CEO characteristics and sustainability business model in financial technologies firms

Primary evidence from the utilization of innovative platforms

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Abstract

Purpose – This paper aims to investigate and discover the demographic characteristics of corporate leaders (CEOs) in Fintech sector firms representing the implementation of the sustainable business model. Particularly, the purpose is to identify a benchmark profile of CEOs and to understand which are the main features (e.g. age, tenure, education specification, education level, gender, nationality, years of entrepreneurship, years in financial functions, years in IT functions), giving more opportunity to develop and maintain sustainable business models using innovative platforms.

Design/methodology/approach – The research questions are answered through a quali-quantitative methodology using descriptive and statistical approaches. The researchers collected a sample of 100 Fintech firms from the main Fintech firms in 2018 identified by the annual KPMG Report (2019). Thus, the research observed and tested the average level of the major CEO demographic features. Additionally, the paper explored whether these variables have a major probability to affect Fintech leading.

Findings – Assuming a relevant part of Fintech firms, the main results of this paper show the relevance of several CEO demographic characteristics. Additionally, the age, the tenure and the presence of an MBA are significant elements in affecting LEADING companies.

Originality/value – The paper is novel because it contributes to the literature examining the internal governance and sustainable business model, still not explored. Moreover, this study contributes to identifying the CEO demographic characteristics that foster financial institutions' transition towards sustainable business models.

Keywords CEO, Sustainability, Smart technologies, Sustainable business model, Platforms, Cultural drift, Fintech

Paper type Research paper

1. Introduction

Business model innovation is emerging as a potential mechanism to integrate sustainability into business (Schaltegger *et al.*, 2012; Jolink and Niesten, 2015; Evans *et al.*, 2017). Particularly, the ability of innovation in sustainability represents a necessary business capability disruptive innovation (Adam *et al.*, 2016). Nevertheless, there is not yet univocal clarity in the use of the terms "business model", "business model innovation" and "sustainability business model" (Magretta, 2002; Osterwalder *et al.*, 2005; Boons and Lüdeke-Freund, 2013; Bocken and Short, 2016).

Evans *et al.* (2017) develop five propositions that define the concept of the sustainable business model (SBM) as a result of an innovation process/approach. Starting from the contribution on business model innovation (Teece, 2010; Amit and Zott, 2012; Spieth *et al.*, 2014; Foss and Saebi, 2017) and sustainability innovation (Hellström, 2007; Boons and Lüdeke-Freund, 2013; Adams *et al.*, 2016), they highlight that SBMs are not necessarily achieved through technology, products/services innovation alone, but also through the innovation of the business model itself (Girotra and Netessine, 2013; Yang *et al.*, 2017). Thus, firms should innovate the relationships to connect to their stakeholders that, on the one hand, depend on the firm's behaviour and, on the other hand, influence the way to govern a firm (Perrini and Tencati, 2006; Sánchez, 2015).

Bocken *et al.* (2014), based on Jackson's (2009) assumptions, indicate features of route to sustainable economy systems: that encourage minimizing of consumption, that are designed to maximize societal and environmental benefit rather than prioritizing economic growth, that allow nothing be wasted or discarded into the environment, that emphasize delivery of functionality and experience, rather than product ownership, that are designed to provide rewarding work experiences to enhance human creativity/skills and that are built on collaboration and sharing, rather than aggressive competition.

In this scenario, "financial technologies" (Fintech) represent one of the sectors providing innovative platforms to bring funding to sustainability initiatives. In the past 10 years, the financial market has experienced constant revolutionary innovation, for the most part due to the convergence of finance and technology. The financial crisis of 2008 brought the global financial system almost to collapse, and most of the traditional financial institutions became extremely risk-averse. Thus, the leadership of financial innovation has been passed to smaller start-up financial firms or large technology firms that experienced little to no effects from the crisis shock. These players made their success with an intense use of digital tools in the financial processes and a substantial substitution of the classical services with new digital services offered on innovative platforms. The new entrants to financial innovation have been less driven by financial rewards in a traditional sense and more driven by a vision for more social inclusion. The disruptive power of Fintech can lead to a cut in costs and improve the quality of financial services. The "mobile wallets" allow users to make retail payment through their smartphones, and new cross-border platforms allow individuals to transfer money abroad at significantly lower costs; it has increased the use of crowdfunding to fund sustainability initiatives, without forgetting the use of robo-advice and cryptocurrencies that allow for financial inclusion (Puschmann, 2017). Banks established non-bank players (Apple, Google, Amazon), and start-ups may offer all these financial services, increasing the need for traditional banks to modify their business models to develop digital transformation in the financial services industry. In compliance with the SBM archetypes for banks identified by Yip and Bocken (2018), we consider Fintech as key tool to set up an SBM, and Fintechs (the innovative companies that create products and services at the juncture of technology and financial services, seeking to disrupt existing traditional processes and products, dominating the marketplace; KPMG Report, 2019) a real form of SBM. These firms are technology providers that promote, with their products and services, financial and social inclusion and thus support a sustainable growth (Bocken *et al.*, 2016; Park and Mercado, 2015).

Some studies assumed that leaders act as partially constrained decision-makers who shape and manage their organizations (Miller *et al.*, 1982; Hambrick and Mason, 1984) and that the propensity to the innovation (Bantel and Jackson, 1989) and the Corporate Social Responsibility (CSR) policies (Huang, 2013) depends on the CEO/management characteristics. The authors assume that the effective implementation of a CSR strategy allows firms to capture a sustainable competitive advantage (McWilliams and Siegel, 2011). Further, McWilliams and Siegel (2011) base the sustainability of the CSR advantage on considering CSR as a *cospecialized* asset that makes other assets more valuable than they

otherwise would be. CSR attributes and activities may increase the perception, and therefore value, of quality. CSR can be viewed as a form of product innovation (i.e. the creation of new socially responsible product features or categories) or process innovation (i.e. the use of a socially responsible production process) (McWilliams and Siegel, 2001). The propensity of firms to be socially responsible is positively associated with the "intellectual stimulation" dimension of CEO transformational leadership (Waldman *et al.*, 2006a, b), mainly when firms refer to "stakeholder values" (Sully de Luque *et al.*, 2008).

