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Working Paper

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Ilmenau Economics Discussion Papers, No. 176

Provided in Cooperation with:
Ilmenau University of Technology, Institute of Economics

Suggested Citation: Stützer, Michael (2023) : Entrepreneurship culture: Aggregate trait or collective programming of the mind?, Ilmenau Economics Discussion Papers, No. 176, Technische Universität Ilmenau, Institut für Volkswirtschaftslehre, Ilmenau

This Version is available at:
https://hdl.handle.net/10419/271038

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Ilmenau Economics Discussion Papers, Vol. 28, No. 176

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April 2023

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ISSN 0949-3859

Entrepreneurship Culture: Aggregate Trait or Collective Programming of the Mind?

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Abstract

The answer is yes to both. For decades, research on entrepreneurship culture has relied on two competing theoretical foundations for the important concept of entrepreneurship culture. One camp views entrepreneurship culture as an aggregate of personality traits conducive for entrepreneurship. The other camp applies Hofstede's (1980) definition of culture as "collective programming of the mind" towards entrepreneurship (e.g., Beugelsdijk, 2007, Hofstede et al., 2004; Stephan and Uhlander, 2010). In this paper I present empirical evidence that measures of entrepreneurship culture reflecting both approaches explain entrepreneurial intentions and action. Entrepreneurship culture is thus both – an aggregate personality trait and a collective programming of the mind.

Introduction

Why do people become entrepreneurs? One of the most elusive determinants suggested is entrepreneurship culture. However, the scholarly literature remains divided on what entrepreneurship culture actually is. There are differences in the definition of entrepreneurship culture which passes into different measures. The empirical evidence remains inconclusive so that some even doubt that there exist a good measure for entrepreneurship culture (Hayton & Caccioti, 2013).

There are competing definitions of entrepreneurship culture in the literature. The first school of thought argues that entrepreneurship is an aggregate trait of the population (e.g., Obschonka et al., 2013; Beugelsdijk, 2007; Freytag & Thurik, 2007; Davidsson, 1995; This approach takes

an individualistic view on culture (McClelland, 1961), arguing that if more people in a geographic area exhibit entrepreneurial traits, more people in this place will choose an entrepreneurial career. At the geographic level this will show as a higher average in an aggregate trait score and a higher proportion of population as entrepreneurs compared to another region with less prevalent entrepreneurial traits.

As culture builds on traits, studies applying this definition, measure culture with individual psychological traits pro entrepreneurship. For example, Obschonka et al. (2012) measure entrepreneurship culture at the regional level with an entrepreneurial constellation of the Big Five Traits (high in extraversion, conscientiousness, openness; low in neuroticism and agreeableness) in the US. Davidsson (1995) and Davidsson and Wiklund (1997) use more specific traits such as achievement orientation, locus of control and need for autonomy to investigate regional variation in entrepreneurship in Sweden. Suddle et al. (2010) partly rely on variables capturing need for achievement from the WVS and other sources to explain national differences in entrepreneurship. In the related field on innovation, Beugelsdijk (2007) detects differences between entrepreneurs and non-entrepreneurs regarding preferences on equality versus freedom, individual responsibility or social welfare, attitudes towards to future (too name a few) to compute a composite score for regional entrepreneurship culture for European regions. In general these studies find positive effects of the culture measures on entrepreneurship at the regional and the national level.

The second school of thought argues that entrepreneurial culture is based on collective values. This view builds heavily on Hofstede (1980) definition of culture as "collective programming of the mind". In that sense, an entrepreneurial culture is the collective programming of the populace towards entrepreneurial values. This programming often takes place in early life phases (Hofstede et al., 2010) via the upbringing of children in ways that are consistent with these entrepreneurial values and attitudes. But also later on the repeated social contact of entrepreneurial-minded people can lead to the development of shared and agreed upon values pro entrepreneurship (Denzau and North, 1994). Once established culture has a normative influence on what is preferred, accepted or unaccepted behavior ultimately rewarding behavior preferred behavior and sanction unaccepted behavior. An entrepreneurial culture for instance accepts risk-taking and innovativeness encouraging individuals to start a business or to become self-employed.

