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RESEARCH ARTICLE

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# Can entrepreneurial orientation improve sustainable development through leveraging internal lean practices?

Roberto Chavez[1] | Wantao Yu[2] | Muhammad Shakeel Sadiq Jajja[3] | Antonio Lecuna[4] | Brian Fynes[5]

[1]Department of Business Technology and Entrepreneurship, Swinburne University of Technology, Hawthorn, Victoria, Australia

[2]Roehampton Business School, University of Roehampton, London, UK

[3]Suleman Dawood School of Business, Lahore University of Management Sciences, Lahore, Pakistan

[4]School of Business and Economics, Universidad del Desarrollo, Santiago, Chile

[5]Smurfit Graduate School of Business, University College Dublin, Co. Dublin, Ireland

**Correspondence**
Roberto Chavez, Department of Business Technology and Entrepreneurship, Swinburne University of Technology, Hawthorn, Victoria 3122, Australia.
Email: rchavez@swin.edu.au

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## Abstract

This study aims to examine the mediating role of internal lean practices (ILPs) on the relationship between entrepreneurial orientation and triple bottom line performance (i.e. environmental, social, and operational performance). We examine Chile, which represents a vibrant economy and one of the world's most productive entrepreneurship ecosystems but with a history of socio-economic inequalities and strong profit-driven pressures to overextract natural resources. The study is based on a questionnaire related to manufacturing sent to 112 companies in Chile. The proposed relationships are analysed through structural equation modelling. The results indicate that ILPs fully mediate the effect of entrepreneurial orientation on environmental performance and social performance and partially mediates the effect of entrepreneurial orientation on operational performance. Our study extends the literature by explaining that entrepreneurial orientation builds and strengthens ILPs for creating triple bottom line competitive advantage.

KEYWORDS
entrepreneurial orientation, internal lean practices, sustainability, triple bottom line

## 1 | INTRODUCTION

Entrepreneurial orientation (EO) has become a promising research topic in the entrepreneurship literature (Wales, 2016). EO is described as the processes and actions that lead to new entry (Rauch, Wiklund, Lumpkin, & Frese, 2009) and is characterised by *innovativeness*, *proactiveness*, and *risk taking* (Covin & Slevin, 1989). There has been increasing interest in the relationship between EO and sustainability performance (Hall, Daneke, & Lenox, 2010), which considers three performance dimensions—environmental, social, and economic—collectively referred to as the triple bottom line (TBL) (Elkington, 1998; Henry, Buyl, & Jansen, 2019). Environmental performance refers to the efficient use of natural resources (Hall et al., 2010) and social performance concerns promoting well-being (Wu et al., 2015), whereas economic performance refers to operational and financial results of the firm (Martinez-Jurado & Moyano-Fuentes, 2014). This study focuses on operational performance as a key contributor to economic performance (Gimenez, Sierra, & Rodon, 2012; Martinez-Jurado & Moyano-Fuentes, 2014). However, given that sustainable entrepreneurship endeavours do not guarantee success owing to their inherently innovative and risky nature, some explanatory factors can help EO to reach more productive outcomes (Courrent, Chasse, & Omri, 2018). Specifically, recent entrepreneurship literature explores mediating effects on the relationship between EO and outcome variables (Karami & Tang, 2019). This represents a research opportunity for understanding how EO could better achieve TBL performance.

There has been increasing interest on the intersection of entrepreneurship and operations management (OM) (Hsu, Tan, Jayaram, Laosirihongthong, & Leong, 2014). Specifically, EO is recognised as a conduit for process transformation and improvement (Hall et al., 2010), helping manufacturing firms to leverage their operational capabilities (Handfield, Petersen, Cousins, & Lawson, 2009). Among these operational capabilities, internal lean practices (ILPs) have emerged as a prominent best practice, which refers to a set of manufacturing techniques that focus on the reduction of non-value-added activities (Chavez et al., 2015). Accordingly, EO could encourage manufacturing strategies such as ILPs, which are characterised by high productivity and a process focus to benefit from market opportunities (Rosenbusch, Rauch, & Bausch, 2013). Despite this line of reasoning affirming the intrinsic affinity between EO and ILP, existing literature has overlooked the relationship between them.

Similarly, although there has been increasing interest in the relationship between ILPs and TBL performance, empirical research in this direction is evolving (Martinez-Jurado & Moyano-Fuentes, 2014). Specifically, operational performance has received quite extensive research attention (Negrão, Godinho Filho, & Marodin, 2017), but more research is needed on the association between ILPs and social (Camuffo, De Stefano, & Paolino, 2017) and environmental performance (Lee & Klassen, 2016; Martinez-Jurado & Moyano-Fuentes, 2014). It has been suggested that the three dimensions of TBL performance should be considered simultaneously (Seuring & Muller, 2008), and most lean research has ignored this more integrative perspective of the TBL.

The above arguments concerning the positive association between EO and ILP, and between ILP and TBL performance, suggest implicitly that ILP may act as a mediating variable, which can be explained by the resource orchestration theory (ROT). ROT suggests that competitive advantage stems from how resources are managed and orchestrated (Sirmon, Hitt, Ireland, & Gilbert, 2011). ROT has been used to conceptualise EO as part of the resource orchestration process that provides the vision to use, direct, and identify resources (Wales, Patel, & Lumpkin, 2013). However, providing vision is not the same as the operational capability to orchestrate resources. In other words, whereas EO provides the essential behaviour and vision to identify resource bundles, ILPs provide coordination mechanisms to leverage EO resources into TBL performance.

For advancing knowledge on the relationship between entrepreneurship and OM, the above arguments present the following research questions:

1. To what extent does EO associate with ILPs?
2. To what extent do ILPs associate with TBL performance? and
3. To what extent is the relationship between EO and TBL performance mediated by ILPs?

The cross-disciplinary research at the intersection of entrepreneurship and OM can potentially lead to new insight and tangible benefits for both theory and practice. Specifically, this study examines the mediating role of ILPs on the EO–TBL performance link, which seeks to explain that entrepreneurship builds and strengthens ILPs for creating TBL competitive advantage. In doing so, this study endorses ROT as a theoretical lens to explain how TBL firms could better achieve their goals. This paper is also relevant for policymakers and manufacturing practitioners to understand how entrepreneurship posture can be greatly complemented by efficient manufacturing systems for a sustainable and balanced development.