In this perspective, and in response to the call for papers of the special issue of *Management Decision Journal* "Smart technologies for sustainable business model: Adaptation challenges and prospects in economic and cultural drift", this paper aims to examine and draft whether there exist some specific characteristics of the CEO (or top executive, top leader and corporate leader) supporting the formulation and implementation of SBM in the Fintech firms. The main goal is to identify a benchmark profile of the CEO. Thus, the analysis is focused on the CEO demographical attributes characterizing the Fintechs as firms adopting SBM.

Based on these assumptions, the research questions are as follows:

RQ1. What are the specific CEO demographical characteristics assuring a sustainable business model using financial technologies platforms?

RQ2. Which variables affect financial technology companies LEADING guaranteeing sustainable business models and value creation sharing?

The research used a quali-quantitative methodology (Hair *et al.*, 2003) adopting a descriptive and statistical approach. It collected a sample of 100 Fintech firms among top firms listed in the annual KPMG Report (2019) for the year 2018. Particularly, this sample comprises 50 firms belonging to the main LEADING firms of Fintech sector and 50 firms representing the best EMERGING. Thus, this paper observes and tests the average level of the major CEO demographic features identified by existing literature (e.g. age, tenure, education level, education specialization, gender, nationality, career experiences, CEO founder/chairman). Additionally, the paper examines whether these variables have a major probability of affecting the LEADING Fintech firms, considered as the firms with SBMs, assuring their existence on the market.

This study limited its investigation to just the CEO, and not to include other staff members, because the number of the selected firms' sample staff varies from one to five (or more) (KPMG Report, 2019). Thus, to guarantee the comparability of the analysis through the sample, the analysis of this study focused on the CEO. Moreover, the simplified model of governance, with a very short line of command and a slender structure, makes the CEO the real centre of this kind of firm and the CEO's choices the main factor of change in the business orientation towards an innovative business model.

The paper contributes to existing literature extending the internal governance in the form of SBM, as an under-investigated issue. Moreover, assuming the perspectives of the practitioners, the paper is directed at showing opportunities for various corporate governance solutions for an SBM in financial institutions (PWC, 04, 2019). Interestingly, the Fintech and the financial services industry are potential competitors. Among the challenges they face, in the financial services industry, firms need to increase their top management competence, probably to include managers with specific competences in science and engineering. Additionally, this paper's contribution is directed at defining the demographic characteristics that foster a digital strategy towards an SBM.

The remainder of the paper is organized as follows: Section 2 examines the theoretical background. Section 3 presents the methodology. Section 4 analyses the results. Lastly, Section 5 reports the conclusions of the study.

2. Theoretical background

2.1 Sustainable business model and Fintech

The notion of SBM is increasingly seen as a source of competitive advantage (Nidumolu *et al.*, 2009; Kramer and Porter, 2011), and the interest of practitioners and academics in this new business model concept has grown rapidly. The definitions in the literature see the SBM as a modification of the conventional business model concept, with specific characteristics and goals oriented to incorporate concepts, principles or goals that aim at sustainability or to integrate sustainability into their value proposition, value creation and delivery activities (Bocken *et al.*, 2014; Boons and Lüdeke-Freund, 2013; Evans *et al.*, 2017).

Nosratabadi *et al.* (2019) identify 14 application categories of SBM on which the studies of this subject have been conducted. In particular, much research has been conducted on the common fields of innovation, as it plays a crucial role in the search for more sustainable ways of doing business (Winn *et al.*, 2011; Hall and Wagner, 2012). In this sense, it is essential to understand that sustainability innovations regard not only technology but also processes and business models, systems and thinking (Szekely and Strebel, 2013). Sustainability innovation processes require the reconfiguration of several intangible business aspects strictly linked to human resources, such as capabilities, stakeholder relationships, knowledge management, leadership and culture (Adams *et al.*, 2016). These elements are fundamental to make substantial improvements reflecting on production processes, products and services (Schaltegger and Wagner, 2011). Indeed, it is possible to say that the research issue of innovation towards SBM is multidimensional and complex (Hart and Milstein, 2003), but at the end we can classify the works in two categories.

In the first group, Evans *et al.* (2017) provided five steps for such transformation towards an SBM. These are: design sustainable value with economic, social and environmental benefits; create a system of sustainable value flows among multiple stakeholders; generate a value network with a new purpose, design and governance; consider the stakeholder interests and responsibilities for mutual value creation; internalize externalities through the product service system. Geissdoerfer *et al.* (2016) developed the concept of "Value Ideation": to design an SBM, it is necessary to design a sustainable value proposition in which additional forms of value are created by identifying formerly underserved stakeholders in the value proposition. Likewise, Oskam *et al.* (2018) proposed the concept of "value shaping" for sustainability-oriented innovations that can clarify all types of financial, social and environmental values a business creates by interacting with different networks. A specific design framework is proposed by Biloslavo *et al.* (2018). The authors introduced the "Value Triangle" that allows a firm to capture economic value from a circular value system. Joyce and Paquin (2016) provided a different approach to designing SBM, using their triple-layered business model canvas. Lastly, Roman *et al.* (2018) proposed a three-step approach to designing an SBM for progressing towards an open-access database.