Studies applying this collective programming of the mind view of entrepreneurial culture operate often at the national level trying to explain variation in national entrepreneurship rates with

the cultural dimensions developed by Hofstede and the Globe project (e.g. Stephan and Pathak, 2016; Stephan and Uhlaner 2010; Suddle et al., 2010; Wennekers et al., 2007; Hofstede et al., 2004; Acs et al., 1994). However, the results of these studies can fairly be summarized as inconsistent and inconclusive. Given this lack of consistent results, Hayton and Caccioti (2013, p.708) pessimistically state "that we can be less confident, rather than more, in the existence of a single entrepreneurial culture". At the regional level, the results seem to be a little bit more promising as recent work by Huggins and Thompson (2016) studying British regions suggests.

The aim of this paper is to *empirically* answer the question whether an entrepreneurial culture is an aggregate trait or a collective programming of the mind. Thus, I will not engage in a fruitless debate which school of thought has a theoretical edge over the other. In contrast, I'm convinced that both schools of thought are part of the puzzle why entrepreneurship rates differ over space. From the psychological literature there is good evidence that even the distal Big Five psychological traits impact occupational choice and (e.g. Zhao and Seibert, 2006; Brandstätter, 2011). What might be less known is that these traits are not evenly distributed over space but clustered (e.g. Rentfrow et al., 2008; Obschonka et al., 2013; Stuetzer et al., 2016). From the economic geography literature we have empirical and case studies showing (often indirectly) the importance of norms and informal institutions on occupational choice (e.g., Bauernschuster et al, 2013; Wyrwich, 2013; Glaeser, 2007; Saxennian, 1994).

For the empirical test I use data from the German SOEP and a BBC study containing data on individual traits, individual entrepreneurial intentions and behavior. In the empirical test I use an *individual* entrepreneurial personality profile based on the Big Five traits as indicator of the aggregate trait view of culture. I also aggregate the Big Five traits over the respondents of a region, providing a *macro* entrepreneurial personality profile of the region as indicator of the collective programming of the mind view of culture. I find that the individual as well as the macro entrepreneurial personality profile predicts entrepreneurial intentions and behavior. This strongly suggests that both views of culture matter.

Data

German data

I use data from the German Socio-Economic Panel (SOEP). The SOEP is a nationally representative dataset following respondents over time and capturing topics such as household composition, education, employment, income and well-being. For this research I will use the data from 2005 wave because only this wave has combined information on traits, entrepreneurial

intentions and behavior. I generally exclude all respondents who are unemployed, still in education or already in retirement. I also exclude all respondents under the age of 18 and 60 years or older as entrepreneurship is arguably a less relevant option for these age groups.

Entrepreneurial behavior is measured with a dummy variable indicating whether the respondent is self-employed thereby excluding those who are self-employed farmers (N = 9,382). Regarding entrepreneurial intentions, respondents were asked the question how likely it is that they become self-employed in the next two years (scale from 0% to 100% in steps of 10%-points). For this analysis I focus only on those who are in paid employment but exclude those who are already self-employed (N = 8,632).

One main explanatory variable is the entrepreneurial constellation of the Big Five traits at the individual level. In the SOEP 2005 wave respondents completed a 15-item version of the Big Five Inventory (BFI, John et al., 1991). Participants rated their personality characteristics using items such as "I see myself as someone who does a thorough job" (seven-point Likert scales: 1 = does not apply at all, 7 = fully applies). A detailed description of the scale and evidence for reliability and validity in the SOEP data is provided in in Donnellan and Lucas (2011) and Gerlitz and Schupp (2005) and. The means of the single Big Five traits were: extraversion M = 4.89 (SD = 1.12), conscientiousness M = 5.98 (SD = 0.87), openness M = 4.54 (SD = 1.16), agreeableness M = 5.41 (SD = 0.97), and neuroticism M = 3.88 (SD = 1.20). To quantify the entrepreneurial profile, I apply the procedure applied in previous studies (e.g., Obschonka et al., 2013; Stuetzer et al., 2016). The procedure computes for each trait the square difference of the actual individual value from the extreme values as endpoints of the distributions (theoretical reference profile with highest possible value in E, C, and O, lowest possible value in A and N). The squared differences for all five traits are then summed up. In a last step, the algebraic sign of this score is reversed with the effect that higher values in this personality profile reflect a better fit of each individual's personality profile with the theoretical reference profile.

