Global Institute, 2019). Third,
36 many large firms are mainly family-owned and/or held by only a few large shareholders
37 many large firms are mainly family-owned and/or held by only a few large shareholders
38 (Cuervo-Cazurra *et al.*, 2019; Hoskisson *et al.*, 2004). Similarly, many Latin American
39 (Cuervo-Cazurra *et al.*, 2019; Hoskisson *et al.*, 2004). Similarly, many Latin American
40 companies have organized themselves into business group networks. Business groups are
41 companies have organized themselves into business group networks. Business groups are
42 defined as a set of firms with formal and informal ties that help coordinate their actions
43 defined as a set of firms with formal and informal ties that help coordinate their actions
44 (Aguilera *et al.*, 2017). As the institutional environment evolves, these large, diversified, and
45 (Aguilera *et al.*, 2017). As the institutional environment evolves, these large, diversified, and
46 sometimes informal structures make organizations less adaptive to change. For instance,
47 sometimes informal structures make organizations less adaptive to change. For instance,
48 family-owned business groups still predominate in Latin American economies, and their
49 family-owned business groups still predominate in Latin American economies, and their
50 dominance often reduces the intensity of competition and impedes organizational change
51 dominance often reduces the intensity of competition and impedes organizational change
52 (Cuervo-Cazurra, 2008). Due to the less dynamic competition and more expensive digital
53 (Cuervo-Cazurra, 2008). Due to the less dynamic competition and more expensive digital
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3 infrastructure, we predict that the market-digitalization–firm-performance relationship is likely
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5 to be negative in Latin America:
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9 *H1.* Market digitalization is negatively associated with Latin American firms'
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11 financial performance.
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14 **2.2 Restructuring as a strategic response to digitalization**

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16 Corporate strategies alter the scope and boundaries of the firm and can therefore partially
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18 explain why performance differs among companies (Singh *et al.*, 2017). Restructuring is a
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20 corporate strategy that involves the sale or divestment of unproductive assets and/or peripheral
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22 business lines and the reinforcing of critical activities through a more specialized and refocused
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24 composition of the businesses in the company (Hoskisson *et al.*, 2005). Through these
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26 operations, especially during a corporate decline, managers can discontinue business lines with
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28 weak competitive positions or that have low profitability (Bowman *et al.*, 1999).
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34 As one of the critical subject areas of corporate strategy research, restructuring has
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36 recently obtained renewed interest due to a series of changes in the global environment, such
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38 as rapid economic development, international competition, technology transitions, financial
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40 crises, and changes in government policies (Singh *et al.*, 2017). Changing environmental
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42 conditions, both endogenous and exogenous, make it necessary for managers to conduct
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44 periodic reviews of business activities, and sometimes restructure their assets according to their
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46 changing levels of returns (Schmitt *et al.*, 2016). Moreover, accelerated technological changes
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48 (e.g. digitalization) can render some of the firm's value-creating activities obsolete, reducing
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50 demand, and forcing the company to adapt, even while firm performance is already in decline
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52 (Schmitt *et al.*, 2016). Restructuring can be an effective response to digitalization because
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54 companies need to tailor their assets and functions to adjust to new market demands (Atluri *et*
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56 *al.*, 2017; Hoskisson *et al.*, 2004).
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3 A restructured company can be more resilient and better adapted to the new demands
4 of market digitalization for several reasons (Crittenden *et al.*, 2019). First, restructuring often
5 involves divesting and/or reconfiguring assets (Bowman *et al.*, 1999). Companies that have
6 implemented such changes tend to be more flexible in responding to external shocks like
7 digitalization. Second, restructuring a company's business portfolio can lead to better
8 performance in the short run. It quickly reduces organizational complexity and enables the firm
9 to be more responsive to emerging opportunities (Bergh and Lim, 2008; Hoskisson *et al.*,
10 2004). Third, although it might be challenging to reconfigure existing assets during heightened
11 uncertainty, the resulting new organizational capabilities can allow the firm to better respond
12 to new market demands and competitive conditions, thus improving its performance in the
13 longer run (Bergh and Lim, 2008). Finally, significant structural changes in the organization
14 resulting from restructuring can alter managers' attitudes and perspectives towards the
15 competitive landscape and the relevance of the firm's core competencies. This realigned
16 mindset can help managers more effectively discern threats and opportunities in their business
17 environments and respond accordingly (Hoskisson *et al.*, 2004).

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19 Hence, we predict that firms that restructure during market digitalization will
20 outperform those that do not. For instance, firms will choose to conduct transactions internally
21 when market transaction costs are high (Hoskisson *et al.*, 2004). After market digitalization,
22 previously costly transactions often become more efficient, such that a firm that decides to
23 reduce its boundaries through outsourcing and partnerships will see its performance rise, while
24 non-adapting competitors' performance declines (Hoskisson *et al.*, 2005).

25
26 Similarly, in Latin American countries, even if the government is slow to respond to
27 globalization forces through pro-market reform, digitalization creates pressures for firms to
28 adapt to a more efficient exchange environment, reducing the cost of external transactions (Ray
29 *et al.*, 2013). Moreover, as digitalization increases, global competition increases, new
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3 distribution channels are created, and more service providers become available (e.g. insurance,
4 storage, legal, and accounting services) in just a few clicks (Atluri *et al.*, 2017). The lower the
5 external transaction costs associated with producing an input outside the company, the more
6 likely it is that a firm will buy from an external supplier. Therefore, the company's willingness
7 to restructure increases and the firm prefers to remain focused, both vertically and in the
8 product markets within which it operates (Ray *et al.*, 2013).
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18 Restructuring unproductive assets may be appropriate for business groups to keep their
19 competitive advantage (Hoskisson *et al.*, 2005). Further, as firms decide to restructure, more
20 resources (e.g. cash) become available for investing in IT infrastructure, employee training,
21 etc. Simultaneously, the amount of corporate bureaucracy will decrease, reducing the firm's
22 organizational inertia and potentially leading to increased efficiency (Bowman *et al.*, 1999).
23 Furthermore, the narrower corporate scope can enable firms to specialize in their core activities,
24 thus concentrating their product and service offerings in their respective niches of global
25 markets (Aguilera *et al.*, 2017). We therefore expect that, in Latin America, restructuring
26 mitigates the negative impact of market digitalization on firm performance:
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40 *H2.* The negative relationship between market digitalization and firm performance
41 will be weaker when firms have implemented a restructuring strategy.
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46 **3. Data and methodology**