## 2 | THEORETICAL BACKGROUND

### 2.1 | Resource orchestration theory

Resource-based view (RBV) has emerged as an influential theoretical framework for understanding how competitive advantage is achieved through a complex bundle of resources; however, the mere possession of such resources is insufficient to sustain competitive advantage (Eisenhardt & Martin, 2000). Scholars have extended RBV and proposed the ROT, which emphasises the importance of *how* rather than *what type of* resources can be used to create competitive advantage (and, by extension, firm performance) (Ketchen, Wowak, & Craighead, 2014). Orchestrating resources refers to three distinct dimensions: structuring a portfolio of resources, bundling resources to build capabilities, and leveraging and synchronising those capabilities (Chirico, Sirmon, Sciascia, & Mazzola, 2011). Among these dimensions, leveraging and synchronising resources is key for generating competitive advantage (Sirmon et al., 2011).

Drawing upon the logic expressed in the ROT, we suggest that EO, as a bundle of human and intangible resources, provides the essential vision and mobilising attitude to identify and implement resources such as ILPs. Further, we suggest ILPs act as a leveraging and synchronising mechanism for implementing new ideas, vision, and resources identified by EO for sustainable outcomes.

### 2.2 | Entrepreneurial orientation

EO is described as the processes and actions that lead to the introduction of new or existing products, and its salient dimensions are innovativeness, proactiveness and risk taking (Rauch et al., 2009). Innovativeness refers to creativity, predisposition to engage in new ideas, and experimentation through introduction of new products, processes, and/or technologies. Proactiveness refers to taking the initiative by anticipating and pursuing new opportunities ahead of the competition. Risk taking refers to taking bold actions and committing resources to new and risky ventures (Rauch et al., 2009). Entrepreneurship literature generally concurs that the above dimensions are the core dimensions associated with EO (Rauch et al., 2009).

### 2.3 | Internal lean practices

A lean manufacturing system is attributed as a set of best practices grouped together as a manufacturing system to obtain greater benefits than particular elements implemented independently (Yang, Hong, & Modi, 2011). These practices include pull-production systems, process variance reduction, quality management, and people involvement (Shah & Ward, 2003). Pull-production systems produce only what is required by customers (Sugimori, Kusunoki, Cho, & Uchikawa, 1977). Process variance reduction initiatives focus on machine and process set-up time reduction, which, together with total productive maintenance, are part of a comprehensive strategy to reduce variability and increase the efficient use of resources (Karlsson & Åhlström, 1996). Quality management aims to achieve zero defects through continuous process improvement (Womack & Jones, 1994). People involvement includes mainly human resources-related aspects such as problem solving, motivation, and teamwork (Martinez-Jurado & Moyano-Fuentes, 2014). This study focuses on the internal orientation of lean practices, and thus, we conceptualise ILPs as the implementation of manufacturing practices that reduce non-value-added activities from a firm's internal operations (Chavez et al., 2015).

### 2.4 | TBL and its multiple dimensions

A conceptualisation of sustainability takes into consideration the environmental, social, and economic performance (Elkington, 1998; Henry et al., 2019). While environmental performance refers to the use of resources and the environmental externalities associated with the use of those resources (Hall et al., 2010), social performance refers to aspects such as health, safety, and motivation in the workplace (Kaplan, Bradley, Luchman, & Haynes, 2009). Economic performance refers to factors that explain the sustained operational and financial performance of the firm, and operational performance has been described as a key contributor to economic performance (Gimenez et al., 2012; Martinez-Jurado & Moyano-Fuentes, 2014). This study centres on operational performance and the manufacturing plant as the unit of analysis, and thus, it focuses on testing TBL performance at an internal plant level.

## 3 | RESEARCH HYPOTHESES

### 3.1 | The EO–ILP link

Cross-disciplinary research at the intersection of entrepreneurship and OM has been neglected (Chavez, Yu, Jacobs, & Feng, 2017). However, there are numerous implicit links between entrepreneurship and OM, which is to be expected at the intersection of entrepreneurship and ILPs (Kickul, Griffiths, Jayaram, & Wagner, 2011). Because EO emerges from the entrepreneurial literature as a critical entrepreneurial competency, we argue that there are also important links between EO and ILPs, as explained in the following paragraphs.

It is increasingly argued that entrepreneurial behaviour provides a suitable environment for process transformation (Hall et al., 2010). Specifically, entrepreneurial innovativeness concerns the ability of the firm to adopt new ideas and processes and can be viewed as an important condition for ILPs, which requires process change and reorganisation of manufacturing resources (Hsu et al., 2014). Regarding entrepreneurial proactiveness, ILPs require change in organisations whereby they (and their employees) adapt to a culture of continuous improvement (Grove, Meredith, MacIntyre, Angelis, & Neailey, 2010), which is facilitated by essential entrepreneurial elements such as empowerment, commitment, leadership, and creativity (Angelis, Conti, & Overton, 2011; Bortolotti, Boscari, & Danese, 2015). Entrepreneurial risk taking implies facing permanently challenging problems without obvious solutions and the willingness to make mistakes to find those solutions (Rad, 2006), which is essential for ILPs and its focus on continuous improvement (Grove et al., 2010). In sum, EO can be seen as a key antecedent of ILPs, which is consistent with the first two distinct dimensions of ROT (Sirmon et al., 2011): EO can structure a portfolio of resources and bundle those resources to build ILP capabilities.

The above arguments suggest that an entrepreneurial posture is an important requirement for the initial and continuous implementation of ILPs. However, the relationship between EO and ILPs has been investigated mostly by exploratory studies (e.g. Giunipero, Denslow, & Eltantawy, 2005; Handfield et al., 2009; Tatikonda, Terjesen, Patel, & Parida, 2013). As an exception, Hsu et al. (2014) empirically tested and found a positive association between corporate entrepreneurship and operational core competency (i.e. process management); however, corporate entrepreneurship has been strongly associated with only innovativeness in the literature and, thus, disregards the other main dimensions such as proactiveness and risk taking, which make a firm entrepreneurial (Covin & Miles, 1999). Consistent with the ROT, we argue that EO (through innovativeness, proactiveness, and risk taking) provides these essential entrepreneurial elements for ILPs. Thus, on the basis of the above arguments, we offer the following hypothesis:

**H1.** *EO is positively associated with ILPs.*

### 3.2 | The ILP–TBL link

Regarding environmental performance, the primary focus of ILPs is the elimination and prevention of any factors that do not add value to the operation, which is compatible with environmental management systems that also focus on the elimination and prevention of waste at its point of origin (Cherrafi et al., 2016; Dües, Tan, & Lim, 2013; Lartey, Owusu Yirenkyi, Adomako, & Danso, 2019; Lee & Klassen, 2016). Empirical evidence shows that ILPs constitute an important foundation for environmental training, recycling, development of products with less environmental impact and supplier selection base on environmental criteria (e.g. King & Lenox, 2001; Yang et al., 2011; Khuntia, Saldanha, Mithas, & Sambamurthy, 2018). However, the literature offers some contrary results (Dües et al., 2013; Vinodh, Arvind, & Somanaatham, 2011). For instance, in some cases, ILPs were found to result in higher pollution (Hajmohammad, Vachon, Klassen, & Gavronski, 2013; Rothemberg, Frits, & Maxwell, 2001).