The second main explanatory variable is the macro entrepreneurial personality profile at the level of planning regions (Raumordnungsregion = ROR). As the number of individual observations in the SOEP profile is too small to compute reliable estimates for the planning regions, I turn to a different data source applied in previous research (Fritsch et al., 2018; Obschonka et al., 2013). The underlying data source is an online personality test where respondents complete a Big Five test battery and add additional information such as age, gender and the current residence (N = 67,328). This data covers the time period from 2003 to 2015. For each of the respondents in Germany the individual personality profile was computed as described above.

Thereafter the arithmetic average of the individual profiles over the regions was computed, providing the measure of the macro entrepreneurial personality profile for each ROR. The sample sizes underlying the macro entrepreneurial personality profiles for each of the 97 RORs range from 142 respondents (Altmark) to 8,067 respondents (Berlin) (mean = 1,198; median = 785). Note that this macro entrepreneurial personality profile is based on data until 2015 while the dependent variables are from 2005. This is, however, a minor problem as personality traits at the individual level are relatively stable over time and at the regional level are unlikely to change in the absence of large migration flows between the regions.

I employ a standard set of control variables. At the individual level I control for age and its squared term, education in years and its squared term, gender, being a foreigner, whether the respondent was married or had a partner compared to being solo, income and occupational dummies. At the regional level I control for GDP, population density. I also include dummies for the higher spatial level of Federal States – thereby controlling for State fixed effects.

British data

In GB, we used a dataset collected between 2009 and 2011 with a large Internet-based survey designed and administered in collaboration with the British Broadcasting Corporation (BBC). This dataset includes the Big Five traits for the individuals measured with a 44 item battery. I again compute the individual entrepreneurial personality profile as described above. As the BBC dataset is much larger than the SOEP dataset, the BBC data can be used to compute the macro entrepreneurial personality profile for small geographical areas. Using a regional identifier for the current residence, I compute again the macro entrepreneurial personality profile by averaging the individual profile over the Local Authority Districts of the current residence (LADs). There are 375 LADs across the UK (based on spatial definitions from 2008; aggregating the London Boroughs to one LAD and excluding the Isles of Scilly because of its smallness). The macro entrepreneurial personality profile is then based sample sizes ranging from 76 respondents (Teesdale) and 59,773 respondents for London (mean = 1,113; median = 777). Note, that unlike in the German case, I use the same Big Five data for the individual and the macro entrepreneurial personality profile.

As in the German case I generally exclude all respondents who are unemployed, still in education or already in retirement, under the age of 18 or 60 years or older for the empirical analysis. The BBC data also contain information on the occupational status. For the analysis on occupational choice, I focus only on those who are either self-employed or in paid employment (N = 239,503). The dataset also contains a variable on entrepreneurial intentions. The respondents

were asked whether owning an own business would be important to them (scale from 1=unimportant to 5=very important). For the analysis on intentions, I focus only on those who are in paid employment (N = 202,222).

For the analysis of the British data I basically use the same control variables at the individual and regional level as for the German data.

Empirical results

Results for Germany

The empirical strategy for this analysis is to include both – the individual entrepreneurial personality profile and the macro entrepreneurial personality profile – in the same regression with individual entrepreneurship as dependent variable. If only the individual entrepreneurial personality profile has a positive association with the individual entrepreneurship indicators, the aggregate trait explanation of entrepreneurship culture dominates. Culture would be only relevant to the extent that there are relatively more persons with entrepreneurial traits in a region compared to other regions. If only the macro entrepreneurial personality profile has a positive association with the individual entrepreneurship indicators, the collective programming of the mind view of entrepreneurship culture dominates. In this case culture is something in the air independent from the individual traits of the people in a region. If both turn out to be associated with individual entrepreneurship indicators, both schools of thought are relevant in our discussion of entrepreneurship culture.

Table 1 and 2 display summary statistics and the correlations for the German and the British data. We start the analysis with the German data. Table 3 presents the regression analysis for the German case. Entrepreneurial intentions is an ordinal variable ranging from 0 to 100 in tens steps suggesting the use of ordered logistic regressions. In Model 1 I only include the individual entrepreneurial personality profile and the macro entrepreneurial personality profile. In Model 2, I present only the results for the control variables. In Model 3, the full model is displayed. Models 4-6 repeat this structure using OLS regressions instead of ordered logistic regressions. Regardless of model choice and controls, the individual entrepreneurial personality profile is a significant predictor of entrepreneurial intentions. The macro entrepreneurial personality profile is a significant predictor of intentions only in the absence of the controls. When entered with the controls the coefficient is not significantly different from zero, albeit positive.