47 **3.1 Sample description**

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50 We retrieved all firm-level data, reported between 1997 and 2018, from the *Compustat Global*
51 database. Our sample includes all publicly listed firms from Argentina, Brazil, Chile,
52 Colombia, Mexico, Peru, and Venezuela, which constitutes the largest sample of firms
53 analyzed in Latin America in an empirical study of digitalization and restructuring to date
54 (Fernández *et al.*, 2010; Hoskisson *et al.*, 2004, 2005). These firms are broadly similar in size
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3 to those analyzed in the restructuring studies of Forcadell *et al.* (2020) and Girod and
4 Whittington (2016). The 21-year window allows us to track firms' restructuring and
5 performance through periods of increasing digitalization, while also allowing for extended lags
6 in the performance implications of digitalization and restructuring. As financial performance
7 is our dependent variable, we dropped firms with missing profitability data (i.e. net income).
8 The companies chosen are from different traditional industry sectors, including agriculture,
9 mining, construction, manufacturing, transport, wholesalers, and services. Financial and
10 banking services were excluded since their accounting methodology differs from other
11 companies (Forcadell *et al.*, 2020). For Latin American companies, the *Compustat Global*
12 database has more limited information than is available for firms from more developed
13 economies. For instance, data concerning digital ventures and venture capital funds were not
14 available. The initial sample consisted of 16,150 observations, corresponding to 1,231
15 companies during the period 1997–2018. The period was chosen to coincide with the
16 phenomenon of digitalization and to provide a complete set of data without missing values.
17 After lagging the explanatory variables and dropping cases with missing data for the variables
18 of interest, the final sample consisted of 10,711 observations, comprising 907 companies
19 during the period 1999–2018.

3.2 Variables and model

3.2.1 Dependent variable

20 Following prior studies on the restructuring–performance relationship (Bergh and Lim, 2008;
21 Park and Kim, 2008), we used return on assets (ROA), an efficiency-based measure of
22 performance, as our principal performance measure (Ceipek *et al.*, 2020). Efficiency measures
23 of performance are preferred to market-based measures in this study because digitalization
24 directly impacts firm operations, including the efficiency of supply chain management,
25 distribution, sales, and service. As explained in Section 4.1, we also estimated our models using
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3 alternate efficiency performance measures, including net margin (net income divided by total
4 revenue) and gross profit margin (total revenue minus cost of goods sold, divided by total
5 revenue). To reduce the effect of outliers, we winsorized all financial performance ratios (return
6 on assets, net margin, and gross profit) at cut points of 1% and 99% (Leone *et al.*, 2019).
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10 11 12 3.2.2 Explanatory variable 13

14 To assess the impact of country digitalization on Latin American firms, we generated a current
15 ICT Development Index (IDI)[2] applying the latest conceptual framework and methodology
16 provided by the International Telecommunication Union (ITU, 2019). This methodology was
17 used in the 2017 Measuring the Information Society Report (ITU, 2019). The IDI index was
18 calculated for each of the 20 years (from 1997 to 2016)[3].
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26 The IDI is measured on a ten-point scale, computed for 155 countries worldwide, that
27 combines 11 indicators classified into three categories, or sub-indices, each capturing the three
28 main stages in the evolution towards an information society: readiness; intensity; and
29 capabilities. As ICTs are development enablers (Sein and Harindranath, 2004), the IDI is
30 intended to measure the growth of assets relative to the rest of the world over time, as signals
31 of the development of an information society. The three dimensions of IDI are:
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- 40 1. *Access* (sub-index 40% readiness): measured by fixed-telephone subscriptions,
41 mobile-cellular telephone subscriptions, international internet bandwidth per
42 internet user, households with a computer, and households with internet access.
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- 45 2. *Use* (sub-index 40% intensity): individuals using the internet, fixed broadband
46 subscriptions, and mobile-broadband subscriptions.
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- 49 3. *Skills* (sub-index 20% capabilities): mean years of schooling, gross secondary
50 enrolment, and gross tertiary enrolment.
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56 We leave leading missing values as zero for missing values treatment but replace
57 intermediate missing values using a cubic spline methodology for accounting for the
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3 exponential growth curve of digitalization observed in our data (Allison, 2002). For the
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5 normalization method, we followed specific procedures to calculate the IDI (ITU, 2019). Due
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7 to the nature of our data, Latin American firms did not present digital information at the firm
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9 level.
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11 12 3.2.3 Moderating variable

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14 To assess the moderating effect of restructuring, we included the interaction of business
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16 portfolio restructuring (BPR) and digitalization. We followed the procedure outlined by
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18 Forcadell *et al.* (2020) in computing the BPR strategy. We identified cases of BPR when a
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20 company had divested at least 10% of its total assets. This percentage was chosen because it
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22 represents a significant reduction rather than a random fluctuation or gradual adjustment
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24 (Markides, 1995; Park and Kim, 2008). Divestments of business units were recorded using a
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26 dichotomous measure for BPR widely used in literature (Forcadell *et al.* 2020; Park and Kim,
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28 2008). While the critical value of 10% portfolio adjustment, chosen to indicate a significant
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30 restructuring event, is consistent with the literature, we also conducted a robustness test with a
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32 less substantial value of 5% (Park and Kim, 2008)[4].
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37 38 3.2.4 Control variables

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40 The dichotomous variable *Recession* identifies the periods with economic shocks (Singh *et al.*,
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42 2017). We identified two periods of economic recession in the Latin American economy: from
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44 1997–1999 (Singh *et al.*, 2017); and 2008–2014 (Camacho and Palmieri, 2017). We expect this
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46 variable to have a negative influence on performance (Forcadell *et al.*, 2020). Since larger firms
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48 typically perform better due to economies of scale and oligopolistic competition (Singh *et al.*,
49
50 2017), we controlled for the *Size* of the company using the log of total assets. We expect to
51
52 find a positive coefficient just as Forcadell *et al.* (2020). We also controlled for the *Leverage*
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54 of the company by including the logged ratio of debt to total assets (Markides, 1995); it is
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56 generally accepted that a high debt level will hurt performance. We also controlled for a firm's
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3 *Access to Resources*, deemed to have a positive impact on performance, using the current ratio
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5 (Singh *et al.*, 2017).
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8 Finally, we also included several country-level controls, including GDP, GDP growth,
9
10 and unemployment rate. All of these macroeconomic variables can positively impact firm
11
12 performance as they indicate more munificent environments for commerce (Bailey, 2018;
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14 Gliberman and Shapiro, 2003). We also intended to include GDP per capita to capture market
15
16 attractiveness but removed this from our final analysis due to high collinearity with other
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18 country factors.
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23 24 3.2.5 Estimation approach

