Overconfidence among solo entrepreneurs: the role of national culture

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Received 26 August 2022
Revised 12 December 2022
17 February 2023
Accepted 3 April 2023

Abstract

Purpose – This study investigates entrepreneurial overconfidence (EOC) levels among solo entrepreneurs at the country level. Although transitions from solo to employer entrepreneur are relatively rare, the solo self-employed have become an important source of potential job creation by virtue of the sharp increase in their numbers in the past two decades. When EOC levels are too high, job creation ambitions may be unrealistic and unrealised. Unrealised ambitions and business failure can lead not only to psychological and financial costs for the individual entrepreneurs involved, but at the societal level also to wasted government resources, and increased costs for the entrepreneurial ecosystem as a whole. Therefore, it is important to know more about the entrepreneurial overconfidence levels of solo entrepreneurs in different countries and their determinants.

Design/methodology/approach – Using Global Entrepreneurship Monitor data for 71 countries over the period 2013–2016, the authors construct a new measure of entrepreneurial overconfidence of solo entrepreneurs and relate this to three recently developed indicators of national culture.

Findings – The findings indicate that EOC levels are positively related to Joy (versus Duty), and negatively related to Trust (versus Distrust). Finally, no significant relationship between entrepreneurial overconfidence and Individualism is found in the study (versus Collectivism).

Research limitations/implications – Given the lack of literature examining the relationship between EOC levels and cultural variables hypotheses were developed using the existent body of knowledge in the area, which is at the early stage of development. The hypotheses derivation has used mostly theoretical arguments relating to the link between national culture and overconfidence of entrepreneurs in general, rather than relating specifically to solo entrepreneurs. The measure of EOC uses expectations of employment growth to proxy overconfidence, but other measures of entrepreneurial success may also be explored.

Practical implications – As the hiring of employees can be a costly process (Coad *et al.*, 2017), it is important that entrepreneurs have realistic expectations of what it requires to hire employees. This is especially the case for solo entrepreneurs since they do not have experience of hiring their own employees. This paper addresses such issues at an aggregate level by exploring what factors explain country differences in overconfidence levels of solo entrepreneurs.

Social implications – It is worthwhile to distinguish between solo and employer entrepreneurs when studying their EOC levels, as the ambitions of these two types of entrepreneurs are different. Empirically, this study introduces a new measure of EOC tailored towards the solo self-employed.

Originality/value – This study contributes to entrepreneurship literature by expanding current knowledge on entrepreneurial overconfidence at the country level. Past research has studied EOC at the individual level, however limited research exists on the phenomenon of EOC from a country level perspective. This is important

Journal of Small Business and Enterprise Development
Vol. 30 No. 4, 2023
pp. 667-691
Emerald Publishing Limited
1462-6004
DOI 10.1108/JSBED-08-2022-0361

as unrealised entrepreneurial ambitions may not only create substantial costs for the individual entrepreneurs involved, it may also lead to substantial societal costs, including waste of government resources.

Keywords Entrepreneurial overconfidence, Self-efficacy, National culture, Solo entrepreneurs
Paper type Research paper

Introduction

Solo self-employment (self-employment without employees) has increased considerably over the last two decades (Burke and Cowling, 2020a), and as a result are becoming an interesting labour market group from a policy perspective (Gevaert *et al.*, 2022). Potentially, they could be an important source of wage-employment creation. If a moderate proportion of solo self-employed workers were to hire one employee, this would make a significant contribution to reducing unemployment rates (Millán *et al.*, 2013). However, hiring employees is not without costs and challenges (Coad *et al.*, 2017), and only a small proportion of solo self-employed hire employees during their venture (Kraaij and Elbers, 2016; Fairlie and Miranda, 2017).

When trying to understand actions by human beings, the renowned Theory of Planned Behavior (Ajzen, 1991) states that intentions are the best predictor of actions. Hence, in order to understand job creation activity by entrepreneurs (i.e. the hiring of employees), studying job creation intentions or ambitions may be a good starting point. Ambitions and intentions are related but distinct concepts; ambitions represent a desire for success or achievement (in this case the entrepreneurs' ambitions to grow their number of employees), intentions represent a course of action that an individual intends to follow. A considerable body of literature exists on entrepreneurial ambitions (see Hermans *et al.*, 2015), but such literature typically focuses on ambitions by start-up businesses with employees, rather than on the ambitions of solo entrepreneurs to turn into employer status.

Ambitions by solo entrepreneurs need to be studied separately from employer entrepreneurs' ambitions, for three reasons. First, entrepreneurs who start a business without employees may have become entrepreneurs for different reasons than those starting out with employees. In particular, non-financial motivations such as autonomy and self-expression may be more important for the solo self-employed (Van Gelderen and Jansen, 2006; Van Stel *et al.*, 2020). Second, the solo self-employed form a heterogeneous group of workers (Cieślik and Dvoulety, 2019; Gevaert *et al.*, 2022), ranging from precarious solo self-employed to highly productive, high earning freelancers (Burke and Cowling, 2020b). It is therefore likely that ambition levels also vary markedly within the group of solo entrepreneurs. Despite this, the ambition levels of solo self-employed workers are seldom studied (exception De Vries *et al.*, 2013). Third, taking into consideration that the overwhelming majority of new businesses start without employees, the combined ambitions of a country's population of solo entrepreneurs are important from a policy perspective as these ambitions to a considerable extent determine the aggregate effect of new business formation on employment.

Entrepreneurial ambitions are a prerequisite for entrepreneurial actions, but not all entrepreneurial ambitions are realised. A common cause of unrealised ambitions is related to overconfidence, whereby individuals make overly optimistic judgments of what they can achieve (Koellinger *et al.*, 2007; Invernizzi *et al.*, 2017). While self-efficacy can be a positive attribute for entrepreneurs to achieve success, it is possible that individuals who possess levels of self-efficacy that are too high will make business success less likely. Unrealised ambitions can lead to costs at both the personal and societal level. At the personal level the solo self-employed may incur psychological costs such as stress and depression (Shepherd, 2003), as well as financial losses resulting from business failure. At the societal level, there are opportunity costs as overconfident entrepreneurs who fail their business could have been more productively employed in the wage sector. To the extent that the failed businesses also employed wage workers, these workers will have to look for a new job as well, possibly

resulting in frictional unemployment. Moreover, if a relatively large share of a country's entrepreneurs is overconfident and are confronted with business failure and debts, this may lead to a large waste of resources, but also to an unsustainable demand for debt counselling services. This has implications for policy makers in designing supports for business creation and entrepreneurial growth and for investors in their assessment of the likelihood of business success of entrepreneurs.

This study is interested in the conditions that lead to levels of self-efficacy that are associated with entrepreneurial overconfidence (EOC) (Newman *et al.*, 2019), which result in the ambitions of entrepreneurs not being realised or only partially realised. At the micro level, the phenomenon of EOC has been studied extensively, and various operationalisations of EOC have been used in empirical research (see Cieślik *et al.*, 2018), but few study EOC at the country level.

A country level perspective is important as countries differ noticeably in their EOC levels, and overly high levels of EOC may hamper economic development (Cieślik *et al.*, 2018). High country levels of EOC may translate into a waste of resources and frustration among a considerable share of the country's entrepreneurs. Hence, country level variations in EOC and the determinants of those variations warrant further investigation.

This study focuses on national culture as a determinant of country levels of EOC, specifically those of solo entrepreneurs. National culture is related to variations in entrepreneurial activity across countries and regions (Kara and Peterson, 2019). This study explores whether cultural differences also account for country variations in entrepreneurial attitudes, in particular levels of EOC. Using Global Entrepreneurship Monitor data for 71 countries over the period 2013–2016, the authors construct a measure of country level EOC of solo entrepreneurs and relate this to three recently constructed indicators of national culture (Beugelsdijk and Welzel, 2018).