In Table 4 I repeat the analysis with entrepreneurial behavior measured as being self-employed using logistic regressions. Again, Model 1 presents the results for the main explanatory variables, Model 2 for the controls and Model 3 for all variables. The analysis reveals similar results as for entrepreneurial intentions. The individual entrepreneurial personality profile is significant with and without controls (Model 1 and Model 3), while the macro entrepreneurial personality profile (contrary to the results in Table 3) is significant with controls (Model 3) but insignificant without controls (Model 1).

At first glance the above results suggests that aggregate trait view of culture dominates and that the collective programming of the mind of culture is not relevant. However, the literature on the regional persistence of entrepreneurship suggests that the relationship between past entrepreneurial activity and contemporary entrepreneurial activity is not uniform. Instead the relationship is stronger in regions with relatively high levels of entrepreneurial activity (e.g., Andersson and Koster, 2011; Fritsch and Wyrwich, 2014). The explanation of this empirical fact is, that only if regions have a strong entrepreneurial culture, the mechanism how entrepreneurial culture and entrepreneurial behavior mutually reinforce each other are fully at play. Thus, I apply quantile regressions to estimate the effect of the macro entrepreneurial personality profile on entrepreneurial intentions for different points of the distribution of the dependent variable (Fig 1a). The strongest effect of the macro entrepreneurial personality profile on entrepreneurial intentions can be found for the upper quartiles of the distribution. I repeat the same analysis with entrepreneurial behavior as dependent variable. However, due to the binary nature of the dependent variable, quantile regressions cannot that easily be applied. Instead a run an auxiliary logistic regressions with only the individual variables from which I predict residuals. These residuals represent that part of the variance in entrepreneurial behavior which cannot be explained by the individual variables. As these residuals are non-binary, they can be used as dependent variable at quantile regressions with the regional variables. Figure 1b shows that indeed the effect of the macro entrepreneurial personality profile on the non-explained residuals is stronger in the upper parts of the distribution.

Results for Great Britain

Now I turn to the analysis of the British data. Recall also that I use basically the same set of control variables as in the German case. The minor differences (e.g., migration background in Germany vs. ethnicity in the UK) are due to differences in the underlying questionnaires used. The results are displayed in Table 5 (entrepreneurial intentions) and Table 6 (entrepreneurial behavior) where Model 1 presents the results for the explanatory variables, Model 2 for the

controls and Model 3 for all variables. In the British case, the individual entrepreneurial personality profile and the macro entrepreneurial personality profile are both significant predictors for intentions and behavior with and without controls.

As in the German case, I also use quantile regressions to determine whether the effect of the macro entrepreneurial personality profile on entrepreneurial intentions and actions for different points of the distribution of the dependent variable (Fig 2a and 2b). The results show that the effect is indeed stronger in the upper quantiles of the distribution.

Summary and Conclusion

The aim of this paper was to investigate whether an entrepreneurial culture is an aggregate trait or a collective programming of the mind. I used an *individual* entrepreneurial personality profile based on the Big Five traits as indicator of the aggregate trait view of culture. Aggregated over the respondents of the regions, the *macro* entrepreneurial personality profile of the region was used as an indicator of the collective programming of the mind view of culture. The results reveal that both views of culture predict entrepreneurial intentions and action in the UK. In Germany, only the aggregate trait view measured by *individual* entrepreneurial personality profile predicted intentions and actions. However, a quantile regression analysis shows that in the UK as in Germany, the effect the *macro* entrepreneurial personality profile is not uniform but strongest for the upper tails of the distribution. This result is consistent with the findings of Fritsch and Wyrwich (2014) as well as Andersson and Koster (2011) showing that persistence in entrepreneurship over time is also strongest in regions with high entrepreneurial activity. Summarizing the results, it is important to stress that the same variable – the entrepreneurial personality profile – has a dual effect on entrepreneurship at the individual level and the regional level.