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26 As our data has a panel structure with a high ratio of firm-to-year observations, so we used a
27
28 regression model with a decomposed error term to test our hypotheses (Allison, 2009). The
29
30 model estimated was as follows:
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$$35 ROA = \beta_0 + \beta_2 \times Digitalization + \beta_1 \times BPR + \beta_3 \times BPR \times Digitalization + \beta_4 \times$$

$$36$$

$$37 Recesson + \beta_5 \times Size + \beta_6 \times Access\ to\ Resources + \beta_7 \times Leverage + \beta_8 GDP + \beta_9$$

$$38$$

$$39 \times GDP\ Growth + \beta_{10} \times Unemployment + \mu_i + e_{it}$$

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45 where μ_i captures the firm-level disturbances and e_{it} represents the independently and
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47 identically distributed (IID) errors. Using a Hausman specification test, we found that firm fix-
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49 effects produced consistent estimates of coefficients and that a random-effects model was not
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51 more efficient than the fixed-effects model (chi-squared statistics: 153.87, $p=0.000$), and so we
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53 report the results of the fixed-effect model. Several transformations of variables were
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55 performed to improve the properties of their distributions before being entered into the
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57 regression. Specifically, *ROA* and *Digitalization* were winsorized (Leone *et al.*, 2019), and
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3 logged values were used for *Size*, *Leverage*, and *Access to Resources*. Finally, centered values
4 were used for *BPR* and *Digitalization* to facilitate the interpretation of their coefficients.
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6 Finally, we calculated variance inflation factors (VIFs), finding that no values were above 7
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8 and that the VIFs for the explanatory variables were all below 2.
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15 **4. Results**

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17 Table I presents cases of *BPR* during the period 1997–2018. Within the sample of 1,231
18 companies, 136 *BPR* events were found. However, cases from 2017 and 2018 were not used
19 in our model due to lagging their impact by two years. The proportion of firms that restructured
20 during our study window is in line with prior literature about emerging markets (Fernández *et*
21 *al.*, 2010; Hoskisson *et al.*, 2004). However, the proportion is smaller than in developed
22 markets where the restructuring process may involve two or more actions per company
23 (Forcadell *et al.*, 2020).
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33 <Insert Table I about here>
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39 Within the 12 years analyzed, a wave of *BPR* was identified, starting in 2007 and
40 peaking in 2008. Based on the primary SIC code, it was revealed that the main activities of
41 companies that were restructuring were manufacturing (46% of all cases), transport,
42 communication, and public services (28%), public administration (8%), construction (7%),
43 services (5%), distribution (3%), and agriculture (3%). These results are in line with Forcadell
44 *et al.* (2020), who categorized firms within the manufacturing and services sectors as having a
45 greater propensity to diversify and restructure. Table II shows the descriptive statistics and
46 correlation coefficients for all variables used in the model for testing hypotheses.
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<Insert Table II about here>

Table III presents the results of the model estimates used to test our hypotheses relating to the association of BPR and digitalization with firm performance. Model 1 is the baseline model, with only the control variables added, while Model 2 introduces the main explanatory variables, and Model 3 introduces the interaction term. All models include firm fixed-effects and are significant, with F -statistics ranging from 138 to 222.

<Insert Table III about here>

As shown in Model 1, the effect of recession years is negative, as expected, but the coefficient is not significant. The *GDP Growth* coefficient is positive and significant, as expected, but both *GDP*, measured in current USD, and *Unemployment* are negative and significant. Firm-level controls for *Size*, *Leverage*, and *Access to Resources* are all significant, with the expected signs (i.e. negative for *Leverage* and positive for *Size* and *Access to Resources*). The models account for between 29.1% and 29.4% of the *ROA* variance, consistent with other research on restructuring (Bergh and Lim, 2008). Although not shown here, firm fixed-effects account for about 47.6% of the variance in *ROA*, and the null hypothesis that the effect of unobserved firm-heterogeneity is zero is firmly rejected ($F=7.66$, $\text{Prob}>F=0.000$).

Model 2 introduces the main explanatory variables, *BPR* and *Digitalization*. *H1* predicted that digitalization is negatively associated with Latin American firms' financial performance. As shown in the results of testing Model 2, the coefficient is negative, supporting *H1*. The sign of the coefficient indicates that implementing a BPR strategy is positively related

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3 to a firm's performance. Both of these variables are lagged for two years to account for a
4
5 delayed association with firm performance. Finally, in Model 3, we introduce the interaction
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7 between *Digitalization* and *BPR* to test *H2*, which predicted that restructuring moderates the
8
9 relationship between *Digitalization* and firm performance. The positive and highly significant
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11 coefficient lends support to this hypothesis, and the magnitude suggests that implementing
12
13 restructuring allows a firm, on average, to overcome the small negative shock of *Digitalization*
14
15 completely. We plotted the interaction (see Figure 1) between restructuring and digitalization
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17 at two values of *BPR* (low=0=no restructuring, high=1= restructuring) and two values of
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19 *Digitalization* (low=mean-1 standard deviation, high=mean+1 standard deviation).
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33 **4.1 Robustness checks**