In the second group of studies, Geissdoerfer *et al.* (2018) indicated four types of SBM innovation: (1) sustainable start-ups: the creation of a brand new entity; (2) SBM transformation: the current business model is changed, resulting in an SBM; (3) SBM diversification: without major changes in the existing business models of the organization, an additional SBM is established; and (4) SBM acquisition: an additional, SBM is identified, acquired and integrated into the organization. These four innovations are expected to aim at implementing certain SBM types and strategies. The SBM types include circular business model innovation (Bocken *et al.*, 2016), social enterprises (Defourny and Nyssens, 2010), bottom-of-the-pyramid businesses (Prahalad, 2009) and product service systems (Tukker, 2004). Bocken *et al.* (2014) tried a classification of the strategies and synthesized eight generic SBM strategies, called "archetypes". The strategies comprise: *maximize material and energy efficiency*; *create value from "waste"*; *substitute with renewables and natural processes*; *deliver functionality rather than ownership*; *adopt*

a stewardship role; *encourage sufficiency*; *repurpose the business for society/environment*; and *develop scale-up solutions*.

Afterwards, two other studies reviewed the archetypes. Yip and Bocken (2018) substituted some of the original archetypes to adapt the framework to firms in the financial sector. Ritala *et al.* (2018) added a ninth strategy. In particular, in the first, the authors introduced as specific archetypes for financial companies the *substitute with digital processes*, which takes the place of *substitute with renewables and natural processes*, to reflect the nature of the service. As one of the characteristics of the service industry is the combination of the process and the client in the delivery of the final product (Kotler, 1991), this modification is used to emphasize the linkage between the process and the customers in delivering value. The use of digital services will result in a reduction in paper usage and face-to-face contact between staff members and customers, with a simplification in the access of people to financial markets and their opportunities. Thus, this archetype is strictly linked to the new archetype, *inclusive value creation*, introduced by Bocken *et al.* (2016), taking the place of *creating value from "waste"*, and by Ritala *et al.* (2018), representing the ninth archetype, valid not only for the financial sector. In the specific case of financial services, this strategy provides the giving or improving of the access to financial products and services to meet different needs, focusing on the opportunity for people that traditionally have more difficulties in reaching the traditional channels to benefit from all the diverse financial products offered by the market.

The "financial technologies" (Fintech) seem to represent the main sector where the single firm can provide the specific services needed to pursue the two strategies that, following Yip and Bocken (2018), can bring towards an SBM. Indeed, a typical Fintech company will give digital financial services to its customers, replacing traditional paper-intensive services and reaching those clients that are normally far away from the classical circuit of the traditional financial market. Thus, Fintech firms are an example of SBM in the financial sector, as they pursue specific strategies that are part of the innovation process of this particular business model.

2.2 Management characteristics and innovation and sustainability motivation
Firms' strategic choices generally depend on decision-makers' values and cognitive bases (Hambrick and Mason, 1984). The strategic choices are based on the personal interpretation of the organizations' powerful actors (such as the CEO). His or her experiences, values and personality affect the way firms attend to the stakeholder expectations/demands (Hambrick, 2007). Thus, the decision-makers' characteristics influence the strategic choices that allow firms to create and share value among their stakeholders.

This is one of the most important parts of the stakeholder theory (defined as *descriptive*), focusing on whether and to what extent managers attend to various stakeholders and act following their interests (Margolis and Walsh, 2003). To be successful in the global competition, generally, firms need to be continuously oriented to the innovation (Bantel and Jackson, 1989, p. 107) and to base their business model on a CSR strategy for a sustainable corporate development (Huang, 2013). Compliant with Yip and Bocken (2018), several current sustainability practices, mainly in the banking sector, may look more like product/process innovations, where business model innovation is a systems-oriented approach, not only process and product innovation (Laukkanen and Patala, 2014; Peric and Djurkin, 2014). In this perspective, the business model innovation is a mind-set change that starts with (product/process) innovations, and the innovative business models are the ultimate result of a deliberate and continuous process of embedding social and environmental benefits in regular profit-making activities (Lüdeke-Freund *et al.*, 2016).

Based on these proposals, innovation and sustainability (Gretzel *et al.*, 2015; Wu *et al.*, 2018; Lombardi, 2019) are two different strategic choices that allow firms to create and share

value among stakeholders. *Integrated ecological, social and economic value creation is likely to require radically new business models* (Lüdeke-Freund *et al.*, 2016, p. 29). These strategic choices depend on the values and the attitude of the top executives. Hambrick and Mason (1984) assumed that the firms' strategic choices and performance levels are partially predicted by managerial background characteristics, where the cognitive frames of leaders can be approximated to their demographic characteristics (Hambrick, 2007). Previous literature demonstrated that the main demographic characteristic variables affect the strategic choices (Hambrick and Mason, 1984; Wiersema and Bantel, 1992; Anderson, 2003), particularly referring to the innovation choices (Bantel and Jackson, 1989) and sustainability ones (Huang, 2013).

Thus, the major demographic characteristics identified in the literature are age, tenure, education level, educational specialization, gender, nationality and career experiences. According to literature, the basic assumptions are as follows:

2.2.1 Age. There are several reasons for the expectation that a younger manager brings better cognitive resources to decision-making tasks. First, some cognitive abilities seem to diminish with age; second, younger managers are likely to have received their education more recently than older managers, so their technical knowledge should be superior; third, younger managers have been found to have more favourable attitudes towards risk-taking (Bantel and Jackson, 1989). Managerial youth appears to be positively associated with corporate growth (Child, 1974; Hart and Mellons, 1970). Bantel and Jackson (1989) found that managerial team age was more strongly correlated with innovation than CEO age (Bantel and Jackson, 1989). Huang (2013) supposed a positive relation between age and CSR strategy, but observed that CEO age was not a specific determinant of a sustainable corporate development.

2.2.2 Tenure. Tenured top executives may have a major psychological commitment to the organizational status quo and organizational value. Consequently, change, which is an inherent part of innovation, may be resisted (Bantel and Jackson, 1989; Wiersema and Bantel, 1992). According to these studies, there is a significantly negative correlation between tenure and innovation. The conclusions of the authors evidenced that tenure is likely a barrier to the introduction of a relevant change in corporate strategy within a company. On the other hand, Huang (2013) found a significantly positive association between tenure and sustainable corporate development.