The literature has also brought to light the importance of ILPs for social performance (Cherrafi et al., 2016). Factors such as motivation, problem solving, and teamwork lie at the centre of ILPs and have been regarded as ‘work energisers’ of the lean philosophy (Genaidy & Karowski, 2003). However, empirical investigation of the relationship between ILPs and social performance has provided contrasting results (Camuffo et al., 2017). On the one hand, ILPs can be associated with reduced stress levels (Conti, Angelis, Cooper, Faragher, & Gill, 2006) and motivation improvement (Camuffo et al., 2017; Wong & Wong, 2014); on the other hand, it may actually be negatively associated with social outcomes such as poor safety and health (Brown & O'Rourke, 2007; Camuffo et al., 2017; Longoni, Pagell, Johnston, & Veltri, 2013), reduced worker creativity, increased worker isolation, stress, and poor working conditions (Mehri, 2006). Despite this, ILPs are not inherently stressful and do not aim at reducing employees' well-being (Sugimori et al., 1977). Rather, negative social and health outcomes are associated with the incompatibility of management styles with necessary health standards (Anderson-Connolly, Grunberg, Greenberg, & Moore, 2002; Conti et al., 2006). Further, it has been suggested that the positive effect of lean systems on social performance depends on how lean practices are applied and combined (Camuffo et al., 2017). Thus, 'work energisers' need to be combined with potentially harmful lean manufacturing techniques to counteract the negative effects.

Various studies have addressed the impact of ILPs on operational performance (Negrão et al., 2017), which is mostly defined in terms of quality, delivery, flexibility, and cost (Shah & Ward, 2003). The main objective of ILPs is to increase productivity through waste reduction, and thus, cost reduction is an advantage associated with lean (Cua, McKone, & Schroeder, 2001). Continuous improvement and identification of root causes of waste intrinsically improve the quality of manufacturing operations (Shah & Ward, 2003) and contribute to shorter delivery times (Cua et al., 2001). Finally, certain types of flexibility, such as fast process changeover and machine set-up time, can be improved (Chavez et al., 2015).

The above literature provides evidence of a positive association between ILPs and operational performance; however, there are still inconsistencies in the effects of ILPs on environmental and social performance, which may be explained by studies concentrating on individual or few dimensions of TBL performance (Seuring & Muller, 2008; Wu et al., 2015). The literature suggests that the three TBL dimensions should be addressed simultaneously because an integrated TBL framework can better direct operations towards becoming sustainable (Cherrafi et al., 2016; Glavas & Mish, 2015). A few exploratory studies have investigated the relationship between ILPs and the three dimensions of TBL performance (e.g. Bergenwall, Chen, & White, 2012; Wang, Subramanian, Gunasekaran, Abdulrahman, & Liu, 2015; Wu et al., 2015). Other exploratory studies have investigated the relationship between ILPs and some combinations of TBL dimensions such as social and economic (e.g. Longoni et al., 2013) or social and environmental (e.g. Longoni & Cagliano, 2015). Recently, Huo, Gu, and Wang (2019) found mixed support for the association between the external perspective of lean and all TBL performance dimensions; however, the internal perspective of lean remains underexplored. Dey, Malesios, De, Chowdhury, and Ben Abdelaziz (2019) found support for the positive association between lean practices and sustainable performance; however, they could not differentiate between internal and external lean practices and did not include lean human resources-related aspects, which have been regarded as the 'glue' that makes lean practices stick together (Martinez-Jurado & Moyano-Fuentes, 2014). Accordingly, it seems pertinent to consider the relationship between ILPs and all TBL performance dimensions.

**H2.** *ILPs are positively associated with (a) environmental performance, (b) social performance, and (c) operational performance.*

### 3.3 | ILP mediates the EO–TBL link

The arguments and research evidence presented above for the positive association between EO and ILPs and between ILPs and TBL performance implicitly suggest that ILPs may act as a mediating variable. Thus, ILPs may not only need EO traits for its implementation, but EO may also need ILP capabilities to turn innovative ideas into sustainable products.

It has been suggested that transforming the way society uses natural resources and improves social conditions is possible through entrepreneurship (Courrent et al., 2018), which can develop businesses in ways consistent with TBL (Hall et al., 2010). Entrepreneurship literature has highlighted the importance of the entrepreneurial posture for operational (Covin, Slevin, & Heeley, 2000), environmental (Pacheco, Dean, & Payne, 2010), and social performance (Shepherd & Patzelt, 2011). However, the literature suggests a bias towards a positive association between EO and firm performance (Anderson & Eshima, 2013), and the assumption of EO as universally beneficial has been challenged by empirical evidence (Wiklund & Shepherd, 2005). For instance, Jansson, Nilsson, Modig, and Hed Vall (2017) could not find a positive effect of innovativeness and risk taking on sustainability commitment (i.e. competitiveness); only proactiveness was associated with sustainability commitment. This inconsistency in the results may be explained given the performance variance associated with EO, because innovative and risky projects generate naturally uncertain performance outcomes (Wales et al., 2013). This is more evident in projects and activities that target sustainable development because they require new products, processes, technologies, and, often, the creation of new markets that value sustainable solutions (Dean & McMullen, 2007; Glavas & Mish, 2015). Thus, understanding the factors that support entrepreneurial organisations to manage their TBL performance is important. This suggests the presence of a mechanism through which EO affects performance (Courrent et al., 2018). Because exploration of these mechanisms is largely neglected in the literature, recent entrepreneurial research has called for research that explores mediating effects in the EO–outcome link (Wales, 2016). In response to this call, a recent study by Karami and Tang (2019) has empirically tested the mediating effect of external networking capability on the EO–performance link; however, the internal manufacturing capability perspective, such as ILPs, remains underexplored in the literature.