This study makes four contributions to extant literature. First, the study approaches the phenomenon of EOC from a country level rather than an individual level perspective, which is rare in the literature. Earlier studies in this small field are Koellinger *et al.* (2007, 2011), and Cieślik *et al.* (2018). Using Global Entrepreneurship Monitor data, Koellinger *et al.* (2007, 2011) link the country "survival" rate of established over nascent entrepreneurs to the share of the population stating that they have the skills to successfully start up a business. They found a negative and statistically significant relationship between these two variables and interpret this as a sign of EOC being present. Cieślik *et al.* (2018) on the other hand construct a direct measure of EOC at the country level which they regressed on various determinants for 23 European Union countries over the period 2004–2015. One of their findings indicated that EOC levels are considerably higher among new EU member countries that entered the EU since 2004.

Second, while focusing on national culture determinants of EOC we have included a broad spectrum of 71 countries from various continents, with different cultural backgrounds and levels of socio-economic development. Such diversity offers a more suitable framework to investigate the role of national culture as compared to Cieślik *et al.* (2018) who covered a set of culturally aligned European countries. Moreover, whereas Cieślik *et al.* (2018) studied ambitions of early-stage entrepreneurs regardless of their employment levels, the present study considers specifically the ambitions of solo entrepreneurs. As explained above, ambitions by solo entrepreneurs need to be studied separately from employer entrepreneurs' ambitions, which is what the present study does.

Third, while studying the relationship between country levels of EOC and national culture, the authors use and validate a new set of culture indicators, developed by Beugelsdijk and Welzel (2018), that integrate Hofstede's and Inglehart's concepts of culture. To date, these indicators have seldom been used in applied research, with the exception of Kara and

Peterson (2019) who link these indicators to regional self-employment rates across various countries.

Fourth, the study creates a link in literature between ambitious entrepreneurship (Hermans *et al.*, 2015) and the emerging literature on solo self-employment (Burke and Cowling, 2020a; Cieślik and Dvoulety, 2019). While the ambitious entrepreneurship literature generally focuses on innovative start-ups with employees and their often-large growth ambitions, this paper concentrates on the growth ambitions of solo entrepreneurs. Although these ambitions are typically more moderate, at the macro level they may have as much impact as the ambitions of the much smaller group of innovative start-ups with employees.

This paper is structured as follows: Section 2 provides a literature review surrounding the concepts and theoretical relationships that are relevant to our study. Research hypotheses regarding the relationships between EOC of solo entrepreneurs and three indicators of national culture are presented in Section 3. Sections 4 and 5 present the empirical analysis while Section 6 draws conclusions and provides implications for theory and practice.

Literature review

This section provides a literature review on the concepts of self-efficacy and EOC and on the relationship between national culture and various aspects of entrepreneurship, including ambitious entrepreneurship, self-efficacy and EOC.

Self-efficacy and overconfidence in entrepreneurship

While reviewing the research on the relationship between individual variables and entrepreneurial status Walter and Heinrichs (2015) have identified somewhat overlapping self-efficacy and overconfidence as important entrepreneur-level determinants while pointing to essential differences in their origins and influence. Following Chen *et al.* (1998), entrepreneurial self-efficacy refers to the "strength of a person's belief that he or she is capable of successfully performing the various roles and tasks of entrepreneurship" (p. 295). As such, entrepreneurial self-efficacy is widely recognised in entrepreneurship research as a good predictor of entrepreneurial intentions, leading eventually to entrepreneurial actions and success in the venture creation process (see Newman *et al.*, 2019). Prior work focused on these positive effects and the ability of entrepreneurs to sustain high levels of self-efficacy, particularly during the early stages of new venture creation when they are confronted with mounting problems and high uncertainty, or when returning to entrepreneurship after initial failure.

Overconfidence, in turn, looks at potentially detrimental effects of high levels of self-efficacy. Strong beliefs in one's own capabilities, unjustified by the accumulated knowledge and experience, can create ambitions that are not realisable. They are mostly reflected in launching ill-prepared business ventures resulting in very high exit rates, often during the first two to three years of business operations (Cressy, 2006). Entrepreneurial overconfidence may thereby result in the loss of invested capital and effort on the part of founders, in addition to the negative psychological consequences of business failure (Jenkins *et al.*, 2014). Overconfident entrepreneurs tend to underestimate business setbacks (Trevelyan, 2008), which is reflected in the continuation of business against clear signals that it will not survive (Lowe and Ziedonis, 2006; Kappes and Sharot, 2015). Overconfidence is widely demonstrated among nascent and early career entrepreneurs who may overestimate their entrepreneurial skills while disregarding the market reaction and the strength of their competitors (Bolger *et al.*, 2008). It is often reflected in relying on intuition in taking decisions rather than on comprehensive market analysis (Musso *et al.*, 2022). Over time, with accumulated experiences in running a new business, their outcome expectations tend to become more realistic (Szerb

and Vörös, 2021). However, a large proportion of new entrants do not survive until they reach the early stage of maturity (Cressy and Bonnet, 2018). Newman *et al.* (2019) called for more work to link the construct of entrepreneurial overconfidence with self-efficacy which may lead to a more balanced view on the role of self-efficacy in entrepreneurship in general. This has been advanced by Drnovšek *et al.* (2010) who argue that entrepreneurs need to master self-protective capability to control negative thoughts, but at the same time control excessive positive thinking. Both negative and positive control beliefs can moderate the effects of self-efficacy.

According to the Theory of Planned Behaviour (Ajzen, 1991), self-efficacy is one of three determinants of Entrepreneurial Intentions, next to desirability and social norms. Self-efficacy and overconfidence are both positively related to entrepreneurial intentions, but overconfidence may lead to unrealistic ambitions which are less likely to be realised. Therefore overconfidence can be considered to be a determinant of unrealistic ambitions which may lead to the creation of a business which would otherwise (i.e. in the presence of more realistic self-efficacy levels) not have been created, and which may be more likely to lead to business failure.

National culture and entrepreneurship

Culture is typically understood as a system of common values and norms that guide behaviour for members of a given society (Granato *et al.*, 1996). The relationship between national culture and entrepreneurship is an emerging field within entrepreneurship research (Thurik and Dejardin, 2011), with most research in this area being conducted on the relationship between national culture and new business formation (e.g. Pinillos and Reyes, 2011; Morales-Alonso *et al.*, 2021). However, to date, limited research has been conducted on the effect of national culture on ambitious entrepreneurship and EOC.

National culture and ambitious entrepreneurship

A promising line of research investigates the differentiating impact of national culture on the ambitious segment of entrepreneurship versus traditional small business. Bosma *et al.* (2009) found that informal institutions, represented in their research by the perception of entrepreneurship, played a significant role in the low ambition segment, but not with regard to growth-oriented early-stage entrepreneurship. Relying on Global Entrepreneurship Monitor data, Autio *et al.* (2013) found that certain national-level cultural practices (societal institutional collectivism, performance orientation and uncertainty avoidance) differently affect two aspects of entrepreneurship, namely individual-level entrepreneurial entry rates and entrepreneurial growth aspirations.