2.2.3 Education level. The education level attained is usually correlated with cognitive ability, and higher levels of education should be associated with the ability of top executives to generate (and implement) creative solutions to complex problems. High levels of education have consistently been associated with receptivity to innovation (Kimberly and Evanisko, 1981). The association between education and both cognitive abilities and attitudes towards innovation suggests that the more innovative firms should have highly educated top executives (Bantel and Jackson, 1989). Previous studies found a significantly positive association between the educational level of executives and the propensity to innovate (Bantel and Jackson, 1989; Wiersema and Bantel, 1992).

2.2.4 Education specialization. Professional education in management is associated with moderation. On the one hand, it is assumed that MBA candidates by nature are probably not as innovative or risk-prone as "self-made" executives. On the other hand, it is assumed that professional management education is expected to affect the administrative complexity and sophistication of firms (Hambrick and Mason, 1984). Successively, it is assumed that graduates' perception of CSR issues is higher if they have an MBA or a degree in science and engineering (Woodruff, 2006; Lucena and Schneider, 2008; Wu *et al.*, 2010).

2.2.5 Gender. The executives' gender affects the strategic outcome firms define (Anderson, 2003; Manner, 2010). Carpenter *et al.* (2004) suggest that gender is a characteristic that needs more focus in upper echelon research. Gender seems to be a relevant characteristic to test

relative to corporate social performance (CSP), given that many of the same studies that find economics students less cooperative also find gender differences (Frank *et al.*, 1993). Previous studies found a significantly positive association between gender and both CSP and CSR ranking data (Manner, 2010; Huang, 2013).

2.2.6 Nationality. Managers who come from developed countries are slightly more oriented to consider CSR in their decision-making processes (Waldman *et al.*, 2006a, b). Huang (2013) did not find a significant association between nationality and sustainable corporate development.

2.2.7 Career experiences. Career experiences can affect the types of action taken by managers. It is assumed that a CEO brought in from the outside tends to make more changes in structure, procedures and people than a CEO promoted from within (Hambrick and Mason, 1984). Executives carry as part of their cognitive and emotional principles the experiences they have had during their careers. Executives who have spent their entire career in one organization can be assumed to have relatively limited perspectives.

Mainly, managers with differing histories of functional experiences are likely to differ in their attitudes, knowledge and perspectives (Hambrick and Mason, 1984). A person's functional background should affect which problems he/she identifies, the type of solution generated, the evaluation of alternative solutions and involvement during the implementation phase (Bantel and Jackson, 1989). An important precursor of innovation is the ability to combine facts and ideas in a novel way (Rothwell and Zegveld, 1985). Previous literature demonstrated a significant positive association between the propensity to innovate and the career experiences/functional experiences. Adams *et al.* (2005) tested the positive impact of a CEO founder on corporate performance, based on the assumption that this characteristic has repeatedly been used as an indication of an executive's power.

For the development of this research, it is also essential to define the concept of sustainability, on which the idea of a SBM present in this article is based, specifically referring to Fintech firms. Although it is a contested one, and the literature is rife with attempts to define it (Robinson, 2004), the sustainability concept, when applied to SBM, could be seen as a sort of evolution of the ecological modernization (EM) (Stubbs and Cocklin, 2008). Firms aiming at an EM perspective of sustainability focus at the same time on being profitable, improving the welfare of their stakeholders and minimizing environmental impact, the so-called triple bottom line of people, planet and profit (Fisk, 2010). Gladwin *et al.* (1995) refer to this as shifting from "greening", where there is a focus on aims based on instruments and processes (such as pollution reduction), to "sustaining", where the focus is on outcomes such as assuring ecosystem and socio-system health and integrity. In order to define the concept for our work, it can be said that sustainability in financial firms refers to delivering financial products and services that are developed to meet the needs of people and safeguard the environment while generating profit.

3. Methodology
The methodology of this research is based on the quali-quantitative method to answer the research questions: RQ1. *What are the specific CEO demographical characteristics assuring a sustainable business model using financial technologies platforms?* RQ2. *Which variables affect financial technology companies* LEADING *guaranteeing sustainable business models and value creation sharing?* We retain the application of the qualitative and quantitative methods useful to achieve reliability and the attributes of good research. In this direction, "Good research is the result of a careful, thoughtful, knowledgeable approach, whether qualitative and quantitative research method is used. Indeed, we advocate using both qualitative and quantitative approaches in the same research in many instances because each has its role, and sometimes both are used in the same research project" (Hair *et al.*, 2003, p. 275).

Particularly, in answering RQ1, the paper adopted a descriptive method (content analysis) to understand on average the existence of CEO demographic characteristics in the Fintech firms of the sample. To answers RQ2, the paper assumed that firms with an SMB are more likely to persist on the market by strategic choices that allow firms to create shared value between managers' personal interests and the social causes (McWilliams and Siegel, 2001). Thus, the focus of the analysis is a cross-Fintech type (LEADING/EMERGING) comparison using a statistical method. The following sub-sections describe data and sample collection and data analysis.

3.1 Data and sample collection

We collected a sample of 100 Fintech firms listed in the Fintech100 by the Annual KPMG Report (2019). The Fintech100 is a collaborative effort between H2 Ventures and KPMG that analyses the Fintech space globally. The annual report highlights those companies globally that are taking advantage of technology and driving disruption within the financial services industry. A judging panel comprised of H2 Ventures and KPMG was used to decide on the final composition of the Fintech100 list. Thus, firms of our sample are identified as the main financial technology firms during the year 2018. The Fintech100 is divided into two parts: (1) the "Top 50", "LEADING", established Fintech firms around the globe, which are ranked based on innovation, capital-raising activity, size and country; and (2) the "EMERGING 50" firms, which are newer companies that are at the forefront of innovative technologies and practices. The companies in the Fintech100 are selected following extensive global research and analysis based on data across a range of dimensions, including the following five core factors:

(1) Average annual capital raised;

(2) Rate of recent capital raising;

(3) Geographic diversity;

(4) Sectoral diversity;

(5) X-factor: the degree of product, service and business model innovation (a subjective measure that is applied only concerning companies appearing on the *Emerging* list).