The ROT provides the theoretical underpinning for understanding the interplay between EO, ILPs, and TBL. ROT suggests that EO can lead, encourage, and facilitate the development/modification of organisational structures, deployment of processes and routines, and the acquisition of knowledge resources on which key capabilities are often built (Chavez et al., 2017; Rosenbusch et al., 2013). However, helping to identify necessary resources or facilitating their use or creation may not be enough to materialise TBL performance; EO requires an operational mechanism running effectively. Specifically, it has been suggested that EO is often unsuccessful owing to the lack of resources and the leverage of those resources that help to translate EO into performance (Su, Xie, & Wang, 2015). Resources in entrepreneurial organisations are often limited. Thus, the effect of EO on performance is through effective management of organisation operations routines and better utilisation of resources (Covin & Slevin, 1989) such as lean management. Integrating and coordinating mechanisms help leveraging and bundling resources, which can ultimately be associated with competitive advantage (Wong, Wong, & Boon-itt, 2018). Recent studies have investigated the mediating role of environmental sustainability orientation on the EO–firm performance link (e.g. Amankwah-Amoah, Danso, & Adomako, 2018; Roxas, Ashill, & Chadee, 2017); however, an orientation provides a vision, which is not the same as the operational capability to transform the vision into sustainable goals. Thus, while EO provides the essential and mobilising attitude to identify and use resources, a participative strategy and coordination mechanism is required to leverage those entrepreneurial resources (Chirico et al., 2011). From a manufacturing perspective, we seek to argue that ILPs can be a resource-orchestrating mechanism because they promote high coordination and synchronisation of tasks and prevent disruption in the transformation process (Shah & Ward, 2003). This interpretation is consistent with the third distinct dimension of ROT: leveraging capabilities (Sirmon et al. 2011). In other words, because ILPs can transform entrepreneurial action into efficient and inclusive manufacturing actions, it can act as an intervening mechanism between EO and TBL performance. Complementing the above literature, we explore the possible mediation effect of ILPs on the relationship between EO and TBL performance through a ROT perspective. Thus, we hypothesise the following:

**H3.** *ILPs mediate the relationships between EO and (a) environmental performance, (b) social performance, and (c) operational performance.*

## 4 | RESEARCH METHOD

### 4.1 | Sample and data collection

The data for this study were gathered from Chile's manufacturing industry. A random sample of 1,000 manufacturing firms was drawn from Chile Enterprises Directory, one of Chile's most reliable databases on company and industrial activities.

A single respondent per plant was considered appropriate because of mixed-sized firms in the sampling frame, because, in some firms, multiple respondents were not available (Rindfleisch, Malter, Ganesan, & Moorman, 2008). As an ex ante approach to reduce single-respondent bias, we reviewed the profiles of potential respondents to ensure that they were capable of providing the required information (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Individuals holding upper-management roles such as plant managers were chosen as key informants, because they are assumed to have a broad range of knowledge and access to relevant information (Montabon, Daugherty, & Chen, 2018). The ability of a manager to abstract from a situation and provide unbiased view reduces common-method bias (Krause, Luzzini, & Lawson, 2018). These conscious efforts, constrained by the research context, may not eliminate common-method bias but also focus towards reducing it to a pragmatic level (Flynn, Pagell, & Fugate, 2018).

As an incentive, a benchmark score of each company's practices and performance relative to their industry sector was offered. A total of 120 questionnaires were received, of which 112 were usable. This yielded a final response rate of 12%, thus providing a reasonable sample size (Hair, Hult, Ringle, & Sarstedt, 2016). Table 1 shows the demographic characteristics of respondents and companies.

The main reasons for focusing on Chile are threefold. First, it is an entrepreneurial ecosystem with one of the highest levels of economic development in Latin America (Espinoza, Mardones, Saes, & Catalan, 2019). Second, Chile has been considered a representative example of the state of manufacturing among other newly industrialising countries in the region (Husseini & O'Brien, 2004).

**TABLE 1** Demographic characteristic of respondents

| | Number | Percentage |
|---|---|---|
| Industries (continuous process) | | |
| Food and beverage (low) | 26 | 23.2 |
| Textiles and apparel (low) | 14 | 12.5 |
| Fabricated metal products (low) | 13 | 11.6 |
| Plastics (high) | 12 | 10.8 |
| Woods/products of wood (low) | 12 | 10.8 |
| Chemicals (high) | 11 | 9.8 |
| Pulp, paper and paper products (high) | 10 | 8.9 |
| Pharmaceuticals (low) | 9 | 8.0 |
| Glass (high) | 5 | 4.4 |
| Respondent | | |
| Plant manager | 13 | 11.6 |
| General manager | 33 | 29.4 |
| Operations manager | 30 | 26.8 |
| Production manager | 19 | 17.0 |
| Production line manager | 8 | 7.1 |
| Logistics/distribution manager | 6 | 5.4 |
| Purchasing manager | 3 | 2.7 |
| Number of employees | | |
| 0–50 | 30 | 26.8 |
| 51–150 | 30 | 26.8 |
| 151–500 | 25 | 22.3 |
| >500 | 27 | 24.1 |

*Note*: The total number for each classification is 112.

Third, the promise of more sustainable development has been constantly overshadowed by a weakened civil society, policies, and institutions that are averse to sustainable transformations, fragile commitment by corporate governments, and a progressive increase in extractive costs in natural resources (Carruthers, 2001). For instance, in social terms, Chile's economic development is inhibited by being one of the most unequal countries in the world (López & Miller, 2008). Recent social unrest suggests that inequality is becoming worse in Chile, which calls for urgent economic and social reforms (BBC, 2019). For these reasons, we believe Chile provides an interesting case study from an entrepreneurial, manufacturing, and sustainability perspective.

### 4.2 | Questionnaire design and measures

Several approaches recommended in the literature were adopted to improve content validity (O'Leary-Kelly & Vokurka, 1998). First, a comprehensive literature review was performed to ascertain the content validity of the measurement scales. The questionnaire was also sent to academics to provide feedback. Second, following the work of Brislin (1970), the initial version of the questionnaire was first developed in English and then translated into Spanish, and then a back-translated English version was checked to ensure conceptual equivalence. Third, the questionnaire was tested with a master of business administration (MBA) class and through five semistructured interviews with top senior operations managers of our sample of firms. These senior executives were carefully chosen to ground our research (i.e. the constructs and relationships proposed) and provide appropriate focus for survey design (Montabon et al., 2018). Fourth, the modified version of the questionnaire was pilot tested with five companies of our sample. Terminology was again adapted and changed to better suit our target population in Chile.

### 4.3 | Measures and control variable

We used an individual dimension of EO characterised by innovativeness, proactiveness, and risk taking (Covin & Slevin, 1989). The Covin and Slevin (1989) scale included one item (our company typically adopts a very competitive 'undo-the-competitors' posture) measuring *competitive aggressiveness* rather than proactiveness. Following Stam and Elfring (2008), we replaced this item with a question emphasising proactiveness over the competition on introducing new ideas or products. Furthermore, EO was measured at a firm level (Lumpkin & Dess, 1996). ILPs were measured with a six-item scale derived from Shah and Ward (2007) and Azadegan, Patel, Zangoueinezhad, and Lindernman (2013). The scale included questions on shop-floor employees leading to continuous improvement, techniques for variability reduction, and pull-production systems. For the above scale items, a 7-point Likert scale (ranging from 1 = *strongly disagree* to 7 = *strongly agree*) was used, by which respondents were asked to evaluate their businesses in terms of their agreement with the posited statements.