The degree to which national culture impacts ambitious entrepreneurship has predominantly been examined at the entrepreneur level. Fayolle *et al.* (2010) offers a research framework for investigating the impact at the firm level, specifically the entrepreneurial orientation of firms (innovativeness, proactiveness, risk-taking). They noted that the assumption that culture-driven individual behaviour will be reflected in a firm's orientation may lead to oversimplification. Therefore, it is important to consider the moderating effects of industry and firm level cultures which may strengthen or weaken the impact of national culture on a firm's entrepreneurial orientation. In turn, Huggins and Thompson (2014) pointed to the critical role of the local community culture on entrepreneurship rates in general, particularly on the survival of new ventures (Huggins *et al.*, 2017).

Addressing the issue of the impact of national culture on the entrepreneurial orientation of small and medium-sized enterprises (SMEs), Kreiser *et al.* (2010) found that uncertainty avoidance and power distance negatively influenced risk-taking levels, whereas the same

culture determinants plus individualism negatively affected proactive behaviours of firms. Although between-country differences in entrepreneurial orientation are strongly linked to unique cultural attributes, the strength and direction of these influences depends on the level of the socio-economic development. The latter finding mirrors conclusions from the studies reported earlier on the impact of national culture on new business formation.

National culture, self-efficacy and entrepreneurial overconfidence

To date, limited research exists investigating the influence of national culture on entrepreneurial self-efficacy and overconfidence at the individual level. Wennberg *et al.* (2013) studied how national culture (institutional collectivism, uncertainty avoidance and performance orientation) moderates the impact of individuals' self-efficacy and fear of failure on entrepreneurial entry. Their results indicate that the positive effect of self-efficacy on entrepreneurial entry is being reinforced in countries where cultural values and norms favour institutional collectivism and have higher performance orientation. Surprisingly, a strong positive association between self-efficacy and entrepreneurial entry was present in countries inclined toward uncertainty avoidance. The authors noted that individuals with very strong beliefs in their own success may be "isolated" from influences of national culture.

As part of a broader study on the impact of performance-based versus socially supportive cultures on early-stage entrepreneurship entry rates in 40 countries, Stephan and Uhlaner (2010) found that a socially supportive culture has a more pronounced influence, as compared to the strength of formal institutions, on both general entry rates and on the quality segment of entrepreneurship. High social capital reflected in the friendliness and cooperativeness of the national culture positively influences individual's self-efficacy as well as the perception of the social desirability of entrepreneurship.

Cieślik *et al.* (2018) conducted a study which focused directly on the relationship between national culture and the level of EOC within the ambitious segment of entrepreneurship in the European Union member states. Drawing from the Hofstede (2001) framework they included masculinity, long-term orientation and uncertainty avoidance as culture-related variables. The study revealed, among other findings, that although entrepreneurial overconfidence, that is ambitions exceeding realisations, was found in almost all countries, the discrepancy was particularly wide among new EU member states entering the EU since 2004. One limitation of said study was that it included 23 European countries with a long history of trade, economic cooperation and cultural exchanges leading to substantial uniformization of natural cultures. The present study covers not only a larger (71 countries) but also a significantly more diversified (economically, socially and culturally) group of countries allowing for a more comprehensive investigation of the impact of national culture on EOC. Moreover, whereas Cieślik *et al.* (2018) studied ambitions of early-stage entrepreneurs regardless of their employment levels, the present study considers specifically the ambitions of solo entrepreneurs. As explained in the Introduction of this article, ambitions by solo entrepreneurs need to be studied separately from employer entrepreneurs' ambitions.

The relationship between national culture and EOC levels of solo entrepreneurs

Defining national culture

When it comes to defining national culture, one can draw upon a series of quotations presented by leading academics in cross-cultural research. One of the most cited definitions of culture derives from Hofstede who defines culture as "the collective programming of the mind distinguishing members of a group or category of people from others" Hofstede (1991, p. 21). Over recent decades societal culture has been measured in various ways with the cross-cultural value survey being the most popular comparison method employed (Hofstede, 1980,

2001; House *et al.*, 2004; Inglehart, 2000; Schwartz, 1994, 2006). When assessing national culture in relation to entrepreneurship, past studies have relied largely on the use of Hofstede's cultural framework (e.g. Hayton *et al.*, 2002; Mueller and Thomas, 2001; Tiessen, 1997; Wennekers *et al.*, 2007).

Hofstede's cultural framework

Hofstede's original research investigated the cultural orientation of IBM managers across 60 countries. From this he quantified four primary cultural dimensions: (1) Individualism versus Collectivism (IDV)—the degree to which a culture has a loosely-knit social framework (individualistic), or a tightly-knit social framework (collectivist) resulting in an "I" (individualistic) or 'we" (collectivist) perspective; (2) the Power-Distance index (PDI)—how accepting the less powerful members of a culture are in knowing that power is unequally distributed; (3) Masculinity versus Femininity (MAS)—the degree to which a culture values heroism, assertiveness and material rewards and where the society is fundamentally more competitive (masculinity), or where cooperation, modesty, quality of life and caring for others is seen as the preferred course of action making these cultures more consensus-oriented (femininity) and (4) the Uncertainty Avoidance index (UAI)—the degree to which a culture is uncomfortable with the unknown and ambiguity. Subsequent research using the World Value Survey saw Hofstede add two additional dimensions to his framework: (5) Long-Term versus Short-Term orientation (LTO) and (6) Indulgence versus Restraint (IND) (Hofstede *et al.*, 2010). Long versus Short- Term orientation refers to the time horizon people display; for example, long-term orientated cultures tend to be more pragmatic, thrifty and modest than short-term orientated cultures. In terms of Indulgence versus Restraint cultures, cultures classified as indulgent often are more encouraging of gratification of one's own emotions such as enjoying and having fun in life. In cultures that are more restrained, emphasis is placed on regulating emotions and behaviour where stricter emphases are placed on the social norms of the society.

The use of Hofstede's cultural dimensions has not been restricted to the field of cross-cultural management, but instead spans across international business, cross-cultural psychology, economics and entrepreneurship. However, despite its popularity, Hofstede's cultural framework is not without criticism (e.g. Minkov, 2018; McSweeney, 2002, 2009; Nakata, 2009). Researchers have questioned the sample used in the study, that comprises solely of IBM employees (Baskerville, 2003; McSweeney, 2002, 2009), the US-Centric nature of the data (Javidan *et al.*, 2006) and the labelling and validity of the cultural dimensions used (Minkov, 2018). Responding to these shortcomings, Beugelsdijk and Welzel (2018) collapsed Hofstede's six dimensions of national culture into a three-dimensional framework consisting of the dimensions (1) Collectivism-Individualism, (2) Duty-Joy and (3) Distrust-Trust outlined in the following section. Beugelsdijk and Welzel (2018) used a substantially larger and more culturally diverse sample (across 110 countries) than previously studied, demonstrating its value and reliability (Caza *et al.*, 2021). Drawing from this, we use Beugelsdijk and Welzel's (2018) updated framework (similar to Kara and Peterson, 2019) to access EOC at the country level. The relationships between the Hofstede indicators and Beugelsdijk and Welzel's (2018) indicators are depicted schematically in Table 1.