These selection criteria are the key metrics used to calculate the rankings of companies in the Fintech100. The aforementioned assessment criteria reflect the fact that venture capital invested is a relevant measure of innovation, which in turn fuels enduring competitive advantage. Venture capitalists seek this enduring competitive advantage over and above anything else. The complete list of firms in the Fintech100, divided into LEADING and EMERGING, is reported in Table I.

3.2 Data analysis

A content analysis approach was applied to recognize whether and which are the demographical characteristics of the CEOs supporting the development of the SBM in the Fintech sector. Thus, we tested the presence of the CEO characteristics following the international literature (Hambrick and Mason, 1984; Bantel and Jackson, 1989; Adams *et al.*, 2005; Waldman *et al.*, 2006a, b; Woodruff, 2006; Lucena and Schneider, 2008; Wu *et al.*, 2010; Andersoon, 2003; Manner, 2010; Huang, 2013), as reported in Section 2. The variables assumed to develop the content analysis are the following:

(1) Age: Number of years of the CEO.

(2) Tenure: Number of years the CEO is in the firm.

LEADING	EMERGING
Ant financial	AgriDigital
JD finance	Anyfin
Grab	Aqeed technology
Du Xiao Man Fin.	Bankera
SoFi	Blackmoon Fin. Group
Oscar health	BlockFi lending
Nubank	Brex
Robinhood	Cashaa
Atom bank	Cellulant
Lufax holding	Cleo
OneConnnect (Ping An Yizhangtong)	Coya
51 credit card	Crypterium
Revolut	DAYLI Fin. group
Compass	Dreams
Stripe	Funding societies
Clover health	Geru
Adyen	InstaReM
Policybazaar	Konfio
Klarna	Kredivo
ACORN Oaknorth holdings	Kyber network
Kreditech holding	Liwwa
Monzo	Look who's charging
Welab	MoMo
Number 26 (N26)	Nod
WealthSimple	Omise
AfterPay touch	Payr
Dianrong	PaySense
Viva Republica (Toss)	PayTabs
QUOINE	Pleo
Kabbage	Polymath
Affirm	Plussimple (+simple)
OurCrowd	Power ledger
SolarisBank	Pundi X
Future finance	Quantexa
Neyber	Recordsure
ZhongAn	Ripio credit network
TransferWise	Shift technology
Pushpay	Singlife
League Inc.	Tala
Circle	Tally technologies
Lendingkart	TenX
Opendoor	ThisIsMe
Metromile	Tide
Folio	Tiger brokers
Lendix	Tpaga
GuiaBolso	Trade ledger
Starling bank	Varo money
Coinbase	Wallet.ng
Airwallex	Wave money
Lemonade	WeBank

(3) Education specialization: *Scientific_Bachelor/Other_Bachelor*; *where*: *Scientific_*Bachelor:
The CEO has a bachelor's in economics, engineering, computer science or in all the
other considered BS and BSc degrees; *Other_Bachelor*: The CEO has a bachelor's in all
other non-missing bachelor's degrees.

(4) Education level: The CEO has a bachelor's, master's degree, MBA, PhD.

(5) Gender: The CEO is a male, or the CEO is a female.

(6) Nationality: The CEO is North American, Asian, European, Australian or others (South American and African)[1].

(7) Career experiences:

- The number of years in which the CEO has been an entrepreneur

- The number of years in which the CEO has been employed in financial functions

- The number of years in which the CEO has been employed in IT functions.

Applying a content analysis, a data hand collection was used to extract the data that referred to CEO characteristics supporting the SBM and the utilization of innovative platforms. Used mainly as research sources were firms' websites, LinkedIn, Facebook, crunchbase and Bloomberg.

Additionally, the focus of the analysis is a cross-Fintech type (LEADING/EMERGING) comparison using a statistical method. We applied the *t*-test on the means of the numerical value and the Chi-square contingency test on the frequencies of the binary indicators to find out which variables characterizing better than the others the LEADING or the EMERGING firms.

Successively, the ability of these variables to be predictors for LEADING firms is evaluated. For this determination, a univariate regression analysis is carried out to verify whether any regressor (singularly) has a significant predictive power. Thus, we run a logistic regression to understand the predictive ability of each variable, described earlier, on the binary outcome LEADING/EMERGING. The binary outcome assumes value 1 for LEADING and 0 for EMERGING.

Analysis is performed through the following logit model for a binary dependent variable:

$$\text{Type of Fintech} = \beta_0 + \beta_1 \text{ Age} + \beta_2 \text{ Tenure} + \beta_3 \text{ Education\_specialization} \\ + \beta_4 \text{ Education level} + \beta_5 \text{ Nationality} + \beta_6 \text{ Career experiences} + \varepsilon_0.$$

The variables in aforementioned logit regression are measured as follows:
Age: Number of years of the CEO;
Tenure: Number of years the CEO is in the firms;
Education_specialization:

Scientific_Bachelor is a dummy variable that assumes value 1 when the CEO has a bachelor's degree in economics, engineering, computer science or all the other considered BS and BSc degrees;

Other_Bachelor is a dummy variable that assumes value 1 when the CEO has a bachelor's in all other non-missing bachelor's degrees.

Education_level:

Bachelor's degree is a dummy variable that assumes value 1 when the CEO has a bachelor's degree;

Master's degree is a dummy variable that assumes value 1 when the CEO has a master's degree;

MBA is a dummy variable that assumes value 1 when the CEO has an MBA;

PhD is a dummy variable that assumes value 1 when the CEO has a PhD.