Environmental performance was measured with scales developed by Zhu and Sarkis (2004), including six questions on the efficient use of resources and reduction of pollution. Social performance was measured by scales based on the work of Berg, Applebaum, Bailey, and Kallegerg (1996), Nikolaou, Evangelinos, and Allan (2013), and Bai and Sarkis (2010), including four items on job satisfaction. Operational performance was measured with an eight-item scale based on Chavez et al. (2015), including questions on internal operational performance measures addressing quality, delivery, flexibility, and cost. For the performance variables, a 7-point Likert scale (ranging from 1 = *poor or low end of the industry* and 7 = *superior*) was used, and respondents were asked to evaluate how their firms compared with their direct competitors.

Firm size and industry type were used as control variables in our conceptual model. We controlled for firm size using the number of employees as a proxy because firms that are too small may have less resources for implementing ILPs (Shah & Ward, 2003) and sustainable operations (Wu et al., 2015). We classified industry type as a dichotomous variable identifying a firm with one of the two comparative categories: low (1) versus high (0) continuous process sectors. It has been argued that the benefits obtained from lean systems are less visible in continuous and capital-intensive process sectors characterised by large machinery, long set-up times, and the overall difficulty to stop production and produce relatively small batches (Abdulmalek & Rajgopal, 2007). Continuous process industries are often associated with chemicals, electricity, steel, paper, and plastics, among others (Slack, Chambers, Johnston, & Betts, 2009).

### 4.4 | Nonresponse bias and common-method bias

The approach of Armstrong and Overton (1977) was used to test for nonresponse bias. Ten randomly selected items of 25 early and 25 late respondents were not statistically different according to *T*-tests, providing evidence for absence of significant nonresponse bias. In addition, the number of employees, an indicator of firm size, was not significantly different between early and late respondent companies according to *T*-test. This provides further support for the absence of nonresponse bias. Descriptive statistics for this study are shown in Table 2.

Because the data were collected from one respondent for each factory, common-method bias may present an issue. Thus, the authors conducted an ex post analysis to test for common-method bias in the data. The single common factor analysis of all items showed that only 36.56% variance, which is less than the upper acceptable limit 50%, was explained by a single component factor, confirming that common-method bias is not a significant issue in this research (Podsakoff et al., 2003). In addition, a significant increase ($p < 0.001$) in the value of chi-squared ($\chi^2_{336\ df} = 498.291$ to $\chi^2_{346\ df} = 1{,}080.886$) when comparing a single-factor model with one in which items were loaded onto their respective constructs provided

**TABLE 2** Descriptive statistics of the items

| Constructs | Items | Mean | SD |
|---|---|---|---|
| Entrepreneurial orientation<br>Source: Covin and Slevin (1989), Stam and Elfring (2008) | Our company favours a strong emphasis on R&D, technological leadership, and innovations | 5.34 | 1.462 |
| | Many new lines of products were marketed in the past 3 years | 5.41 | 1.680 |
| | Changes in product lines have usually been quite dramatic | 5.14 | 1.388 |
| | Typically, we initiate actions to which competitors then respond | 5.03 | 1.641 |
| | We are very often the first business to introduce new products, administrative techniques, processing technologies, etc. | 4.79 | 1.539 |
| | Our company has a strong tendency to be ahead of others in introducing novel ideas or products | 5.07 | 1.511 |
| | In general, the top managers of the firm have a strong proclivity for high-risk projects | 4.37 | 1.565 |
| Internal lean practices<br>Source: Azadegan et al. (2013) | Shop-floor employees lead product/process improvement efforts | 5.23 | 1.375 |
| | We maintain all our equipment regularly | 5.58 | 1.522 |
| | We use extensive use of statistical techniques to reduce process variance | 5.44 | 1.463 |
| | We have low set-up times of equipment in our plant | 5.83 | 1.122 |
| | We use a pull-production system | 4.79 | 1.846 |
| | Equipment is grouped to produce a continuous flow of families of products | 5.68 | 1.195 |
| Environmental performance<br>Source: Zhu and Sarkis (2004) | Reduction of air emission | 4.88 | 1.575 |
| | Reduction of wastewater | 5.04 | 1.420 |
| | Reduction of solid wastes | 5.38 | 1.459 |
| | Decrease of consumption for hazardous/harmful/toxic materials | 5.47 | 1.427 |
| | Decrease of frequency for environmental accidents | 5.63 | 1.350 |
| | Improve an enterprise's environmental situation | 5.26 | 1.354 |
| Social performance<br>Source: Berg et al. (1996), Bai and Sarkis (2010), Nikolaou et al. (2013) | In general, our employees are satisfied with their job | 4.96 | 1.170 |
| | The amount of stress at work has decreased over the last 3 years | 5.07 | 1.320 |
| | Health and safety incidents have decreased over the last 3 years | 5.58 | 1.299 |
| | Injuries and lost days related to injuries have decreased over the last 3 years | 5.63 | 1.287 |
| Operational performance<br>Source: Chavez et al. (2015) | Production cost | 5.12 | 1.307 |
| | Labour productivity | 5.15 | 1.224 |
| | High product performance | 5.85 | 1.042 |
| | Ease (cost and time) to service product (well-designed product for an effective service) | 5.55 | 1.114 |
| | Ability to introduce new products into production quickly | 5.31 | 1.252 |
| | Ability to adjust capacity rapidly within a short time period | 5.13 | 1.402 |
| | Delivery on due date (ship on time) | 5.47 | 1.098 |
| | Reducing production lead time (order entry to shipment) | 5.31 | 1.238 |

Abbreviation: R&D, research and development.