Hypotheses development

Collectivism-individualism and EOC. While maintaining the original name to some degree from Hofstede's dimensions, Beugelsdijk and Welzel (2018) combine Hofstede's Individualism versus Collectivism (IDV) and Power Distance (PDI) dimensions in their research, using the label *Collectivism-Individualism*. IDV captures traditional-collectivist values versus liberal-individualistic values, while PDI relates to the degree of acceptance and

expectation of a hierarchical structure within society (Hofstede, 2001). Beugelsdijk and Welzel (2018) include both dimensions within their Collectivism-Individualism dimension as IDV and PDI have been found to be empirically correlated. Conceptually, individualistic societies are those that prioritise the individual and orientate around "the self" with an emphasis on being independent/autonomous, instead of identifying with larger societal groups or being embedded within groups (Triandis and Gelfand, 2012). Individualistic cultures place importance on the independence of the individual, and people determine their own goals rather than seeking to fulfil the expectations of others, such as family and friends (Beugelsdijk and Welzel, 2018; Hofstede, 2001; Triandis, 1995; Welzel, 2013). Religion is less important in individualistic cultures, and children having responsibility is valued along with an individual's overall success. Both Brewer and Venaik (2011) and Beugelsdijk and Welzel (2018) find that individualism encompasses two aspects, one relating to family and friends, and another that is related to overall societal institutions. In contrast, people within collectivist cultures tend to be tightly knitted with their group of family and friends and regard relationships with others in their group as an important aspect of society. Collectivist cultures view their group membership as central to their self-identity (Moore *et al.*, 2018). Societies that are more traditional or collectivist tend to be religious, view obedience as an important quality in children, and view respect as an important aspect in a job (Beugelsdijk and Welzel, 2018).

When investigating the relationship between entrepreneurial overconfidence and collectivism-individualism at the country level, it is possible to draw conclusions from past literature on how a country's broader framework conditions impact on entrepreneurial behaviour and activities. Within international entrepreneurship literature at the macro level, the role of Collectivism-Individualism is mixed. For example, Shane (1992, 1993) reported a positive relationship between individualism and entrepreneurship when exploring the relationship between innovation and venture capital, while Aldrich and Waldinger (1990) found that higher levels of collectivism could positively contribute to entrepreneurial start-ups. Wennberg *et al.* (2013) found a positive effect of self-efficacy on entrepreneurial entry that is more pronounced in cultural landscapes that favour institutional collectivism while a recent study by Moore *et al.* (2018) concluded that a higher incidence of overconfidence in collectivist cultures was not supported by their findings. Cultures with a high level of individualism are associated with high self-efficacy levels (Klassen, 2004; VonDras, 2005). Moreover, this study argues that individuals who have higher self-efficacy are more likely to focus on success rather than failure, thus increasing their self-confidence. Therefore this research anticipates that entrepreneurs in individualistic cultures will report higher levels of overconfidence than their counterparts in collectivist cultures.

H1. There is a positive relationship between stronger Individualist (vs Collectivist) cultures and entrepreneurial overconfidence at the country level.

Table 1. Relationship between the indicators from two frameworks of national culture

Beugelsdijk and Welzel cultural indicators	Relationship with Hofstede's cultural values
Collectivism-Individualism	Higher levels of Collectivism-Individualism correspond with higher Individualism and lower Power Distance
Duty-Joy	Higher Duty-Joy correspond with higher Indulgence/Short-term Orientation and lower Restraint/Long-term Orientation
Distrust-Trust	Higher levels of Distrust-Trust correspond with lower levels of Uncertainty Avoidance

Source(s): Created by author, using data from Beugelsdijk and Welzel (2018) and Kara and Peterson (2019)

Duty-Joy and EOC. Beugelsdijk and Welzel's (2018) *Duty-Joy* dimension consists of a combination of Hofstede's Indulgent versus Restraint (IVR) and Long-Term Orientation (LTO) dimensions. Hofstede's definition of indulgence refers to societies that enjoy life, have fun and allow free gratification. In contrast, restraint refers to societies that suppress gratification needs by having strict societal norms. LTO relates to the time orientation of a culture and can be defined as the extent to which cultures focus on the future. LTO societies "prefer virtues oriented toward future reward, particularly perseverance, thrift, order of relation by status, and a sense of shame" (Guo *et al.*, 2018, p. 2). Beugelsdijk and Welzel (2018) note that countries that have lower scores on the Duty-Joy dimension (high-Duty) emphasise restraint and value the importance of hard work. Countries with higher scores (high-Joy), characterised by less restraint and more indulgence, tend to value imagination as an important quality in children, placing less value on future income. Cultures that display higher levels of Joy tend to be those for which the goal in life is to live for the moment (Beugelsdijk and Welzel, 2018).

Only one study investigates the relationship between Duty-Joy and entrepreneurship (Kara and Peterson, 2019). However, their empirical results indicate that Duty-Joy is not related to rates of entrepreneurship. Cieślik *et al.* (2018) found that LTO was negatively related to EOC as individuals who planned for the long term are inclined to have more realistic ideas about their future achievements. Therefore, it is likely that High-Duty cultures place emphasis on planning ahead, tend to be more pragmatic and rely on thrift and education to prepare for the future, attitudes which align more with reduced EOC. Hofstede *et al.* (2010) note that high-indulgence cultures tend to be more short-term orientated and thus individuals living in high-Joy cultures may be less likely to plan ahead for the future compared to high-Duty cultures. Although cultures with high levels of Joy may not automatically incorporate a short-term focus, it is likely that entrepreneurs in high-Joy cultures do not adequately plan for their venture and may not see the potential pitfalls of their endeavour due to their live in the moment approach. This lack of detailed future forecasting therefore may lead them to overestimate the future success of their business.

H2. There is a positive relationship between stronger Joy (vs Duty) cultures and entrepreneurial overconfidence at the country level.

Distrust-Trust and EOC. Beugelsdijk and Welzel's (2018) *Distrust-Trust* dimension draws upon Hofstede's Uncertainty Avoidance (versus Acceptance) (UA) dimension. UA is the extent to which cultures are comfortable with ambiguity (Hofstede, 2001). Beugelsdijk and Welzel's (2018) research indicates that high levels of UA within a culture correspond to greater degrees of Distrust, while lower levels of UA correspond more closely to Trust. The reasoning is that cultures that display high levels of UA tend to be more nervous and threatened by the unknown compared to cultures with low UA. High-UA cultures in general are less confident in unstructured situations which can lead to high levels of stress and anxiety. As such, Minkov and Hofstede's (2014) research found that both anxiety and stress were highly relevant within the UA dimension, echoing Venaik and Brewer's (2010) findings. Beugelsdijk and Welzel's (2018, p. 1484) note that "high levels of UA are associated with a large fraction of people saying that generally speaking you cannot trust people and need to be careful in dealing with people", hence the "Distrust-Trust" label. High levels of UA or Distrust are associated with a fear of failure, learning that the world is hostile, viewing the law as against society and preferring tasks with little risk (Beugelsdijk and Welzel, 2018).

As with the previous two indicators, limited research exists on Distrust-Trust and EOC. Past empirical research notes a correlation between low levels of uncertainty avoidance (UA) and the individual traits most commonly associated with entrepreneurs, such as risk taking (Hayton *et al.*, 2002; Mueller and Thomas, 2001). At the country level, Wennekers *et al.* (2007) found a positive link between UA and business ownership rates in OECD countries while

employing a multivariate regression framework controlling for economic development and other covariates. Canestrino *et al.* (2020) report a negative direct correlation between UA and country levels of social entrepreneurial activity. These results are in contrast with Kedmenec and Strašek (2017) and Puumalainen *et al.* (2015) who found no evidence of a link between UA and social entrepreneurship activities at the country level. Organisations situated in countries with high levels of Distrust are likely to also report high levels of Distrust at an organisational level. Decades of research exists on the impact of national culture on organisational culture within given countries, as it is reasonable to expect that the national culture (values, attitudes and beliefs) organically flow into the organisational culture. In high-Distrust organisations, it may be less likely that ambitious project ideas of creative employees will be pursued. In response, such creative employees may feel held back by the organisational culture and decide to pursue their idea on their own account and at their own risk by starting their own business (Acs *et al.*, 2013). Hence, in high-Distrust countries, a larger proportion of start-up ventures may involve the pursuit of innovative, high-risk projects that could otherwise have been pursued as an intrapreneur within an established organisation in high-Trust countries. This is because in high-Trust countries, management boards on average may be more willing to approve risky projects within the organisation (Wennekers *et al.*, 2007). As innovative projects are by definition more uncertain, the probability of overestimating the future success of the business is also higher.