Nationality:

North American is a dummy variable that assumes value 1 when the CEO comes from North America;

Asian is a dummy variable that assumes value 1 when the CEO comes from Asia;

European is a dummy variable that assumes value 1 when the CEO comes from Europe;

Australian is a dummy variable that assumes value 1 when the CEO comes from Australia;

Other_nationality is a dummy variable that assumes value 1 when the CEO comes from Africa or South America.

Career experiences:

CEO founder/cofounder is a dummy variable that assumes value 1 when the CEO is the founder or cofounder of the Fintech firm;

Entrepreneur_previous years: number of years in which the CEO was an entrepreneur in the previous experience before coming to the Fintech firm;

Financial function_previous years: number of years in which the CEO was employed in financial functions in the previous experience before coming to the Fintech firm;

IT function_previous years: number of years in which the CEO was employed in IT functions in the previous experience before coming to the Fintech firm.

Control variables were not included in this phase of the study. Previous literature identified as control variables the profitability measures, because coherent with the responsible variable (CSP or CSR ranking data) (Manner, 2010; Huang, 2013), the organizational/team size measures or the location of the state of operation (Bantel and Jackson, 1989; Wiersema and Bantel, 1992). The present study is based on a data hand collection of the information by different Web sources, and several of these data were not available. That would have generated several missing data in the data set.

Lastly, we discussed results from the descriptive analysis and statistical analysis achieving investigator triangulation. Section 4 presents the results of the analysis and discussion.

4. Results and discussion

The following section presents the analyses answering the research questions: RQ1. *What are the specific CEO demographical characteristics assuring a sustainable business model using financial technologies platforms?* RQ2. *Which variables affect financial technology companies LEADING guaranteeing sustainable business models and value creation sharing?*

Summarizing the results, Table II provides descriptive statistics of the CEO demographical characteristics of the Fintech firms explored, and which answer the first research question (RQ1).

The analysis underlines that, on average, the CEO of a Fintech firm is approximatively 39 years old. Generally, the CEO has been active in that concern for at least five years. On average, just 42 percent of the sample has a scientific education, while 49 percent of the sample has a non-scientific education. The CEO of the financial technology firms of the sample has, on average, a bachelor's degree for 64 percent (of which the 56 percent (=36 percent/64 percent) have a scientific bachelor's degree), a PhD for 39 percent, a master's degree for 27 percent and an MBA for 5 percent.

Variable	Binary indicators	Mean	Std. Dev.	Min	1st quartile	Median	3rd quartile	Max
Age		39.24637681	8.264747598	23	34	38	45	64
Tenure		5.183673469	2.869487324	0	3.25	5	6	15
Education specialization	Scientific_education	0.42	0.496049637	0	0	0	1	1
	Scientific_bachelor	0.36	0.4824181513	0	0	0	1	1
	Scientific_master	0.18	0.3861229197	0	0	0	0	1
	Other_education	0.49	0.6589707309	0	0	0	1	2
	Other_bachelor	0.28	0.4512608599	0	0	0	1	1
	Other_master	0.21	0.4093601807	0	0	0	0	1
Education level	Bachelor's degree_yes	0.64	0.4824181513	0	0	1	1	1
	Master's degree_yes	0.27	0.4461960433	0	0	0	1	1
	MBA_yes	0.05	0.2190429136	0	0	0	0	1
	PhD_yes	0.39	0.49020713	0	0	0	1	1
Gender	Male	0.94	0.2386832566	0	1	1	1	1
	Female	0.06	0.2386832566	0	0	0	0	1
Nationality	North American	0.17	0.3775251681	0	0	0	0	1
	Asian	0.34	0.4760952286	0	0	0	1	1
	European	0.29	0.4560480216	0	0	0	1	1
	Australian	0.07	0.2564324	0	0	0	0	1
	Other_nationality	0.09	0.2876234913	0	0	0	0	1
CEO founder/cofounder		0.77	0.4229525847	0	1	1	1	1
Career experiences								
Entrepreneur_previous years		6.571429	6.185769	1	1	4.5	10	19
Financial function_previous years		9.309434	6.770816	4	5	8	14	26
IT function_previous years		7.25	5.24751	0	4	5.5	10	23

Table II.
Descriptive Statistics of the CEO demographical characteristics

Of the CEOs explored in the sample, 94 percent are male and just 6 percent are female. The top leaders analysed are 34 percent Asian, 29 percent European, 17 percent North American, 7 percent Australian and 9 percent African and South American. This highlights that the drive towards the use of smart technologies in the financial sector originates with more than 50 percent of people coming from Asia and Europe. In 77 percent of cases, the CEO is also the founder or cofounder of the firm. Among the previous careers, experiences emerged that the CEOs had, on average, gained experiences as entrepreneurs for 6.5 years and were employed in financial functions for 9.3 years or IT functions for 7.25 years.

To answer the second research question, this study investigates what CEO features distinguish a LEADING Fintech firm, assuming that they are firms able to create and share value among stakeholders and destined to last on the market. For this purpose, a series of t-tests is performed on means of the numerical variables. Table III shows the results.

Table III shows significant differences in the means between LEADING and EMERGING firms in the age, tenure and previous years spent as an entrepreneur by the CEO. On average, LEADING CEOs are five years older than their EMERGING counterparts, and they have been on the job two to three years longer. This is perhaps explained by their longer previous experience as entrepreneurs (almost six years longer). Turning to the categorical variables, which must be analysed differently because their values are indicators, a Chi-square contingency test is performed on the frequencies of the binary indicators to identify differences in the characteristics of LEADING and EMERGING firms, first including the whole sample and then sub-scoping on education specialization, education level, gender, nationality, founder/cofounder.