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35 We conducted several *post-hoc* tests using alternative model specifications to test the
36
37 robustness of our results. First, we measured firm size based on sales instead of assets. The
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39 results of this model were qualitatively similar to that of the model using assets. Second, we
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41 tried lagging the effect of *BPR* and *Digitalization* by one year, and then three, as it is not clear
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43 from prior research precisely how long it takes for restructuring to take effect. The models
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45 lagging these variables by one year and three years had qualitatively equivalent results. Both
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47 showed that *BPR* did not have a significant impact on *ROA*, while *Digitalization* still had the
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49 same negative effect, and the interaction between *BPR* and *Digitalization* was still positive.
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51 Hence, our results are relatively robust regarding the lag period considered (one, two, or three
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53 years), but the length of time before the impact of *BPR* alone is unclear.
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3 We also tried to use different periods corresponding to evolving macroeconomic
4 conditions in Latin America. For example, rather than including a *Recession* year indicator
5 variable, we also tried running our results for periods before and after recessions. Specifically,
6 we estimated models for years 2003–2016, 2005–2015, and 2003–2013. The models were
7 qualitatively consistent with our findings using the full dataset, and with the *Recession* variable
8 indicated, but of course had reduced power to detect relationships due to the smaller sample
9 size (i.e. while coefficients were all in the same direction as shown in Table III, they were not
10 all statistically significant). As the *Recession* year indicator was not statistically significant, we
11 ran the model without it and found virtually identical results to those shown here. The effect of
12 any recessionary periods may be already captured in the *GDP Growth* variable, although VIFs
13 did not indicate that collinearity was a major issue.
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31 **5. Discussion and conclusions**

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33 This study contributes to a deeper understanding of the digitalization–firm-performance
34 relationship by providing and empirically demonstrating a rationale for the mixed findings of
35 prior research. Although research on digitalization and firm performance is increasing,
36 including an emphasis on emerging or newly industrializing countries, there is no consensus
37 on whether market digitalization has a positive or negative association with firm performance
38 in developing countries. Our contribution sheds light on this ongoing debate. We found that
39 market digitalization is negatively associated to firm performance and partially attribute this
40 finding to the organizational inertia in responding to increasingly demanding clients, supply
41 chain interconnectivity, and globalized digital content and service provision (Sebastian *et al.*,
42 2017; Warner and Wäger, 2019). According to Bogoviz *et al.* (2019), in developing countries,
43 the initiators of the digitalization process are economic subjects rather than the state. If, for
44 example, digitalization adoption is extremely difficult for companies (e.g. lack of financial,
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3 legal, and technical support), they will delay its adoption. We empirically show that consumer-
4 led digitalization (market digitalization) affects business performance (in part due to this late
5 adoption of technology).
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11 Our results demonstrate that Latin American firms are slow to respond to digitalization.
12 Latin American companies usually see markets as traditional[1], and very few companies,
13 except telecommunications firms, have begun to take steps towards digitalization. Despite its
14 many benefits, including access to digital content and services, interconnectivity, and reduced
15 paperwork (Katz and Callorda, 2018), we can distinguish two possible reasons why market
16 digitalization is negatively related to firm performance in Latin American countries.
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25 First, some dominant incumbent firms are not readily adapting to the strategic
26 challenges of new technological paradigms (D'Ippolito *et al.*, 2019; Sebastian *et al.*, 2017).
27 Managers of these firms believe that their existing strengths and digital capabilities are enough
28 to sustain industry leadership. This perspective could lead to poorly adapted digital practices
29 (i.e. activities that include incorporating digital technologies into companies' routines). Inertia
30 theory could support this argument, positing that established routines, processes, and policies
31 inhibit a firm's adaptive responses to environmental change (Ceipek *et al.*, 2020). This lack of
32 adaptation is due to current operating models, organizational structures, routinized behavior,
33 and the high cost associated with organizational change (e.g. training, acquisition, and the
34 disposal of new and old assets, respectively) that discourage them from adopting new
35 technologies (Crittenden *et al.*, 2019).
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51 Second, as a result of digitalization, firms' clients become more demanding as they have
52 more choices, higher expectations, and more numerous service requests (Warner and Wäger,
53 2019). Likewise, many customers are replacing traditional channels with mobile apps, which
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3 reduces customers' costs for switching suppliers and provides unsatisfied clients with more
4 alternatives (Atluri *et al.*, 2017; Crittenden *et al.*, 2019).
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9 In the past decade, unexpected consumer behaviors (e.g. the emergence of the sharing
10 economy), disruptive competition, and revolutionary digital technologies have negatively
11 affected incumbent firms' performance due to the arrival of startups in the competitive
12 landscape (Crittenden *et al.*, 2019). Incumbent firms can implement internal innovation, adding
13 value for suppliers and customers, and developing new capabilities. For instance, Warner and
14 Wäger (2019) and Appio *et al.* (2021) identified several means to successfully respond to
15 digital transformation, such as sensing opportunities (and threats), seizing opportunities, and
16 transforming the organizational business model. Unfortunately, most Latin American
17 companies are still laggards in adapting to digital transformation compared to companies in
18 other emerging markets such as Asia (Pick *et al.*, 2021). Moreover, digitalization makes the
19 world smaller, so Latin American companies are no longer competing only among themselves,
20 but also with more digitalized companies worldwide (Correani *et al.*, 2020; Moed, 2018).
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37 Our study also empirically supports the prediction that the restructuring strategy of
38 divestment positively affects firm financial performance (Bergh and Lim, 2008; Bowman *et*
39 *al.*, 1999) and mitigates the decline in firm performance caused by digitalization. The countries
40 that present more restructuring events are Brazil, Chile, México, and Argentina. Even though
41 Latin American countries are often characterized as having underdeveloped institutional
42 environments, these latter four countries have the most favorable institutional conditions,
43 within Latin America, for pursuing a digitalization strategy (Hoskisson *et al.*, 2004). In line
44 with Hoskisson *et al.* (2005), our work shows that few companies restructure in emerging
45 markets compared to Anglo-Saxon and European companies. This is probably due to less
46 efficient markets that could otherwise encourage restructuring strategies. Those firms that
47 decided to restructure saw a positive result during a period characterized by rapid technological
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3 changes. Our finding of restructuring's moderating effect also indicates that, if Latin American
4 firms were quicker to restructure, they would be less likely to suffer from the acute adverse
5 effects of external shocks, such as digitalization. To that end, firms should be more vigilant in
6 monitoring and reacting to environmental trends. Governments should continue introducing
7 and strengthening pro-market reforms to encourage the development of more competitive and
8 more resilient enterprises. Government support for investment in reliable and lower cost digital
9 communications infrastructure is likely to lead to a much more robust and vibrant environment
10 for domestic firms.
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23 These findings also offer implications for managers. First, we validate the market-
24 digitalization–performance relationship in an institutional environment different from the
25 Anglo-Saxon and Eurocentric ones. For this reason, it is important that managers ask
26 themselves: “What strategies can I implement in my company to avoid market digitalization
27 adversely affecting our performance?” Subsequently, they must be able to identify those tools
28 that confer competitive and corporate advantages to the company. In this research, we propose
29 that a restructuring strategy is a viable response to changes in consumers' digital preferences.
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Second, the company's management must be vigilant of consumers rapidly adopting technological changes. If more consumers are adopting digital technologies, then is time (and probably more profitable) for the company to start updating their digital infrastructure. Third, this research also reveals insights for managers of firms in other geographic regions regarding the fact that market digitalization does not automatically improve firm performance. A firm that does not adopt IT will surely be at a disadvantage to more responsive competitors and customers. The challenge for managers and consultants is to incorporate digital platforms and change processes, and to empower the workforce to exploit new technologies and customers' demands. Finally, firms could partner with their governments to accelerate the country's digital transformation. One such example of a public and private alliance is the Costa Rica–Intel