To summarise, in high-Distrust cultures, a larger proportion of independent start-ups may involve more innovative and uncertain projects being pursued by creative individuals who feel constrained by the organisational culture of established firms in their country. The likelihood of overestimating one's own ability to overcome this entrepreneurial uncertainty (relative to starting a well-defined entrepreneurial activity such as, for example, a bakery or hairdressing shop) is also greater.

H3. There is a negative relationship between stronger Trust (vs Distrust) cultures and entrepreneurial overconfidence at the country level.

Data and methods

Measuring EOC: earlier approaches adopted in the literature

When measuring entrepreneurial overconfidence, researchers have been confronted with methodological challenges. At the individual level, measuring overconfidence, as unrealistic expectations of the effect of their entrepreneurial actions on expected positive outcomes, necessitates access to data on both projections and realised outcomes, so that entrepreneurs must be contacted at least twice. While conducting surveys and interviews among small business owners, this represented a barrier for many research studies, resulting in low response rates and prompting the use of alternative research techniques to circumvent this obstacle (Cieślik *et al.*, 2018).

Similar challenges confronted researchers focusing on country-level measurements of overconfidence. Koellinger *et al.* (2007, 2011) used data from the Global Entrepreneurship Monitor (GEM) and found evidence of a negative relationship between the ratio of established entrepreneurs to nascent entrepreneurs at the country level, and the percentage of a country's population that claimed to have sufficient skills, knowledge and experience to start a business. They interpreted this relationship as an indicator of entrepreneurial overconfidence.

Entrepreneurial ambitions do not necessarily reflect overconfidence, but in some cases may reflect self-efficacy. Consider a nascent entrepreneur expecting to break even in year 5 who does not break even until year 6. This ambitious assessment prompted him/her to start a business and despite some unexpected cashflow problems, the overall impact was positive.

Thus, a key bottleneck in measuring overconfidence is the determination of a base level of confidence reflecting self-efficacy, whereas beliefs and expectations more than the base line would represent overconfidence. Cieślik *et al.* (2018) attempted to resolve this issue by introducing a direct measure of EOC, using expectations of employment growth as a measure of entrepreneurial ambitions. Focusing on EU member states, they took from GEM the percentage of early-stage entrepreneurs in a country stating an ambition to employ at least five employees in five years' time and compared it with the percentage of firms that employ five employees or more in each country (sourced from Eurostat), where the latter was considered a realistic base line. Cieślik *et al.* (2018) defined the degree of entrepreneurial overconfidence (EOC) as the ratio of these two percentages, employment ambitions to employment realisations. This study builds on this methodological approach while extending the analysis to countries at low and intermediate stages of socio-economic development. The methodology aims to capture two types of cognitive biases in entrepreneurial thinking identified by Zhang *et al.* (2020). One cognitive bias emanates from the availability heuristic and is reflected in overconfidence in one's own knowledge. A second cognitive bias emanates from the representativeness heuristic when entrepreneurs tend to neglect general patterns of the entrepreneurial environment in their country or region (base-rate statistics) in favor of accidental personal information (Zhang *et al.*, 2020).

Measuring EOC: our approach

The measure of EOC of solo entrepreneurs in this study is calculated using data from the GEM survey, which measures entrepreneurial activity at both the micro and macro level for a large range of countries worldwide. The measure of overconfidence divides the hiring aspirations of early-stage solo entrepreneurs by the realised hirings of established entrepreneurs in each country [1]. The authors created the numerator of EOC, the hiring aspirations of early-stage solo entrepreneurs, as follows. For each country participating in GEM in a certain year, the authors selected from the country micro data set the subsample of early-stage entrepreneurs who have no employees [2], where early-stage entrepreneurs include both nascent and young business entrepreneurs (TEA, in GEM terminology) [3]. Within this subsample, the authors computed the percentage that expect to employ at least 1 employee in five years. Hence the numerator is the percentage of early-stage solo entrepreneurs that expect to transition to employer entrepreneurs within the next five years.

Regarding the denominator of EOC, the realised hirings of established entrepreneurs, the percentage of established entrepreneurs that currently employ at least one employee (i.e. the percentage of employer entrepreneurs) was computed. Established entrepreneurs are defined as owner-managers of businesses older than 42 months. In equation form EOC is expressed as follows [4]. The label EOC1+ was then used to indicate overconfidence levels in relation to the ambition of hiring at least one (1+) employee.

$$EOC1+(t) = \frac{\%\ of\ early\ stage\ solo\ entrepreneurs\ at\ time\ t\ expecting\ to\ employ\ at\ least\ 1\ employee\ at\ t+5}{\%\ of\ established\ entrepreneurs\ with\ at\ least\ 1\ employee\ at\ time\ t}$$

Although taking (just) one employee onboard may sound like a modest achievement, it is not. First, in the European Union about two-third of all self-employed operate without employees (Cieślik and Dvoulety, 2019), while this share is even higher in low-income countries (De Kok and Berrios, 2019). Second, as documented by Coad *et al.* (2017) and Fairlie and Miranda (2017), taking on the first employee represents a major threshold encountered by solo entrepreneurs when growing their businesses. This implicates additional costs (wages, social security costs) and administrative burdens (keeping payroll accounting, necessity to meet government standards regarding health and safety of the workforce, etc.). As additional employees are hired these costs and challenges grow at a disproportionately lower rate, but

particularly the first hiring is challenging. Indeed, as Coad *et al.* (2017) state: "The first hire constitutes the single biggest growth event facing any growing firm—it effectively corresponds to the challenge to solo entrepreneurs to double their workforce." (p. 25).

Many solo entrepreneurs are well aware of the risks and challenges related to taking on employees, and do not have the ambition to hire personnel. Van Stel *et al.* (2020) report that among a representative sample of solo entrepreneurs in Poland who were interviewed at the time of business start-up, only 34% indicated to foresee hiring employees at some point in the future of their new business, while 66% did not have such hiring plans. Hence, given our focus in this paper on overconfidence among *solo* entrepreneurs, the EOC1+ measure as defined above is particularly relevant.

Given the potential link between ambitions and realisations (Ajzen, 1991), it is interesting to investigate whether culture influences overconfidence related to higher ambition levels in the same way as more moderate ambition levels. Therefore, a similar measure relating to overconfidence levels regarding the ambition to hire at least six (6+) employees in five years' time was constructed:

$$EOC6+(t) = \frac{\%\ of\ early\ stage\ solo\ entrepreneurs\ at\ time\ t\ expecting\ to\ employ\ at\ least\ 6\ employees\ at\ t+5}{\%\ of\ established\ entrepreneurs\ with\ at\ least\ 6\ employees\ at\ time\ t}$$

As to the interpretation of these EOC measures, a value of 1 indicated that the expectations among early-stage solo entrepreneurs regarding their employment levels in five years' time (when their businesses will have reached the established stage – conditional on survival) matches the actual employment levels by current entrepreneurs whose businesses have already reached the established stage. The value of 1 is the benchmark level indicating realistic ambitions of a country's population of solo early-stage entrepreneurs [5]. A value higher than 1 indicates overconfidence in the sense that ambition levels of early-stage solo entrepreneurs (as a group) are higher than the realisation levels of entrepreneurs who have already reached the established stage.