No significant differences are observed in the frequencies for any of the sub-samples tested. The two groups, EMERGING and LEADING, seem to be drawn from a similar population. Besides age, tenure and experience as an entrepreneur, valuable predictors are not found for LEADING firms. A univariate regression analysis was carried out to verify whether any regressor, singularly, has significant predictive power. A logistic regression was run to try to predict a binary outcome (1 for LEADING, 0 for EMERGING). The indicators male and female are not tested in the logistic regression because of the results of the previous test on their frequency.

As was reasonably expected, the significance of age, tenure and experience as an entrepreneur is confirmed, but additionally, we observe that bachelor's degree, MBA and other nationality are also approximately 10 percent significant. The findings on age and

Variables	LEADING	EMERGING	T-statistics	p-value (significance)
Age	41.583333	36.69697	−2.550620284	0.01**
Tenure	6.458333	3.96	−4.76669356	0.00***
Entrepreneur_previous years	8.875	3.5	−1.727347255	0.10*
Financial Func_previous years	10.18	8.407407	−1.008053077	0.31
IT Func_previous years	8.032258	6.5	−1.17468761	0.24
Note(s): *$p < 0.10$, **$p < 0.05$, ***$p < 0.01$				

Table III.
T-test for the difference between the means of numerical variables

Variables	Chi-square statistic	p-Value (significance)	Difference
Education specialization	1.02627	0.311036	1
Education level	4.9629	0.174534	3
Gender	0	1	1
Nationality	5.529142656	0.237179668	4
Founder/Cofounder	0	1	1
Note(s): *$p < 0.10$, **$p < 0.05$, ***$p < 0.01$			

Table IV.
Chi-square on binary indicators (95 percent significance level)

Table V.
Results of logistic regression for the binary variable *LEADING*

Models	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
							Dependent variable: binary LEADIND										
Age	0.0808 (2.363)**																
Tenure		0.4351 (3.81)**															
Scientific_education			−0.4953 (−1.212)														
Other_education				0.4953 (1.212)													
Bachelor's degree_yes					−0.8472 (−1.87)*												
Master's degree_yes						0.3212 (0.8)											
MBA_yes							0.799 (1.727)*										
PhD_yes								−1.4495 (−1.275)									
North American									0.7268 (1.314)								
Asian										−0.1784 (−0.422)							
European											0.0972 (0.22)						
Australian												−0.9808 (−1.138)					
Other_nationality													−1.3628 (−1.644)*				
CEO founder/cofounder														−0.113 (−0.238)			
Entrepreneur_previous years															0.2159 (1.71)*		
Financial function_previous years																0.042 (1.008)	
IT function_previous years																	0.0615 (1.165)
Intercept	−3.0641 (−2.273)***	−2.2303 (−3.709)**	0.1625 (0.697)	−0.2877 (−0.923)	0.6466 (1.74)*	−0.1671 (−0.577)	−0.1924 (−0.818)	0.0632 (0.308)	−0.1206 (−0.548)	0.0606 (0.246)	−0.0282 (−0.119)*	0.0645 (0.311)	0.11 (0.524)	0.087 (0.208)	−0.9218 (−1.004)	−0.284 (−0.609)	−0.4115 (−0.9)
Pseudo R^2	0.06748	0.1636	0.01069	0.01069	0.0283	0.00462	0.01809	0.01459	0.01294	0.00128	0.00035	0.01028	0.0232	0.00040	0.1734	0.1734	0.01674

Note(s): *$p < 0.10$, **$p < 0.05$, ***$p < 0.01$

tenure do not seem to be consistent with the results of the previous literature on innovation (Bantel and Jackson, 1989; Wiersema and Bantel, 1992). Indeed, comparing the average age of our sample (approximately 39) and the others (45 in Bantel and Jackson, 1989; 55 in Wiersema and Bantel, 1992), it follows that we are examining firms led by CEOs who tend to be younger than the average of companies that do not operate in the Fintech sector. In this view, a positive effect of age was interpreted. We arrived at the same conclusion comparing the average tenure of our sample (approximately five) and the others (14 in Bantel and Jackson, 1989; 20 in Wiersema and Bantel, 1992).

Concerning MBA, the significant positive coefficient symbolized that, even if in a smart-technology-oriented sector, a LEADING company confirms the old tradition of having executives with an MBA, while a younger Fintech probably nominates its founding developer as CEO.

The significant negative coefficient of bachelor's degree could suggest that this type of firm provides a minimum level of training, at least represented by the bachelor's degree in an emerging phase. Also, other nationality, which includes African and South American, has a negative coefficient: CEOs from these continents are more likely to be in EMERGING companies. This perhaps represents a shift towards a higher diversity in younger generations, as well as an opening of the Fintech market in these areas.

5. Conclusions, limitations and future research
The present paper examined the CEO characteristics in Fintech firms, characterized by the utilization of smart technologies in the form of innovative platforms. Thus, this paper responds to the special issue from *Management Decision* "Smart technologies for a sustainable business model: Adaptation challenges and prospects in economic and cultural drift", providing interesting results for academic and practical communities.

Adopting a quali-quantitative methodology, this paper used a descriptive and statistical approach to discover CEO characteristics supporting the development of SBM using a sample of 100 Fintech firms. In this sense, the features of the Fintech firms appear to overlap with the specific characteristics of a firm with an SBM, following what is said by the previous literature on this issue. In particular, Bocken *et al.* (2014) elaborated eight strategies to create a process towards the SBM that, nevertheless, are valid for the industrial and manufacturing sector. Subsequently, Yip and Bocken (2018) developed their theories and gave us a specific indication for the financial sector. They elaborated two new so-called archetypes, digitalization and inclusion, that, in our opinion, can be found in the business model present in the Fintech firms, which can be seen as a sort of harbinger of the SBM for the financial industry.