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3 association. Under this agreement, in which both parties invested, economic and social progress
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5 for both was both achieved and sustained (OECD, 2018).
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9 Considering that similar characteristics are prevalent in some Latin American countries
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11 (Aguilera *et al.*, 2017; Aguinis *et al.*, 2020), it cannot be ruled out that the results of this work
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13 may be of interest to executives in other emerging economies with a similar institutional
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15 environment. The implications for government leaders include building an institutional
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17 environment with rules that encourage and facilitate the adoption of digitalization for both
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19 firms and consumers. Thus, companies are motivated to adopt the best managerial practices for
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21 handling disruptive situations that allow them to successfully navigate these precarious
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23 environments.
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27 Like all research, this study has limitations. As mentioned previously, we only studied
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29 one corporate strategy, restructuring, and we did not look at other possible responses to
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31 digitalization, such as diversification. Unfortunately, we could not access the composition of
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33 sales (domestic vs international) of the different business lines for each corporation in the Latin
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35 American section of the *Compustat Global* database. Future research should consider strategic
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37 responses to digitalization that alter the composition of sales, including business-line
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39 diversification/divestment, increased export performance, and many others. Also, the
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41 *Compustat Global* database only covers companies based in seven Latin American countries,
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43 and therefore not all Latin American countries were included in the study. In addition, while
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45 most papers have addressed digitalization at the firm level, we could not get this information
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47 from the Latin American section of the *Compustat Global* database. Aguinis *et al.* (2020)
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49 highlighted these data difficulties, and that is why there is a lack of large-scale empirical studies
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51 using information from this region. Moreover, several studies have suggested that the effect of
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53 digitalization is improved when it is followed by human capital training, decentralized decision
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55 making, and other organizational changes (Warner and Wäger, 2019). More work in emerging
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3 and developing countries will contribute to a finer-grained analysis of all these interactions in
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5 a different institutional environment. We hope this paper will motivate academics to build
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7 further research on digitalization and strategy, taking into account the institutional environment
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9 in Latin America.
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13 **Endnotes**

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15 1. According to Ma *et al.* (2019, p.1): “Traditional industries mainly refer to those labor-
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17 intensive, manufacturing, and processing industries (i.e., textile industry, shoe-making
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19 industry, petrochemical industry, paper products industry).”
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- 22 2. Data and methodology are available from the authors on request.
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- 24 3. Previous and later years to this period had too many missing values to be included in the
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26 study.
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- 29 4. We could also include a continuous variable. The results were almost the same.
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59
60

References

- Aguilera, R., Ciravegna, L., Cuervo-Cazurra, A. and Gonzalez-Perez, M. (2017), "Multilatinas and the internationalization of Latin American firms", *Journal of Business Research*, Vol. 52 No. 4, pp.447-590.
- Aguinis, H., Villamor, I. and Lazzarini, S. (2020), "Conducting management research in Latin America: Why and what's in it for you?", *Journal of Management*, Vol. 46 No. 5, pp.615-636.
- Allison, P.D. (2002), *Missing Data*, Sage, Thousand Oaks, CA.
- Allison, P.D. (2009), *Fixed Effect Regression Models*, Sage, Los Angeles, CA.
- Appio, F.P., Frattini, F., Messeni Petruzzelli, A. and Neirotti, P. (2021), "Digital transformation and innovation management: A synthesis of existing research and an agenda for future studies", *Journal of Product Innovation Management*, Vol. 38, pp.4-20.
- Ardito, L., D'Adda, D. and Messeni Petruzzelli, A. (2018). "Mapping innovation dynamics in the Internet of Things domain: Evidence from patent analysis", *Technological Forecasting and Social Change*, Vol. 136, pp.317-330.
- Ardito, L., Messeni Petruzzelli, A., Panniello, U. and Garavelli, A.C. (2019). "Towards Industry 4.0: Mapping digital technologies for supply chain management-marketing integration", *Business Process Management Journal*, Vol. 25, pp.323-346.
- Atluri, V., Dietz, M. and Henke, N. (2017), "Competing in a world of sectors without borders", *McKinsey Quarterly*, Vol. 54, pp.1-14.
- Bailey, N. (2018), "Exploring the relationship between institutional factors and FDI attractiveness: A meta-analytic review", *International Business Review*, Vol. 27, pp.139-148.
- Barcena, A. (2016). *The New Digital Revolution: From Consumer Internet to the Industrial Internet*. Economic Commission for Latin America and the Caribbean, Santiago.