Sample and model variables

2013–2016 was selected as the observation period [6]. For each country the average EOC level over this period was computed by a simple average of the annual EOC levels over 2013–2016, while taking account of the number of years a country participated in GEM [7]. The sample was further divided by gender to create four further variables, EOC1+ Male, EOC1+ Female, EOC6+ Male and EOC6+ Female [8].

The main independent variables used the country level cultural variables created by Beugelsdijk and Welzel (2018), Collectivism-Individualism, Duty-Joy and Distrust-Trust. Controls included country categorisations taken from the *GCR Global Competitiveness Report* by the World Economic Forum, CAT1 to CAT5, where CAT1 represents factor-driven economies, CAT2 represents economies that are transitioning from factor-driven to efficiency-driven, CAT3 represents efficiency-driven economies, CAT4 economies that are transitioning to innovation-driven and CAT5 are innovation-driven economies. The percentage of the Labour Force with Advanced Education (labelled Labour Force Education) and GDP growth, both sourced from the World Bank Development Indicators, and a measure of Labour Market Regulations sourced from the Fraser Institute (Fraser Institute, 2020) for each country were also included in the study [9]. These measures are also averaged over the years 2013–2016.

The various country category (CAT) variables control for economic development level. This study includes a measure of education, as more highly educated individuals may have more realistic assessments of their own skills and of the hurdles involved in realising entrepreneurial ambitions. The sign of education on EOC may thus be negative. Furthermore,

ambition levels as well as the realisation of ambitions may be influenced not only by informal institutions as measured by the culture indicators, but also by formal institutions. The authors considered employment ambitions, labour market regulations (LMR) to be particularly relevant, hence they are included as a measure of LMR. Finally, GDP growth may be positively related to EOC as individuals may be more optimistic in periods of high economic growth.

Descriptive statistics

Table 2 presents descriptive statistics for the variables and Table 3 presents the pairwise correlation coefficients between variables. The variance inflation factors (VIFs) for variables were calculated and all were below 10, therefore variance inflation is deemed of no concern in this case (O'Brien, 2007). Table 2 shows that on average, country levels of EOC for the ambition to employ (at least) one employee in five years' time are fairly moderate (1.14) although country differences clearly exist. Differences between men and women in EOC levels are small. Interestingly, when it comes to stronger ambitions of employing at least 6 employees five years from now, country level samples of solo entrepreneurs show much higher levels of EOC (around 1.9). As explained before, neutral or "realistic" ambitions correspond to a value of 1; hence, given the much higher country levels of EOC, it appears that, considering the group of early-stage solo entrepreneurs who express ambitions to employ at least 6 people in five years' time, a relatively high proportion of this group may not realise such ambitions. Table 2 also shows the majority of countries in the data sample are from the more highly developed categories of countries (Cat 4 and Cat5). Table 3 reveals negative correlations between EOC levels and Collectivism-Individualism (contradicting Hypothesis 1) and between EOC and Distrust-Trust (in line with Hypothesis 3).

Variable name	Obs	Mean	Std. Dev	Min	Max
EOC1+	71	1.142	0.267	0.75	2.3
EOC1+ male	71	1.138	0.230	0.72	2.03
EOC1+ female	71	1.180	0.365	0.69	2.66
EOC6+	71	1.901	1.218	0.53	8.83
EOC6+ male	71	1.864	0.969	0	5.864
EOC6+ female	71	1.913	1.316	0	7.749
Collectivism-Individualism	71	0.367	0.229	0	1
Duty-Joy	71	0.535	0.209	0.109	0.894
Distrust-Trust	71	0.364	0.165	0	1
GDP growth	71	0.026	0.028	−0.136	0.102
Labour Market Regulations	71	0.651	0.118	0.429	0.912
Labour Force Education	56	0.753	0.077	0.476	0.886
Cat1	71	0.099	0.300	0	1
Cat2	71	0.042	0.203	0	1
Cat3	71	0.282	0.453	0	1
Cat4	71	0.197	0.401	0	1
Cat5	71	0.380	0.489	0	1

Note(s): Descriptive statistics are presented for the dependent and independent variables. Higher values of the culture variables Collectivism-Individualism, Duty-Joy and Distrust-Trust indicate higher levels of Individualism, Joy and Trust respectively
Source(s): Created by author

Table 2.
Descriptive statistics

Table 3.
Correlation matrix

$n = 56$	1	2	3	4	5	6	7	8	9	10	11	12
1. EOC1+												
2. EOC6+	0.654***											
3. Collectivism-Individualism	−0.417***	−0.404***										
4. Duty-Joy	0.054	0.037	0.292**									
5. Distrust-Trust	−0.458***	−0.322**	0.230*	0.213								
6. GDP growth	0.07	0.166	−0.459***	−0.119	0.279**							
7. Labour Market Regulation	−0.156	−0.311**	0.219	−0.023	−0.0564	0.1083						
8. Labour Force Education	−0.006	−0.177	0.267**	0.330**	0.096	−0.162	0.022					
9. Cat1	0.015	−0.059	−0.329**	−0.101	0.268**	0.402***	0.119	−0.022				
10. Cat2	−0.071	−0.127	−0.109	−0.061	0.082	0.250*	0.039	−0.324**	−0.0374			
11. Cat3	0.363***	0.357***	−0.434***	−0.234*	−0.295**	0.044	−0.273**	−0.036	−0.160	−0.078		
12. Cat4	0.078	0.133	−0.108	−0.171	−0.219	0.046	0.0003	0.003	−0.152	−0.074	−0.317**	
13. Cat5	−0.373***	−0.361***	0.676***	0.419***	0.284**	−0.354***	0.166	0.128	−0.240*	−0.117	−0.500***	−0.476***

Note(s): Pairwise correlations coefficients are presented between the variables for a sample size of 56. * if $p < 0.10$, ** if $p < 0.05$, *** if $p < 0.01$
Source(s): Created by author

Results

OLS regressions was performed explaining cross-country variations in EOC levels. As the observations are country averages over the period 2013–2016, the authors effectively employ a panel data between-estimator [10]. Table 4 presents the results for three models. Model 1 includes variable Labour Force Education. However, due to limited data availability for this variable (see Table 2), its inclusion reduces the sample size. Therefore, in Model 2 the authors rerun the model for the same number of observations while excluding this control variable. As the results are not affected by this exclusion, it is considered that exclusion of this variable does not affect the analysis. Therefore, the study proceeded to run the model on the bigger sample size of 71 countries. The main results are in Model 3 and indicate a positive relationship between EOC1+ and Duty-Joy, significant at the 5% level and a negative relationship between EOC1+ and Distrust-Trust, significant at the 1% level. These findings support Hypotheses 2 and 3, respectively. Collectivism-Individualism is not significantly related to EOC and hence rejecting Hypothesis 1.

Table 5 shows the results of six estimation models, in each case using a different measure of EOC as the dependent variable. Separate measures were created of EOC for plans to hire at least 1 and 6 employees within 5 years for the full sample and then for male and female respondents separately, to identify possible differences by gender. Note that the first model of Table 5 repeats the last model of Table 4, this is the EOC1+ model for 71 observations.

When splitting the EOC1+ results by gender (see the third and fourth model in Table 5), it is noted that the results are qualitatively similar to Table 4 in the sense that both for men and women, Duty-Joy is significant and positively related to EOC1+ while Distrust-Trust is significant and negatively related to EOC1+, similar as the general results. It does seem though that for both of these cultural variables, the results (in terms of magnitude size) are somewhat stronger for females.