The results have implications for theory. Many papers in the field of entrepreneurial culture have become somewhat agnostic which view of culture they use and many papers are thin in theorizing how culture affects entrepreneurship. The empirical evidence presented here suggest that both views of culture matter. An entrepreneurial culture partly resides in the entrepreneurial personality of individual people but also has a collective component which is in the air. Theorizing on the effects of culture should thus account for the mechanisms how culture affects entrepreneurial behavior for both views of culture. The aggregate trait view on culture is a bottom-up approach and argues that entrepreneurial traits are a pre-disposition for entrepreneurial behavior. This pre-disposition affects early choices in school and leisure affecting later choices

at the labor market. For example people scoring high in the Big Five trait openness tend to be interested in different hobbies and subjects in school translating into switching jobs more often and working in industries/occupations that offer different tasks. These people thereby can acquire skill variety (Lazear, 2005) which is an important predictor for entrepreneurial behavior

The collective programming of the mind view is a top-down-approach which argues that an entrepreneurial culture manifests in certain norms that make entrepreneurial behavior more legitimate. People in such regions tend for example to be more responsive to entrepreneurial opportunities and fear less entrepreneurial failure (Stuetzer et al., 2014). Looking more at the processes which can arguably differ between both views of culture can help the scholarly community to understand how and why an entrepreneurial culture affects entrepreneurship.

The results in this paper also potentially offers one potential explanation why many studies investigating national differences in entrepreneurship rates fail to find consistent results. In these papers, usually the collective programming of the mind view of entrepreneurship is applied and subsequently culture scales from Hofstede or the Globe project are used. These scales usually are not build to capture the aggregate trait view of culture. The results of this paper however show that the aggregate trait view has the most consistent results in explaining differences in entrepreneurship (e.g. Stephan and Pathak, 2016; Stephan and Uhlaner 2010; Suddle et al., 2010; Wennekers et al., 2007; Hofstede et al., 2004; Acs et al., 1994). Thus, the measures used in these studies do not capture that part of entrepreneurial culture working purely at the individual level making it less likely to find the alleged positive effects of culture on entrepreneurship.

The presented results can also inform the more general debate what culture is. Hofstede (2010, p. 6) takes the position that “culture is learned, not innate”. He demarcates culture from individual personality and encourages social scientists to locate the border between both. In contrast, psychologists argue that aggregate personality traits can describe culture as a whole McCrae et al., 2005). The results of this paper shows that the macro personality of a region has an additional effect on entrepreneurship over the individual personality. This macro personality does not fall from heaven like manna. Instead there must be processes how macro personality differences emerge, persist and get expressed. Recent theorizing offer some models based on how individual personalities can translate into macro personality through selective migration and socialization (Rentfrow et al., 2008; Stuetzer et al., 2019). To my point of view, both processes have to do with learning. Socialization is learning to adapt to external factors and selective migration is the result of the learning process choosing a better person-environment fit.

Thus, our research program should not lie in separating the trait approach of culture from the collective programming of the mind approach, but look for the mechanism connecting both.

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Table 1: Descriptive statistics and correlations for the German case

	Variable	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13
1	entrepreneurial intention	9.42	22.19	1.00												
2	entrepreneurial behavior	0.09	0.29	0.30	1.00											
3	individual entr. Pers. Profile	-44.94	14.15	0.09	0.08	1.00										
4	macro entr. Pers. Profile	-19.49	0.43	0.03	0.03	0.02	1.00									
5	Education	12.56	2.70	0.09	0.12	0.11	0.09	1.00								
6	Age	41.43	9.99	-0.10	0.09	-0.03	-0.01	0.06	1.00							
7	Gender	0.53	0.50	0.07	0.08	0.12	0.00	-0.00	0.01	1.00						
8	Partner	0.76	0.43	-0.04	0.02	-0.03	-0.00	0.04	0.30	0.01	1.00					
9	Migration background	0.15	0.36	-0.01	-0.04	-0.06	0.09	-0.18	-0.08	0.02	0.01	1.00				
10	Income	16,346	30,936	0.01	0.10	0.06	0.03	0.14	0.08	0.01	-0.00	-0.05	1.00			
11	GDP	26.27	7.41	0.01	0.02	0.02	0.61	0.05	-0.01	0.01	0.00	0.15	0.05	1.00		
12	Unemployment rate	11.82	4.74	0.01	-0.01	-0.00	-0.40	0.04	0.02	-0.02	-0.02	-0.20	-0.05	-0.70	1.00	
13	Population density	518.14	736.37	0.02	0.02	0.04	0.25	0.08	0.02	0.00	-0.03	0.04	0.01	0.25	0.07	1.00