- 1
2
3 Benavente, J., Lillo, N. and Turén, J. (2011), *ICT in Chilean Firms*. CEPAL, Santiago.
- 4
5 Bergh, D.D. and Lim, E. (2008), “Learning how to restructure: absorptive capacity and
6
7 improvisational views of restructuring actions and performance”, *Strategic*
8
9 *Management Journal*, Vol. 29 No. 6, pp.593-616.
- 10
11
12 Bogoviz, A.V., Osipov, V.S., Chistyakova, M.K. and Borisov, M.Y. (2019), “Comparative
13
14 analysis of formation of Industry 4.0 in developed and developing countries”, in
15
16 Popkova, E., Ragulina, Y. and Bogoviz, A. (Eds), *Industry 4.0: Industrial Revolution*
17
18 *of the 21st Century*, Studies in Systems, Decision and Control Vol 169, Springer,
19
20 Champagne, IL, pp.155–164.
- 21
22
23
24 Bouwman, H., Nikou, S. and Reuver, M. (2019), “Digitalization, business models and SMEs:
25
26 How do business model innovation practices improve performance of digitalizing
27
28 SMEs?”, *Telecommunications Policy*, Vol. 43, pp.1-18.
- 29
30
31 Bowman, E., Singh, H. and Useem, M. (1999), “When does restructuring improve economic
32
33 performance?”, *California Management Review*, Vol. 41 No. 2, pp.33-54.
- 34
35
36 Büchi, G., Cugno, M. and Castagnoli, R. (2020), “Smart factory performance and Industry
37
38 4.0”, *Technological Forecasting and Social Change*, Vol. 150 (January), e119790.
39
40 <https://doi.org/10.1016/j.techfore.2019.119790>
- 41
42
43 Camacho, M. and Palmieri, G. (2017), “Latin American cycles: Has anything changed after the
44
45 great recession?”, *Emerging Markets Finance and Trade*, Vol. 53, No. 5, pp.1170-
46
47 1183.
- 48
49
50 Cassetta, E., Monarca, U., Dileo, I., Di Berardino, C. and Pini, M. (2019), “The relationship
51
52 between digital technologies and internationalisation. Evidence from Italian SMEs”,
53
54 *Industry and Innovation*, Vol. 27, No. 4, pp.311-339.
- 55
56
57 Ceipek, R., Hautz, J., Messeni Petruzzelli, A., De Massis, A. and Matzler, K. (2020), “A
58
59 motivation and ability perspective on engagement in emerging digital technologies:
60

The case of Internet of Things solutions”, *Long Range Planning*, in press.

<https://doi.org/10.1016/j.lrp.2020.101991>

Chauhan, C., Singh, A. and Luthra, S. (2020), “Barriers to Industry 4.0 adoption and its performance implications: An empirical investigation of emerging economy”, *Journal of Cleaner Production*, Vol. 285, e124809.

<https://doi.org/10.1016/j.jclepro.2020.124809>

Correani, A., De Massis, A., Frattini, F., Messeni Petruzzelli, A. and Natalicchio, A. (2020), “Implementing a digital strategy: Learning from the experience of three digital transformation projects”, *California Management Review*, Vol. 62, pp.37-56.

Cuervo-Cazurra, A. (2008), “The multinationalization of developing country MNEs: The case of multilatinas”, *Journal of International Management*, Vol. 14 No. 2, pp.138-154.

Cuervo-Cazurra, A., Gaur, A. and Singh, D. (2019), “Pro-market institutions and global strategy: The pendulum of pro-market reforms and reversals”, *Journal of International Business Studies*, Vol. 50 No. 4, pp.598-632.

Crittenden, A., Crittenden, V. and Crittenden, W. (2019), “The digitalization triumvirate: How incumbents survive”, *Business Horizons*, Vol. 62 No. 2, pp.259-266.

D’Ippolito, B., Messeni Petruzzelli, A. and Panniello, U. (2019), “Archetypes of incumbents’ strategic responses to digital innovation”, *Journal of Intellectual Capital*, Vol. 20, pp.662-679.

Esselaar, S., Stork, C., Ndiwalana, A. and Deen-Swarrray, M. (2007), “ICT usage and its impact on profitability of SMEs in 13 African countries”, *Information Technologies and International Development*, Vol. 4 No. 1, pp.87-100.

Fernández, J., Garay, U. and Pablo, E. (2010), “Determinants of shareholders returns following announcements of asset sales: Evidence from Latin America”, *Revista Latinoamericana de Administración*, Vol. 45, pp.40-58.

- 1
2
3 Ferreira, J.J., Fernandes, C.I. and Ferreira, F.A. (2019), “To be or not to be digital, that is the
4 question: Firm innovation and performance”, *Journal of Business Research*, Vol. 101,
5 pp.583-590.
6
7
8
9
- 10 Forcadell, F.J., Sánchez-Riofrío, A.M., Guerras-Martín, L.A. and Romero-Jordán, D. (2020),
11 “Is the restructuring-performance relationship moderated by the economic cycle and
12 the institutional environment for corporate governance?”, *Journal of Business
13 Research*, Vol. 110, pp.397-407.
14
15
16
17
18
- 19 Girod, S.J.G. and Whittington, R. (2016), “Reconfiguration, restructuring and firm
20 performance: Dynamic capabilities and environmental dynamism”, *Strategic
21 Management Journal*, Vol. 38 No. 5, pp.1121-1133.
22
23
24
25
- 26 Global Findex (2017), “The Global Findex Database 2017”. Available at:
27 https://globalfindex.worldbank.org/index.php/#data_sec_focus (accessed 18 January
28 2021).
29
30
31
32
- 33 Globerman, S. and Shapiro, D. (2003), “Governance infrastructure and US foreign direct
34 investment”, *Journal of International Business Studies*, Vol. 34, pp.19-39.
35
36
37
- 38 Hoskisson, R. Cannella, A., Tihanyi, L. and Faraci, R. (2004), “Asset restructuring and
39 business group affiliation in French civil law countries”, *Strategic Management
40 Journal*, Vol. 25 No. 6, pp.525-539.
41
42
43
44
- 45 Hoskisson, R., Johnson, R., Tihanyi, L. and White, R. (2005), “Diversified business groups
46 and corporate refocusing in emerging economies”, *Journal of Management*, Vol. 31
47 No. 6, pp.941-965.
48
49
50
- 51 ITU (2019), “Measuring the Information Society Report 2017”. Available at:
52 <https://www.itu.int/en/ITU-D/Statistics/Pages/publications/mis2017.aspx> (accessed
53 15 November 2019).
54
55
56
57
58
59
60