For ambitions relating to employing at least 6 people in five years' time, the results are qualitatively similar to those for 1+ ambitions [11]. However, the magnitude sizes of the coefficients are much bigger, indicating that cultural differences between countries are more

	(1)	*(2)*	*(3)*
Cat2	−0.185 (0.274)	−0.192 (0.258)	−0.3 (0.176)*
Cat3	0.011 (0.151)	0.011 (0.15)	−0.124 (0.108)
Cat4	−0.076 (0.154)	−0.076 (0.152)	−0.206 (0.118)*
Cat5	−0.14 (0.167)	−0.142 (0.163)	−0.263 (0.129)**
Collectivism-Individualism	−0.213 (0.23)	−0.209 (0.223)	−0.117 (0.184)
Duty-Joy	0.386 (0.175)**	0.39 (0.164)**	0.401 (0.15)**
Distrust-Trust	−0.762 (0.251)***	−0.761 (0.248)***	−0.747 (0.194)***
GDP growth	1.325 (2.082)	1.32 (2.058)	0.899 (1.187)
Labour Market Regulations	−0.226 (0.305)	−0.225 (0.301)	−0.373 (0.243)
Labour Force Education	0.035 (0.468)		
constant	1.455 (0.419)***	1.478 (0.284)***	1.651 (0.224)***
No. of observations	56	56	71
R^2	0.4194	0.4193	0.3736

Note(s): Three regression models were run using EOC1+ as the dependent variable, including Labour Force Education in Model 1 and excluding it in Models 2 and 3. Excluding this variables gave a larger sample size. This model is run with the same number of observations as in Model 1 for robustness to show that the main results are unaffected by a different sample size. Higher values of culture variables indicate higher levels of Individualism, Joy and Trust respectively. * if $p < 0.10$, ** if $p < 0.05$, *** if $p < 0.01$. Standard errors in parentheses

Source(s): Created by author

Table 4. Explaining EOC levels for ambitions to hire at least 1 employee

Table 5.
Explaining EOC levels for ambitions to hire at least 1 and 6 employees, for total sample and by gender

	EOC1+	*EOC6+*	*EOC1+ male*	*EOC1+ female*	*EOC6+ male*	*EOC6+ female*
Cat2	−0.3 (0.176)*	−1.579 (0.839)*	−0.298 (0.154)*	−0.374 (0.238)	−0.196 (0.681)	1.506 (0.867)*
Cat3	−0.124 (0.108)	−0.949 (0.515)*	−0.121 (0.094)	−0.121 (0.146)	0.576 (0.418)	−0.308 (0.531)
Cat4	−0.206 (0.118)*	−1.221 (0.563)**	−0.188 (0.103)*	−0.236 (0.16)	0.3 (0.457)	−0.742 (0.581)
Cat5	−0.263 (0.129)**	−1.523 (0.616)**	−0.228 (0.113)**	−0.318 (0.175)*	−0.09 (0.499)	−1.058 (0.636)
Collectivism-Individualism	−0.117 (0.184)	−0.27 (0.875)	−0.07 (0.16)	−0.257 (0.248)	−0.708 (0.71)	−0.919 (0.903)
Duty-Joy	0.401 (0.15)**	1.175 (0.713)	0.35 (0.131)***	0.559 (0.202)***	1.725 (0.578)***	0.627 (0.736)
Distrust-Trust	−0.747 (0.194)***	−2.489 (0.922)***	−0.66 (0.169)***	−0.96 (0.262)***	−1.621 (0.748)**	−2.253 (0.952)**
GDP growth	0.899 (1.187)	7.926 (5.649)	0.887 (1.034)	0.189 (1.603)	5.605 (4.583)	10.944 (5.831)*
Labour Market Regulations	−0.373 (0.243)	−2.037 (1.155)*	−0.3 (0.211)	−0.514 (0.328)	−0.465 (0.937)	−1.969 (1.192)
Constant	1.651 (0.224)***	4.553 (1.065)***	1.56 (0.195)***	1.873 (0.302)***	1.771 (0.864)**	4.434 (1.1)***
No of observations	71	71	71	71	71	71
R^2	0.3736	0.3163	0.3587	0.3872	0.2901	0.3759

Note(s): Regression models were run using EOC1+ and EOC6+ as the dependent variables, repeating each for male and female respondents. Higher values of culture variables indicate higher levels of Individualism, Joy and Trust respectively. * if $p < 0.10$, ** if $p < 0.05$, *** if $p < 0.01$. Standard errors in parentheses
Source(s): Created by author

strongly related to overconfidence levels relating to bigger ambitions (employing at least 6 people five years from now) than to overconfidence levels relating to smaller ambitions (employing at least one person within five years). Finally, it is noted that for 6+ ambitions, the positive relationship with Duty-Joy is completely determined by males, as for females, this relationship is non-significant.

Discussion

Using Global Entrepreneurship Monitor data for 71 countries over the period 2013–2016, the authors constructed a new country-level measure of EOC of solo entrepreneurs and related this to three recently developed indicators of national culture. No significant relationship was found between EOC and Individualism (versus Collectivism), but EOC levels were positively related to Joy (versus Duty), and negatively related to Trust (versus Distrust).

The positive relationship between EOC levels and the variable Duty-Joy supports Hypothesis 2. It may be the case that entrepreneurs in high-Joy cultures do not adequately prepare for their venture and do not see the potential pitfalls of their endeavour due to their short-term orientation. This lack of detailed future forecasting therefore may lead them to overestimate the future success of their business. The higher EOC levels in high-Joy cultures are even more pronounced when ambition levels of six prospective employees are considered, especially for males.

The negative relationship between EOC levels and the variable Distrust-Trust supports Hypothesis 3. It may be the case that in low-Trust (high-Uncertainty Avoidance) cultures, a higher proportion of independent start-ups may involve more innovative and uncertain projects pursued by creative individuals who feel held back by the organisational culture of established firms in their country (Wennekers *et al.*, 2007). Through the more risky nature of these projects, the likelihood of overestimating one's own ability of overcoming this entrepreneurial uncertainty is also higher. Again, the higher EOC levels in low-Trust cultures are even more pronounced when ambition levels of six prospective employees are considered.

The finding on Hypothesis 3 is in line with Wennberg *et al.* (2013) who, surprisingly, found that the positive association between self-efficacy and entrepreneurial entry is reinforced by a national culture of uncertainty avoidance. These authors speculated that individuals with self-efficacy in high-UA countries may isolate themselves from negative influences of cultural norms towards entrepreneurial activity. The finding in this study sheds new light on this debate and suggests that in high-UA (low-Trust) countries, individuals selecting into entrepreneurship have higher self-efficacy levels, and, by extension, higher levels of entrepreneurial overconfidence.

Cieślik *et al.* (2018) studied EOC levels of entrepreneurs more generally (rather than focusing on solo entrepreneurs) while using a (slightly) different measure of EOC and a different data source to construct the denominator of their EOC variable. They also used a different sample of countries limited to the European Union. Despite these differences, their results on culture are in line with this study's results in the sense that they found a positive link between Hofstede's Uncertainty Avoidance Index and EOC (similar to other negative link for Distrust-Trust) and a negative link between Hofstede's Long-Term Orientation and EOC (similar to the positive link for Duty-Joy).