Indeed, the services the firms offer are bearers of both digitalization of the processes and inclusion of the customer. The opportunities offered by new financial technologies allow the Fintech firms to avoid paper-wasting activities, follow an ecological approach and reach every client in the world, even those in particular situations or geographical context, creating value through inclusion. Thus, this new kind of company can represent an example for the traditional firms in the financial sector to follow in the implementation of an SBM that is adequate for the specific context in which these companies are moving. In this perspective, this paper is an attempt to identify the top executive characteristics of the Fintech firms. Thus, we defined whether and what is the cognitive frame able to orient the CEOs to organize their companies towards the SBM.

Many traditional banks have to, or will have to, modify their business model, transforming it from the mainstream banking model to a model based on digitalization and financial technologies. All that suggests that the traditional banks have to face up to some challenges in terms of corporate governance, internal control systems, risk management and

organizational structure (PWC, 04, 2019). Focusing on the impact of the introduction of digitalization and the financial technologies in the traditional financial companies, our work would contribute to recognize the demographical characteristics of the Fintech firms' CEOs and to provide a set of features to consider in the selection of the top leaders' composition for the firms that are implementing the financial technologies.

The literature on the upper echelons theory states that executives' experiences, values and personalities greatly influence their interpretations of the situations they face and, in turn, affect their choice (Hambrick and Mason, 1984; Hambrick, 2007), identifying as proxies of firm leaders' cognitive frames their demographic characteristics. The results of the present descriptive analysis evidence that the CEOs of the Fintech firms are approximatively younger than 40 years old, with a tenure in that company of at least five years. More than half of the sample has at least a minimum level of education corresponding to a bachelor's degree, of which 56 percent is in science. In 40 percent, the CEO has a top of level education, a PhD, and in 5 percent they obtain an MBA. Males are 94 percent of CEOs in the sample, and in 77 percent of the cases, they are also the founder or cofounder of the Fintech firm. Our findings on age and tenure suggest that a CEO who is inclined to a digital strategy towards an SBM should be relatively young as well as having gained some experience not only in the company but also in the specific sector.

Referring to the career experiences, this paper evidences that the top executives explored, even if still young, have previous experiences as entrepreneurs or working in financial or IT functions. The results of the second part of the analysis, which focused on whether specific variables exist that characterize the *LEADING* Fintech firms, show that, besides age and tenure, the experience gained as an entrepreneur and having obtained an MBA favour the determination of a Fintech as a *LEADING* firm, while a bachelor's degree represents the minimum level of education to be classified as an *EMERGING firm*.

We consider the findings consistent with the literature that examines the CEO or top management demographic characteristics, thus extending existing theories (Hambrick and Mason, 1984; Bantel and Jackson, 1989; Andersoon, 2003; Adams *et al.*, 2005; Waldman *et al.*, 2006a, b; Wu *et al.*, 2010; Manner, 2010; Huang, 2013).

The study assumed that the Fintech should have an SBM, so the significance of the impact of MBA, tenure and Enterpreneur_years on *LEADING* Fintech firms might be interpreted following the previous assumptions in the upper echelons theory. According to this, professional management education is expected to have an effect on the administrative complexity and sophistication of firms, both because of the types of people who are drawn to the business schools, who are known as "organizers and rationalizers" and because of the emphasis placed on complex administrative systems in the business schools (Hambrick and Mason, 1984).

Additionally, Hambrick and Mason (1984) assumed that executives carry as part of their cognitive and emotional principles the experiences they have had during their careers. Executives who have spent their entire careers in one organization can be assumed to have relatively limited perspectives. At the same time, more tenured executives may have more psychological commitment to the organizational value (Bantel and Jackson, 1989). The Fintech sector is unexplored as a research field, in particular regarding the SBM issue: the relatively recent birth of these firms and the peculiarities of their activity make them an interesting but, at the same time, complex object of observation. It could be interesting to analyse in future developments not only the influence of CEO demographic characteristics on the process towards SBM but also their impact on governance, strategies and others. Moreover, the process of transition towards the SBM in the traditional financial entities is still far from ending and in many cases even far from starting. The paths that lead those firms to a business model oriented to sustainability are without any doubt a fascinating research issue to foster in prospects.

The present findings have some practical implications for business practitioners. As noted earlier, companies face many changes, mainly in the banking sector. They have to redefine their business model, motivated by innovation and sustainability, in order to guarantee their financial and social inclusion and thus a sustainable growth. In this view, many firms have to review their internal governance, and it is crucial for management to have some idea regarding the demographic characteristics of a CEO that fosters the digital strategy toward an SBM in Fintech firms. Particularly, the tenure in this kind of company as well as an MBA and past experience as an entrepreneur could suggest that a potential top executive should have practical and specialized competencies in managerial knowledge and experience in the innovative technology sector.

One of the limits of the paper derives from the analysis of only one sector. To date, the financial revolution of the past decade led to extend the Fintech space. Many large, established technology giants, such as Google, Apple and Amazon, in the United States are entering the financial service industry. Smaller start-ups, in particular robotic advisors, a.k.a. robo-advisors, have been taking market shares from traditional asset management firms. In China, firms such as Tencent and Alibaba have created a whole new field of online finance (Chen, 2018). The actual competition in the financial sector has to consider the financial innovation (mobile banking, trading, investment and insurance business on the innovative platform), pushing many companies to innovate with digital processes for customer contact with the target to minimize or eliminate the traditional branch network through Fintech. On these assumptions, in future research it could be important to extend the analysis to the companies that employ the financial technology even if they are not defined as "FinTech companies". In this perspective, future studies could focus on the top management and not only on the CEO, trying to capture the role of the heterogeneity in the team executive's composition.

Finally, although every effort was made to be comprehensive in data collection, this study does suffer some limitations. We were unable to define control variables. The characteristics of the Fintech companies, usually small, unstructured and emerging firms, make data retrieval difficult. Despite these limitations, the straightforward yet insightful findings reported in this exploratory empirical work provide an overall image of CEO demographic characteristics that could qualify the strategic choice towards an SBM in Fintech companies.

Note
1. African and South American are merged because the frequency of African in LEADING is 0.

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