- 1
2
3 Katz, R. and Callorda, F. (2018), “Accelerating the development of Latin American digital
4 ecosystem and implications for broadband policy”, *Telecommunications Policy*, Vol.
5
6 ecosystem and implications for broadband policy”, *Telecommunications Policy*, Vol.
7
8 42 No. 9, pp.661-681.
9
- 10 Leone, A.J., Minutti-Meza, M. and Wasley, C.E. (2019), “Influential observations and
11 inference in accounting research”, *The Accounting Review*, Vol. 94 No. 6, pp.337-364.
12
13
- 14 Ma, H., Sun, Q., Gao, Y. and Gao, Y. (2019), “Resource integration, reconfiguration, and
15 sustainable competitive advantages: The differences between traditional and emerging
16 industries”, *Sustainability*, Vol. 11 No. 2, pp.551-571.
17
18
- 19 Markides, C. (1995), “Diversification, restructuring and economic performance”, *Strategic*
20
21
22 *Management Journal*, Vol. 16 No. 2, pp.101-118.
23
24
- 25 McKinsey Global Institute (2019), “Latin America’s missing middle”. Available at:
26
27 <https://www.mckinsey.com/~/media/McKinsey/Featured%20Insights/Americas/Latin>
28
29 <https://www.mckinsey.com/~/media/McKinsey/Featured%20Insights/Americas/Latin>
30
31 <https://www.mckinsey.com/~/media/McKinsey/Featured%20Insights/Americas/Latin>
32
33 <https://www.mckinsey.com/~/media/McKinsey/Featured%20Insights/Americas/Latin>
34
35 <https://www.mckinsey.com/~/media/McKinsey/Featured%20Insights/Americas/Latin>
36
37 <https://www.mckinsey.com/~/media/McKinsey/Featured%20Insights/Americas/Latin>
38
39 <https://www.mckinsey.com/~/media/McKinsey/Featured%20Insights/Americas/Latin>
40
41 <https://www.mckinsey.com/~/media/McKinsey/Featured%20Insights/Americas/Latin>
42
43 <https://www.mckinsey.com/~/media/McKinsey/Featured%20Insights/Americas/Latin>
44
45 <https://www.mckinsey.com/~/media/McKinsey/Featured%20Insights/Americas/Latin>
46
47 <https://www.mckinsey.com/~/media/McKinsey/Featured%20Insights/Americas/Latin>
48
49 <https://www.mckinsey.com/~/media/McKinsey/Featured%20Insights/Americas/Latin>
50
51 <https://www.mckinsey.com/~/media/McKinsey/Featured%20Insights/Americas/Latin>
52
53 <https://www.mckinsey.com/~/media/McKinsey/Featured%20Insights/Americas/Latin>
54
55 <https://www.mckinsey.com/~/media/McKinsey/Featured%20Insights/Americas/Latin>
56
57 <https://www.mckinsey.com/~/media/McKinsey/Featured%20Insights/Americas/Latin>
58
59 <https://www.mckinsey.com/~/media/McKinsey/Featured%20Insights/Americas/Latin>
60
- 61

- 1
2
3 Ozy (2019), “How digital banks are breaking up Latin America’s finance monopolies”.
4
5 Available at: [https://www.ozy.com/around-the-world/new-finance-is-taking-on-latin-](https://www.ozy.com/around-the-world/new-finance-is-taking-on-latin-american-banking-monopolies/95208/)
6
7 [american-banking-monopolies/95208/](https://www.ozy.com/around-the-world/new-finance-is-taking-on-latin-american-banking-monopolies/95208/) (accessed 15 September 2020).
8
9
- 10 Park, C. and Kim, S. (2008), “Corporate governance, regulatory changes, and corporate
11
12 restructuring in Korea, 1993–2004”, *Journal of World Business*, Vol. 43 No. 1, pp.66-
13
14 84.
15
- 16 Pick, J., Sarkar, A., and Parrish, E. (2021). “The Latin American and Caribbean digital divide:
17
18 A geospatial and multivariate analysis”, *Information Technology for Development*,
19
20 Vol. 27 No. 2, pp.235-262.
21
22
- 23 Ray, G., Xue, L. and Barney, J. (2013), “Impact of information technology capital on firm
24
25 scope and performance: The role of asset characteristics”, *Academy of Management*
26
27 *Journal*, Vol. 56 No. 4, pp.1125-1147.
28
29
- 30 Rubino, M., Vitolla, F. and Raimo, N. (2020), “Cross-country differences in European firms’
31
32 digitalisation: The role of national culture”, *Management Decision*, Vol. 58 No. 8,
33
34 pp.1563-1583.
35
36
- 37 Schmitt, A., Barker, V., Raisch, S. and Whetten, D. (2016), “Strategic renewal in times of
38
39 environmental scarcity”, *Long Range Planning*, Vol. 49 No. 3, pp.361-376.
40
41
- 42 Sebastian, I., Ross, J., Beath, C., Mocker, M., Moloney, K. and Fonstad, N. (2017), “How big
43
44 old companies navigate digital transformation”, *MIS Quarterly Executive*, Vol. 16 No.
45
46 3, pp.197-213.
47
48
- 49 Sein, M.K. and Harindranath, G. (2004), “Conceptualizing the ICT artifact: Toward
50
51 understanding the role of ICT in national development”, *Information Society*, Vol. 20
52
53 No. 1, pp.15-24.
54
55
56
57
58
59
60

1
2
3 Singh, K., Mahmood, I. and Natarajan, S. (2017), "Capital market development and firm
4 restructuring during an economic shock", *Organization Science*, Vol. 28 No. 3, pp.552-
5
6 573.
7
8

9
10 Statista (2020), "Smartphone penetration in Latin America from 2018 to 2025". Available at:
11
12 [https://www.statista.com/statistics/218531/latin-american-smartphone-penetration-](https://www.statista.com/statistics/218531/latin-american-smartphone-penetration-since-2008/#:~:text=In%202018%2C%20smartphones%20accounted%20for,from%2067%20to%2073%20percent)
13
14 [since-](https://www.statista.com/statistics/218531/latin-american-smartphone-penetration-since-2008/#:~:text=In%202018%2C%20smartphones%20accounted%20for,from%2067%20to%2073%20percent)
15
16 [2008/#:~:text=In%202018%2C%20smartphones%20accounted%20for,from%2067%](https://www.statista.com/statistics/218531/latin-american-smartphone-penetration-since-2008/#:~:text=In%202018%2C%20smartphones%20accounted%20for,from%2067%20to%2073%20percent)
17
18 [20to%2073%20percent](https://www.statista.com/statistics/218531/latin-american-smartphone-penetration-since-2008/#:~:text=In%202018%2C%20smartphones%20accounted%20for,from%2067%20to%2073%20percent) (accessed 18 January 2021).
19
20