**TABLE 3** Measurement model results

| Constructs | Items | Factorial weight | *T*-statistic |
|---|---|---|---|
| Entrepreneurial orientation (Cronbach's $\alpha$ = 0.928, composite reliability = 0.927, AVE = 0.647, CFI = 0.987) | Our company favours a strong emphasis on R&D, technological leadership, and innovations | 0.867 | 9.379 |
| | Many new lines of products were marketed in the past 3 years | 0.778 | 8.282 |
| | Changes in product lines have usually been quite dramatic | 0.855 | 9.226 |
| | Typically, we initiate actions to which competitors then respond | 0.745 | 9.226 |
| | We are very often the first business to introduce new products, administrative techniques, processing technologies, etc. | 0.793 | 8.465 |
| | Our company has a strong tendency to be ahead of others in introducing novel ideas or products | 0.848 | 9.132 |
| | In general, the top managers of the firm have a strong proclivity for high-risk projects | 0.734 | 7.807 |
| Internal lean practices (Cronbach's $\alpha$ = 0.778, composite reliability = 0.782, AVE = 0.474, CFI = 0.997) | Shop-floor employees lead product/process improvement efforts | 0.688 | 6.486 |
| | We maintain all our equipment regularly | x | |
| | We use extensive use of statistical techniques to reduce process variance | 0.734 | 6.483 |
| | We have low set-up times of equipment in our plant | 0.675 | 6.358 |
| | We use a pull-production system | x | |
| | Equipment is grouped to produce a continuous flow of families of products | 0.653 | 6.172 |
| Environmental performance (Cronbach's $\alpha$ = 0.906, composite reliability = 0.909, AVE = 0.626, CFI = 1.000) | Reduction of air emission | 0.692 | 8.807 |
| | Reduction of wastewater | 0.76 | 10.298 |
| | Reduction of solid wastes | 0.913 | 8.807 |
| | Decrease of consumption for hazardous/harmful/toxic materials | 0.828 | 12.093 |
| | Decrease of frequency for environmental accidents | 0.799 | 11.294 |
| | Improve an enterprise's environmental situation | 0.736 | 9.742 |
| Social performance (Cronbach's $\alpha$ = 0.831, composite reliability = 0.855, AVE = 0.600, CFI = 0.954) | In general, our employees are satisfied with their job | 0.864 | 9.732 |
| | The amount of stress at work has decreased over the last 3 years | 0.815 | 9.732 |
| | Health and safety incidents have decreased over the last 3 years | 0.783 | 7.408 |
| | Injuries and lost days related to injuries have decreased over the last 3 years | 0.613 | 6.853 |
| Operational performance (Cronbach's $\alpha$ = 0.884, composite reliability = 0.882, AVE = 0.518, CFI = 0.978) | Production cost | x | |
| | Labour productivity | 0.706 | 7.368 |
| | High product performance | 0.681 | 7.09 |
| | Ease (cost and time) to service product (well-designed product for an effective service) | 0.634 | 6.567 |
| | Ability to introduce new products into production quickly | 0.753 | 6.567 |
| | Ability to adjust capacity rapidly within a short time period | 0.628 | 8.426 |
| | Delivery on due date (ship on time) | 0.791 | 8.338 |
| | Reducing production lead time (order entry to shipment) | 0.822 | 8.692 |

*Note*: All factorial weights are significant at $p$ = 0.001. × Removed for low (less than 0.60) factorial weight.
Abbreviation: AVE, average variance extracted; CFI, comparative fit index; R&D, research and development.

further evidence of the insignificant presence of common-method bias.

## 5 | DATA ANALYSIS AND RESULTS

### 5.1 | Measurement model

A two-step structural equation modelling (SEM) using AMOS 22 modelling software was adopted (Byrne, 2013). An assessment of convergent validities, discriminant validities, and reliabilities of EO, ILPs, environmental performance, social performance, and operational performance was carried out using confirmatory factor analysis (CFA). The model fit indices ($\chi^2$ $_{336\ df}$ = 498.221, $\chi^2$/df = 1.483, comparative fit index [CFI] = 0.918, Tucker–Lewis index [TLI] = 0.908, incremental fit index [IFI] = 0.920, root mean square error of approximation [RMSEA] = 0.066) suggest that the data fit the CFA model (Hu & Bentler, 1999; Hair et al., 2016). In the process, three items were dropped because of low factorial loadings (see Table 3). The retained items are all above 0.60 and significant ($p$ < 0.01), thus satisfying the individual item reliabilities (Nunnally & Bernstein, 1994).

All values of Cronbach's $\alpha$ and composite reliability are greater than 0.70, thus satisfying the construct's internal consistency and reliability (Nunnally & Bernstein, 1994; Hair et al., 2016). Internal consistency measured through Cronbach's $\alpha$ seeks to assess whether different items used to measure a construct produce similar results. Composite reliability refers to the extent to which measurement items of a construct share in their measurement of the construct. The values of average variance extracted (AVE) of all constructs, except ILPs, are greater than 0.50, thus satisfying the convergent validity requirements. However, as shown in Table 3, the AVE value of ILP, that is, 0.474, seems acceptable because of strong coefficients (>0.60), the significance of individual items ($p$ < 0.01), and the composite reliability of the construct (>0.70) (Fornell & Larcker, 1981). Convergent validity indicates that all items in the construct measure the same construct (Bagozzi & Yi, 1991).

Discriminant validity seeks to measure the extent of a construct's uniqueness by showing that two measures that are not supposed to be related are unrelated in the data. Discriminant validity can be tested by comparing the AVE value of a construct with shared variance of the construct with all other constructs in pairs. Squared inter-construct correlation values between all pairs of constructs were less than the individual construct's AVE values in the pair, thus providing evidence for satisfactory discriminant validities of the constructs (Hair, Black, Babin, & Anderson, 2010). To further test the discriminant validity, we compared the fit in terms of $\chi^2$ of a one-factor model with that of a two-factor model for every possible pair of constructs. Significant increase ($p$ < 0.01) in $\chi^2$ value in two-factor model compared with one-factor model in each pair of constructs suggested a satisfactory discriminant validity of all constructs. Finally, the correlation coefficients between the constructs were lower than the reliability coefficients, suggesting that the constructs have satisfactory discriminant validity (Crocker & Algina, 1986).

The uni-dimensionality of a construct refers to the extent to which measurement items of a construct measure the same construct. All constructs had values of CFI in excess of 0.90 in a single-factor CFA model of each construct, thus satisfying uni-dimensionality requirements (Hu & Bentler, 1999).

### 5.2 | Estimation of structural model

SEM with maximum likelihood estimation method was applied to test the hypothesised direct relationships. The goodness of fit indices of the hypothesised model, including the control variable firm size and industry, provided a reasonable model fit ($\chi^2$ $_{386\ df}$ = 583.512, $\chi^2$/df = 1.512, CFI = 0.902, TLI = 0.889, IFI = 0.904, RMSEA = 0.068). The correlation values of all variables are shown in Table 4.