The present paper introduced a new empirical measure for measuring overconfidence among solo entrepreneurs, based on the expected number of hirings in the coming five years. The authors distinguished between expecting to employ at least six and at least one employee. In both cases these expectations are compared to a norm related to the numbers of entrepreneurs that actually employ at least six or at least one employee in a given country. Despite the robustness of this approach, this methodology has some limitations, especially in relation to the overconfidence measure capturing expectations to hire at least one employee

(EOC1+). First, even though it was explained in the *Data and methods* section that for solo entrepreneurs it is far from straightforward to hire even just one employee, many early-stage entrepreneurs may not be aware of the challenges related to hiring employees. This may especially be the case for nascent entrepreneurs who are just preparing start-up but who have no actual business experience yet. Although they may have a notion that employing larger numbers of employees may be a challenge, they may feel that employing just one employee is not a big deal. Therefore, to an extent, it may be the case that the EOC1+ measure is not so much capturing entrepreneurial overconfidence but rather a form of naivety. That is, it is not necessarily the case that (a proportion of) nascent entrepreneurs overestimate their own capabilities, but rather that they are not aware of the challenges involved in hiring employees, even if just one employee.

Second, as De Kok and Berrios (2019) document, in low income and lower-middle income countries, more than half of total employment (which also includes wage-employment) concerns self-employment. Hence particularly in these countries, solo self-employment may be considered the norm, and even though the EOC measure takes account of this norm (through the denominator), one may argue that especially in developing countries where hiring people is rare, any early-stage solo entrepreneur who intends to hire people is almost by definition overconfident. Again, in such circumstances the EOC1+ measure is more likely to capture a form of naivety (i.e. a lack of awareness of the challenges involved in hiring even just a single employee) rather than actually capturing overconfidence.

Conclusion

This paper investigated country variations in entrepreneurial overconfidence (EOC) levels among solo entrepreneurs, while focusing on cultural determinants of EOC, in particular the levels of Collectivism-Individualism, Duty-Joy and Distrust-Trust. When EOC levels are overly high and expectations of entrepreneurial success are unrealistic, entrepreneurial ambitions, including job creation ambitions, may not be realised. Unrealised ambitions or business failure can have significant repercussions for individual solo entrepreneurs. They may incur financial costs such as the loss of their initial investment, but it may also have a negative impact on their mental health, Shepherd (2003) describes the personal grief of failed entrepreneurs. There can also be significant societal losses, such as the waste of government supports (financial and otherwise) offered to self-employed individuals before and during their business creation, but also supports such as debt counselling provided after business failure. There are also implications for the ecosystem that supports business start-ups. As well as government supports, banks, private equity and venture capital firms provide debt and equity financing and expertise to business founders. Although such lending is inherently risky and many business start-ups do not succeed, entrepreneurs with unrealistic ambitions will increase the losses for these investors, increasing the perceived risk of these investments as a whole, thereby raising funding costs for all. They may also potentially prevent those with more realistic ambitions from receiving crucial financing, and may make investors less likely to continue to provide funding and other supports in a particular market. Better screening of potential investees such as seeking better information about their ambitions or business plans may mitigate this issue, but this creates additional costs associated with information-gathering. There is indeed a risk that public support may actually reinforce overconfident behaviour, which calls for additional scrutiny of entrepreneurs applying for public support to eliminate those with excessively overconfident attitudes. This risk can be particularly harmful in countries with elements of an "overconfidence prone" culture. Therefore, it is important to know more about EOC levels of solo entrepreneurs in different countries, and the (cultural) determinants of these levels.

This study's results are generally in line with the conclusions by Torres and Augusto (2018) that the ways of stimulating entrepreneurship should be aligned with the cultural profile of a given country. This study's findings focusing specifically on overconfidence suggest that governments of countries with high levels of Joy (vs Duty) and low levels of Trust (vs Distrust) should be particularly aware that a considerable proportion of solo entrepreneurs with hiring ambitions in their countries may underestimate the costs and liability involved in taking on employees. These findings have implications for policy, particularly when designing targeted initiatives to encourage solo entrepreneurs to become employers, given the global trend that individuals increasingly enter into self-employment without employees.

This study is not free from limitations. First, given the lack of literature examining the relationship between EOC levels and cultural variables the authors' developed hypotheses using the existent body of knowledge in the area, which is at the early stage of development. By doing this, the study paves the path in theorising the relationship between EOC and the three new culture variables by Beugelsdijk and Welzel (2018). This study does not claim that the explanations regarding these relationships are exhaustive and suggest that future research should further investigate the integrative theory around these relationships. One avenue recommended by Valliere (2017) is to acknowledge the heterogeneity of the population of established and nascent entrepreneurs as to the ways national culture and institutional logics affect specific groups at the local level.

Second, as explained earlier, it is worthwhile to distinguish between solo and employer entrepreneurs when studying their EOC levels, as the ambitions of these two types of entrepreneurs are different. Empirically, this study introduces a new measure of EOC tailored towards the solo self-employed. However, the hypotheses derivation in Section 3 has used mostly theoretical arguments relating to the link between national culture and overconfidence of entrepreneurs in general, rather than relating specifically to solo entrepreneurs. Theory building would benefit from introducing theoretical arguments that relate specifically to EOC levels of *solo* entrepreneurs.

Thirdly, the measure of EOC uses expectations of employment growth to proxy overconfidence, but other measures of entrepreneurial success may also be explored, which may also be an area for future research. As an example, entrepreneurial overconfidence may also be measured in terms of entrepreneurs' intentions around the timeline for bringing products/services to market. Fourth and finally, we do not control for industry due to having too few observations by industry to create reliable EOC measures. However, hiring decisions may vary by the industry in which the solo entrepreneur operates; therefore studying EOC at the industry level could be a promising area for future research.

Despite these shortcomings, this paper makes important contributions to explaining overconfidence levels of (solo) entrepreneurs through cultural influences. As the hiring of employees can be a costly process (Coad *et al.*, 2017), it is important that entrepreneurs have realistic expectations of what it requires to hire employees. This is especially the case for solo entrepreneurs since they do not have experience of hiring their own employees. This paper addresses such issues at an aggregate level by exploring what factors explain country differences in overconfidence levels of solo entrepreneurs.

Notes

1. Although in the paper the authors measure ambitions and overconfidence levels in terms of employment aspirations, the authors are aware that several other ambition measures exist, such as turnover and profits, and that each measure has its own specificities (Hermans *et al.*, 2015).
2. This selection is based on the GEM question on the number of employees an entrepreneur currently employs in his or her business.

3. Young business entrepreneurs are owner-managers of businesses younger than 42 months.
4. The authors considered constructing separate EOC measures for nascent and young business entrepreneurs, but for many countries the numbers of micro-level observations (i.e. the number of solo nascent entrepreneurs and the number of solo young business entrepreneurs) would become too small to estimate EOC in a reliable manner.
5. Of course, at the individual level, it is still possible that numerous entrepreneurs are overconfident.
6. This is mainly based on data availability.
7. Not every country participated each year. In case a country participated only 1, 2 or 3 years, the authors computed the average over the number of available years.
8. For the male and female subsamples, the EOC indicators are based on smaller groups, making the measures somewhat less reliable than those for the entire sample of entrepreneurs.
9. Higher values of this variable correspond to less strict regulation.
10. When explaining EOC levels from indicators of national culture, we focus on explaining the cross-country variation in EOC, rather than the variations over time or "within" variations. This is because national culture changes only very slowly over time, and for a short, four-year period such as 2013–2016, national culture may be assumed constant. In contrast, national culture strongly varies across countries. Hence, the relevant source of variation to be exploited in the regression analysis is cross-country variation rather than over-time or "within" variation. Accordingly, the between-estimator (rather than, e.g. fixed effects) is the appropriate estimator for our model.
11. The coefficient for Duty-Joy in the second model (1.175), explaining EOC6+, is almost significant at the 10% level with a p-value of 0.104.

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