Table 2: Descriptive statistics and correlations for the UK case

Variable	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 Entrepreneurial intention	2.23	1.32	1.00														
2 Entrepreneurial behavior	0.11	0.31	0.39	1.00													
3 Individual entr. Pers. Profile	-20.28	6.21	0.16	0.07	1.00												
4 Macro entr. Pers. Profile	-20.66	0.39	0.07	0.05	0.07	1.00											
5 Age	37.52	11.08	-0.07	0.15	0.06	-0.03	1.00										
6 Gender	0.38	0.49	0.18	0.10	0.11	0.01	0.01	1.00									
7 Income	3.94	1.76	0.02	0.05	0.18	0.12	0.21	0.15	1.00								
8 White	0.91	0.28	-0.11	0.00	-0.02	-0.10	0.08	-0.01	0.02	1.00							
9 Asian	0.03	0.17	0.09	-0.00	0.01	0.07	-0.08	0.03	0.00	-0.57	1.00						
10 Mixed	0.02	0.14	0.03	-0.00	0.02	0.04	-0.05	-0.00	-0.02	-0.45	-0.02	1.00					
11 Black	0.01	0.10	0.07	-0.01	0.01	0.06	-0.03	-0.01	-0.02	-0.34	-0.02	-0.01	1.00				
12 High education	0.57	0.50	-0.03	-0.02	0.06	0.11	-0.11	-0.03	0.24	-0.06	0.08	0.01	0.01	1.00			
13 GDP	496	94.91	0.06	0.04	0.05	0.71	-0.04	0.01	0.17	-0.11	0.08	0.04	0.08	0.12	1.00		
14 Unemployment rate	5.19	1.27	-0.01	-0.04	-0.00	-0.19	-0.11	0.01	-0.06	-0.10	0.09	0.04	0.06	0.04	-0.20	1.00	
15 Population density	2114	2322	0.05	-0.00	0.04	0.45	-0.14	0.01	0.06	-0.18	0.14	0.07	0.12	0.13	0.49	0.57	1.00

Table 3: Regressions on entrepreneurial intentions for the German case

VARIABLES	(1) Ordered logit	(2) Ordered logit	(3) Ordered logit	(4) OLS	(5) OLS	(6) OLS
Individual entr. personality profile	1.259***		1.176***	1.527***		1.115***
	(0.046)		(0.042)	(0.222)		(0.214)
Macro entr. personality profile	1.098***		1.040	0.589***		0.252
	(0.035)		(0.035)	(0.204)		(0.195)
Years education		2.388***	2.235***		5.240***	4.672***
		(0.671)	(0.625)		(1.627)	(1.609)
Years education squared		0.538**	0.574**		-3.868**	-3.327**
		(0.153)	(0.162)		(1.693)	(1.672)
Age		1.727**	1.701**		1.210	1.028
		(0.394)	(0.392)		(1.600)	(1.606)
Age squared		0.357***	0.364***		-3.602**	-3.371**
		(0.081)	(0.084)		(1.505)	(1.514)
Gender: Male=1		1.644***	1.596***		2.360***	2.135***
		(0.098)	(0.092)		(0.383)	(0.370)
Dummy: Married or with partner=1		1.054	1.064		0.412	0.461
		(0.078)	(0.079)		(0.542)	(0.542)
Dummy: Migration background=1		0.937	0.948		0.074	0.167
		(0.091)	(0.093)		(0.573)	(0.572)
Income per household member		1.000	1.000		0.000	0.000
		(0.000)	(0.000)		(0.000)	(0.000)
GDP per head		0.979	0.944		-0.189	-0.414
		(0.061)	(0.065)		(0.437)	(0.458)
Unemployment rate		0.858	0.847*		-1.325*	-1.425*
		(0.081)	(0.080)		(0.700)	(0.719)
Population density		1.226*	1.239*		1.569**	1.598**
		(0.149)	(0.156)		(0.746)	(0.794)
Occupational dummies		Yes	Yes		Yes	Yes
Dummies for Ror		Yes	Yes		Yes	Yes
Observations	8,632	8,632	8,632	8,632	8,632	8,632
Pseudo R2 / R2	0.00469	0.0457	0.0474	0.0080	0.0495	0.0530