**TABLE 5** Results of hypotheses $H_{1a}$, $H_{2a}$, $H_{2b}$, and $H_{2c}$

| Hypothesis | Standardised coefficient | *T*-value |
|---|---|---|
| $H_{1a}$: Entrepreneurial orientation → Internal lean practices | 0.650*** | 5.397 |
| $H_{2a}$: Internal lean practices → Environmental performance | 0.652*** | 4.956 |
| $H_{2b}$: Internal lean practices → Social performance | 0.782*** | 6.160 |
| $H_{2c}$: Internal lean practices → Operational performance | 0.739*** | 4.798 |

***$p$ value < 0.001.

**TABLE 4** Correlation values

| | Industry | Firm size | EO | ILP | OP | SP |
|---|---|---|---|---|---|---|
| Firm size | 0.101 | | | | | |
| EO | 0.137 | 0.107 | | | | |
| ILP | 0.078 | 0.061 | 0.567 | | | |
| OP | 0.029 | −0.033 | 0.64 | 0.657 | | |
| SP | 0.144 | 0.18 | 0.612 | 0.742 | 0.549 | |
| EP | 0.111 | 0.237 | 0.322 | 0.712 | 0.412 | 0.531 |

Abbreviations: EO, entrepreneurial orientation; EP, environmental performance; ILP, internal lean practices; OP, operational performance; SP, social performance.

The results in Table 5 show the path estimates of the structural model for the direct hypotheses $H_1$, $H_{2a}$, $H_{2b}$, and $H_{2c}$. EO is positively associated with ILPs ($p < 0.001$), thus supporting $H_1$. Similarly, ILPs have a positive impact on environmental, social, and operational performance (all at $p < 0.001$), thus supporting $H_{2a}$, $H_{2b}$, and $H_{2c}$. The control variable firm size was found positively associated with environmental performance ($\beta = 0.189$, $p < 0.05$). However, all other associations of control variables were insignificant.

### 5.3 | Mediation test

The bootstrapping approach of Preacher and Hayes (2008) was used to test for the mediation effect of ILPs. The bootstrapping approach has a higher statistical power, can accommodate multiple mediation hypotheses in a model, and is more robust in assumptions of normality (Rungtusanatham, Miller, & Boyer, 2014). Thus, we used bias-corrected bootstrapping approach that generated 5,000 resamples to empirically estimate the indirect effects and their significance. According to the decision tree proposed by Zhao, Lynch, and Chen (2010), estimates of direct and indirect effects between independent and dependent variables provided the needed information to understand the presence of a mediation factor. The results of the mediation analysis using estimates of direct and indirect paths are presented in Table 6.

The results of the bootstrapping analysis show that the indirect effects of EO on environmental performance ($p < 0.001$), social performance ($p < 0.001$), and operational performance ($p < 0.05$) are positive and significant. In addition, the direct effects of EO on environmental performance and social performance are not significant ($p > 0.05$). This suggests that the mediation effect of ILPs in the relationship between (a) EO and environmental performance and (b) EO and social performance is indirect only, thus fully supporting $H_{3a}$ and $H_{3b}$. However, the direct effect of EO on operational performance is significant ($p < 0.05$). This suggests that the mediation effects of ILPs in the relationship between EO and operational performance are complementary, thus providing partial support to $H_{3c}$. Complementary mediation provides support to the presence of hypothesised mediator but indicates the possibility of an omitted mediator in the direct path (Zhao et al., 2010).

## 6 | DISCUSSION

### 6.1 | Theoretical implications

This study has addressed the need for cross-disciplinary research at the intersection of entrepreneurship and OM (Chavez et al., 2017; Hsu et al., 2014; Kickul et al., 2011). Specifically, the results strongly support the role of EO as a key precursor of ILPs. To pursue business opportunities (e.g. cost superiority), EO can stimulate the development of matching capabilities such as ILPs (Covin et al., 2000; Rosenbusch et al., 2013). Furthermore, EO can act as a key enabler for the implementation of ILPs, which requires culture and leadership styles characterised by entrepreneurial traits (Angelis et al., 2011). This result lends credence to and extends prior work suggesting that EO can foster manufacturing capability (e.g. Giunipero et al., 2005; Handfield et al., 2009; Hsu et al., 2014; Tatikonda et al., 2013). This is consistent with the ROT, as EO, through innovativeness, proactiveness, and risk taking, can play the main role in facilitating the development of manufacturing capabilities such as ILPs.

Our results have also highlighted the important role of ILPs as an enabler of TBL performance. Most studies suggesting that ILPs enable all TBL performance dimensions are exploratory (e.g. Bergenwall et al., 2012; Longoni et al., 2013; Longoni & Cagliano, 2015; Wang et al., 2015; Wu et al., 2015) or did not consider important lean human-related factors (e.g. Dey et al., 2019). Thus, our findings extend the existing literature.

First, regarding environmental performance, our finding corroborates important commonalities and synergistic relationship between both the lean and environmental paradigms (Martinez-Jurado & Moyano-Fuentes, 2014; Lee & Klassen, 2016; Cherrafi et al., 2016; Lartey et al., 2019). Our ILPs construct lies within the overlap of the lean and environmental paradigms (i.e. waste reduction techniques, people, and organisation and lead time reduction) (Dües et al., 2013). Specifically, our results support the view that manufacturing techniques targeting the efficient use of resources and employee involvement techniques have a positive effect on environmental performance.

Second, previous research queried whether lean is actually ‘mean’ (Anderson-Connolly et al., 2002); our findings show that ILPs positively affect social performance (Longoni et al., 2013). It is important to mention that our ILPs construct considered human resource

**TABLE 6** Bootstrapping results for mediation relationship tests

| Hypothesis | IV | MV | DV | Effect of IV on MV (*a*) | Effect of MV on DV (*b*) | Direct effect (*c′*) | Indirect effect of IV on DV | SE of indirect effects | 95% CI for mean indirect effect |
|---|---|---|---|---|---|---|---|---|---|
| $H_{3a}$ | EO | ILP | EP | 0.567*** | 0.779*** | −0.148 | 0.442*** | 0.148 | 0.237–0.832 |
| $H_{3b}$ | EO | ILP | SP | 0.567*** | 0.583** | 0.262 | 0.330*** | 0.133 | 0.136–0.668 |
| $H_{3c}$ | EO | ILP | OP | 0.567*** | 0.433* | 0.412* | 0.246* | 0.126 | 0.048–0.534 |

*Note*: Standardised effects.
Abbreviations: CI, confidence interval; DV, dependent variable; EO, entrepreneurial orientation; EP, environmental performance; ILP, internal lean practices; IV, independent variable; MV, mediating variable; OP, operational performance; SE, standard error; SP, social performance.
*$p$ value < 0.05. **$p$ value < 0.01. ***$p$ value < 0.001.

management (HRM) factors, which can counteract the potentially harmful effects of some lean manufacturing techniques (Wu et al., 2015). Indeed, decomposing the workplace has shown that task repetition can produce detrimental health consequences, whereas aspects such as autonomy can be beneficial for the overall health and motivation of employees (Anderson-Connolly et al., 2002). Our results support the view that worker involvement and participation can potentially increase the benefits of ILPs for the employees' well-being in lean factories (Camuffo et al., 2017).