21 Statista (2021), "Latin America & Caribbean: Age distribution from 2009 to 2019". Available
22 at: [https://www.statista.com/statistics/699084/age-distribution-in-latin-america-and-](https://www.statista.com/statistics/699084/age-distribution-in-latin-america-and-caribbean/#:~:text=Age%20structure%20in%20Latin%20America%20%26%20Carib)
23
24 [caribbean/#:~:text=Age%20structure%20in%20Latin%20America%20%26%20Carib](https://www.statista.com/statistics/699084/age-distribution-in-latin-america-and-caribbean/#:~:text=Age%20structure%20in%20Latin%20America%20%26%20Carib)
25
26 [bean%202019&text=In%202019%2C%20around%2024.2%20percent,65%20years%](https://www.statista.com/statistics/699084/age-distribution-in-latin-america-and-caribbean/#:~:text=Age%20structure%20in%20Latin%20America%20%26%20Carib)
27
28 [20old%20and%20over](https://www.statista.com/statistics/699084/age-distribution-in-latin-america-and-caribbean/#:~:text=Age%20structure%20in%20Latin%20America%20%26%20Carib) (accessed 19 January 2021).
29
30
31
32

33 Warner, K. and Wäger, M. (2019), "Building dynamic capabilities for digital transformation:
34 An ongoing process of strategic renewal", *Long Range Planning*, Vol. 52 No. 3,
35
36 pp.326-349.
37
38
39
40
41
42
43
44
45
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Table 1.

Business process restructuring in Latin America during 1997-2018.

	Argentina	Brazil	Chile	Colombia	Mexico	Peru	Venezuela	Total
1997	0	0	0	0	0	0	0	0
1998	0	0	0	0	1	0	0	1
1999	1	3	4	1	0	0	0	9
2000	0	5	1	0	1	0	0	7
2001	0	2	2	0	0	0	0	4
2002	3	1	0	0	0	2	1	7
2003	0	2	0	0	0	0	0	2
2004	0	1	1	0	0	2	1	5
2005	1	0	0	0	0	0	0	1
2006	1	3	2	0	0	1	1	8
2007	3	3	4	0	2	0	1	13
2008	1	5	5	0	2	0	0	13
2009	1	3	2	1	0	0	0	7
2010	0	5	1	1	0	1	0	8
2011	0	4	1	0	2	0	0	7
2012	0	2	1	0	1	0	1	5
2013	0	2	0	0	2	0	0	4
2014	0	5	0	0	0	0	0	5
2015	2	5	0	0	1	0	0	8
2016	1	6	0	0	2	0	0	9
2017	1	6	0	0	2	0	0	9
2018	0	2	0	0	0	2	0	4
Total	15	65	24	3	16	8	5	136

Note. Restructuring cases in 2017 and 2018 were not used in the model tested in this study, as restructuring was hypothesized to have a delayed impact on firm performance. For example, restructuring in 2016 was hypothesized to have an effect on firm performance in 2018.

Table 2.

Descriptive statistics and correlations between variables

	Mean	1	2	3	4	5	6	7	8	9	10
1. ROA	0.011	(0.156)									
2. Recession	0.310	-0.022*	(0.310)								
3. GDP	0.000	-0.107*	-0.198*	(0.000)							
4. GDP growth	2.911	0.096*	-0.140*	-0.199*	(3.201)						
5. Unemployment	7.881	-0.092*	0.146*	-0.027*	0.062*	(2.912)					
6. Firm size	8.230	0.227*	-0.063*	-0.210*	-0.002	0.062*	(2.933)				
7. Leverage	-1.658	-0.324*	-0.004	0.127*	-0.083*	-0.002	-0.027*	(1.398)			
8. Access to resources	0.219	0.452*	-0.033*	-0.063*	0.022*	-0.083*	0.125*	-0.359*	(0.908)		
9. Restructuring	0.009	-0.007	0.024*	0.020*	0.022*	0.022*	-0.025*	0.009	-0.002	(0.095)	
10. Digitalization	3.551	0.011	-0.374*	0.336*	-0.141*	-0.156*	0.139*	0.018*	0.038*	0.010	(0.164)

Notes. All means, standard deviations, and correlations relate to the sample with no missing values on any of the variables of interest; 11,707 firm-years. Differences between this sample size and those in the regression results are due to the two-year lagging of explanatory variables, digitalization, and restructuring. Statistically significant correlations ($p < 0.05$; two-tailed tests) are indicated with an asterisk. The variables for firm size, leverage, and access to resources are logged. All variables are unstandardized.

Table 3.

Fixed effect regression analysis indicating the effects of digitalization and restructuring
on firm performance

<i>Dependent variable:</i>	Model 1	Model 2	Model 3
Return on assets			
Controls			
Recession year (dummy)	0.003 (0.002)	-0.002 (0.003)	-0.002 (0.003)
GDP	0.000*** (0.000)	0.000** (0.000)	0.000** (0.000)
GDP growth	0.003*** (0.0003)	0.003*** (0.0004)	0.003*** (0.0004)
Unemployment	-0.001 (0.0006)	-0.001** (0.0006)	-0.001** (0.0006)
Firm size (log total assets)	0.012*** (0.001)	0.013*** (0.001)	0.013*** (0.001)
Leverage (log debt to assets)	-0.020*** (0.001)	-0.019*** (0.001)	-0.019*** (0.001)
Access to resources (current ratio)	0.043*** (0.002)	0.042*** (0.002)	0.042*** (0.002)
Explanatory			
Digitalization		-0.004*** (0.001)	-0.004*** (0.001)
Restructuring (dummy)		0.028** (0.012)	0.024** (0.012)
Interactions			
Digitalization x restructuring			0.021*** (0.008)
Intercept			
	-0.120*** (0.011)	-0.130*** (0.012)	-0.130*** (0.012)
F	222.34	152.52	138.12
p	<0.001	<0.001	<0.001
R ²	0.291	0.294	0.294
Firm fixed effects	Yes	Yes	Yes
N	11,725	10,711	10,711

Notes. Firm size, leverage, and access to resources are logged. Digitalization and restructuring effects are lagged two years to account for delayed impact. Statistical significance is reported as *** p < 0.01; ** p < 0.05; * p < 0.1.

Figure 1.

Interaction of restructuring with digitalization