Third, our results support the broad recognition of the positive relationship between ILPs and operational performance (Negrão et al., 2017) through an integrated construct that includes cost, quality, delivery, and flexibility. Our work supports the argument that ILPs, as a whole, can excel through multiple operational performance dimensions (Chavez et al., 2015).

In addition to the above findings, a novel contribution of this study is the full mediation effect of ILPs on the relationships between EO and environmental performance, and EO and social performance. This responds to recent calls for better understanding of how EO affects performance (Wales, 2016), specifically TBL performance, and extends previous work that found mixed support for the EO–sustainable performance link (e.g. Jansson et al., 2017) or work that combined EO, environmental sustainability orientation, and firm performance (e.g. Amankwah-Amoah et al., 2018; Roxas et al., 2017). Further, our results respond to explaining how TBL performance is achieved in entrepreneurial organisations, which is an area that remains underdeveloped (Glavas & Mish, 2015). Our results suggest that ILPs is a means by which EO is translated into environmental and social performance improvement. EO alone is incomplete to materialise environmental and social performance, which is consistent with the work of Tang, Tang, Marino, Zhang, and Li (2008), who found that the EO–performance link was an inverted U-shape in developing countries. In certain contexts (e.g. resource-constrained firms), high EO could be more harmful than beneficial (Wales, 2016), and efficient manufacturing capabilities can be required to improve performance. Consistent with ROT, our model suggests that EO can lead to acquiring, changing, or creating crucial resources for efficient and people-oriented manufacturing practices such as ILPs (Covin et al., 2000; Rosenbusch et al., 2013). ILPs in turn orchestrate the reduction of excess and a more efficient use of resources, which are compatible with environmental initiatives and performance. Similarly, when lean incorporates appropriate inclusive factors such as the encouragement of a more proactive behaviour in employees (e.g. participation) (Conti et al., 2006), a more balanced ILPs approach could be stimulated towards social performance. Our findings suggest that EO can encourage the implementation of ILPs, which in itself is instrumental in environmental and social performance improvement.

Another significant contribution of this research is the evidence of a partial mediation effect of ILPs on the relationships between EO and operational performance. It can be inferred from this finding that an entrepreneurial posture could greatly complement ILPs, and thus, EO should accompany ILPs for operational performance improvement. Although our results showed that ILPs can affect multiple operational performance dimensions, some aspects such as flexibility are not typically a strength associated with ILPs. Thus, innovative and bold actions attributed to EO could be critical in order to compensate for the potential weaknesses associated with ILPs (Conti et al., 2006). For instance, in some contexts, hybrid manufacturing such as 'leagile' (combination of lean and agile) has been found to be more appropriate to compete (Mason-Jones, Naylor, & Towill, 2000). The implementation of such systems requires EO (i.e. an innovative, risk taking, and proactive posture). This argument can be exemplified by Toyota, which is lean yet flexible and introduces cars fast to the market because their EO has been able to manage the conflicts between innovativeness and lean manufacturing (Takeuchi, Osono, & Shimizu, 2008).

## 6.2 | Managerial implications

Our research has demonstrated that EO constitutes a significant conduit for efficient manufacturing techniques such as ILPs. Furthermore, implementing ILPs and achieving the required levels of employee involvement and organisational commitment are not simple tasks. ILPs require a substantial transformation of employee behaviour (Bortolotti et al., 2015). Thus, managers who plan to implement ILPs should also be aware of relevance and value of EO (i.e. innovativeness, proactiveness, and risk taking) as an important enabler for ILPs implementation. If ILPs are already in place, managers could encourage a climate of entrepreneurship in their manufacturing plants and entrepreneurial ideas in their workers to extract the full benefits of lean.

Our results have also highlighted the relationship between ILPs and TBL performance. Despite the notion that ILPs can be more associated with certain TBL dimensions, our findings show that ILPs can, in fact, benefit all TBL performance dimensions. However, when organisations want to pursue multiple operational performance dimensions, ILPs can be greatly complemented by EO. A proactive management style characterised by an entrepreneurial posture can complement lean management to maximise its operational benefits, whereas if environmental and social performances are chosen to compete, EO alone may not be enough. Instead, ILPs by themselves could generate environmental and social performance superiority. It is important to mention that ILPs should combine manufacturing practices that target both the efficient use of resources and HRM, which explains the synergistic relationship between ILPs and environmental and social performance.

The context of this study is the manufacturing industry in Chile, which faces fierce competition because the trend for manufacturing firms is to increasingly engage with foreign markets (Espinoza et al., 2019). Studies on Chilean manufacturers have specifically highlighted high manufacturing productivity in the region; however, much of this benefit has not brought a positive change in environmental and social variables (Carruthers, 2001). Thus, our study has provided a path for entrepreneurial manufacturing companies that target TBL performance in emerging economies. Our findings provide insight for the design of public and corporate policies that focus on sustainable development.

## 7 | CONCLUSIONS

This study offers further insight into the interface of entrepreneurship and manufacturing operations, suggesting important complementarities between both fields. Moreover, it highlights the strong role of EO and ILPs in TBL performance. However, our research implies that the effect of EO and ILPs on TBL performance varies according to TBL environmental, social, and operational dimensions. Furthermore, our study supports the ROT by explaining how ILPs can act as a resource-orchestrating operational capability to increase the impact of EO on TBL performance. These contributions respond to recent research calls highlighting the need for implementation-focused capabilities that translate entrepreneurial drive into performance given the performance variance associated with EO (Wales, 2016).

Despite these contributions, our study has certain limitations. Although strong support was found for most of the hypothesised relationships among EO, ILPs, and TBL performance, it should be noted that the phenomena are potentially longitudinal in nature. To overcome the cross-sectional limitation of this study, future research could explore the use of longitudinal data. Our findings suggest that there might be one or more mediators other than ILPs, which are missing in our model, thus presenting opportunities for future research. It has also been suggested that there are important synergies between the three dimensions of TBL, which our study did not directly test. Finally, our results are based on the Chilean manufacturing industry, and the authors recommend care in adducing generalisations.

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### ORCID

*Roberto Chavez* https://orcid.org/0000-0002-0662-9059

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