Robust standard errors in parentheses
All non-binary variables were z-standardized
Displaying odds rations for ordered logistic regressions and regression coefficients for OLS
*** p<0.01, ** p<0.05, * p<0.1

Table 4: Regressions on entrepreneurial behavior for the German case

VARIABLES	(1) logit	(2) logit	(3) logit
Individual entr. personality profile	1.374***		1.269***
	(0.057)		(0.057)
Macro entr. personality profile	1.062		1.075*
	(0.044)		(0.046)
Years education		2.312*	2.044
		(1.140)	(1.012)
Years education squared		0.463	0.520
		(0.220)	(0.248)
Age		4.307***	4.279***
		(1.854)	(1.818)
Age squared		0.286***	0.290***
		(0.119)	(0.118)
Gender: Male=1		1.599***	1.547***
		(0.125)	(0.119)
Dummy: Married or with partner=1		1.015	1.026
		(0.130)	(0.131)
Dummy: Migration background=1		0.990	1.007
		(0.106)	(0.110)
Income per household member		1.000***	1.000***
		(0.000)	(0.000)
GDP per head		1.031	0.973
		(0.078)	(0.072)
Unemployment rate		1.096	1.076
		(0.127)	(0.123)
Population density		0.630*	0.620*
		(0.158)	(0.157)
Occupational dummies		Yes	Yes
Regional dummies		Yes	Yes
Observations	9,382	9,313	9,313
Pseudo R-squared	0.0102	0.182	0.186

Robust standard errors in parentheses
All non-binary variables were z-standardized
Displaying odds rations
*** p<0.01, ** p<0.05, * p<0.1

Table 5: Regressions on entrepreneurial intentions for the UK case

VARIABLES	(1) Ordered logit	(2) Ordered logit	(3) Ordered logit	(4) OLS	(5) OLS	(6) OLS
Individual entr. personality profile	1.319***		1.303***	0.172***		0.151***
	(0.010)		(0.009)	(0.006)		(0.006)
Macro entr. personality profile	1.115***		1.044***	0.072***		0.026***
	(0.037)		(0.009)	(0.022)		(0.005)
Age		0.551***	0.590***		-0.432***	-0.388***
		(0.038)	(0.042)		(0.035)	(0.036)
Age squared		1.338***	1.234***		0.265***	0.217***
		(0.101)	(0.096)		(0.039)	(0.040)
Gender: Male=1		1.582***	1.525***		0.288***	0.264***
		(0.014)	(0.014)		(0.007)	(0.007)
Income = 2		0.988	0.953**		-0.009	-0.030**
		(0.019)	(0.018)		(0.012)	(0.012)
Income = 3		0.872***	0.818***		-0.087***	-0.123***
		(0.017)	(0.016)		(0.012)	(0.012)
Income = 4		0.858***	0.792***		-0.095***	-0.139***
		(0.018)	(0.017)		(0.013)	(0.013)
Income = 5		0.847***	0.773***		-0.104***	-0.155***
		(0.022)	(0.021)		(0.015)	(0.017)
Income = 6		0.879***	0.785***		-0.078***	-0.141***
		(0.021)	(0.019)		(0.015)	(0.015)
Income = 7		1.065**	0.917***		0.046**	-0.041**
		(0.031)	(0.027)		(0.018)	(0.020)
Ethnicity Dummy: White=1		0.737***	0.745***		-0.200***	-0.189***
		(0.039)	(0.038)		(0.037)	(0.036)
Ethnicity Dummy: Asian=1		2.011***	2.041***		0.481***	0.488***
		(0.177)	(0.173)		(0.058)	(0.054)
Ethnicity Dummy: Mixed=1		1.123***	1.102**		0.084***	0.075***
		(0.050)	(0.049)		(0.029)	(0.028)
Ethnicity Dummy: Black=1		2.867***	2.815***		0.708***	0.691***
		(0.114)	(0.115)		(0.026)	(0.028)
Dummy: Bachelor degree or above=1		0.914***	0.904***		-0.057***	-0.063***
		(0.009)	(0.009)		(0.006)	(0.006)
GDP per head		0.987	0.971**		-0.007	-0.017**
		(0.012)	(0.012)		(0.007)	(0.007)
Unemployment rate		0.981*	0.997		-0.011*	-0.002
		(0.011)	(0.011)		(0.007)	(0.006)
Population density		0.959***	0.935***		-0.026***	-0.040***
		(0.015)	(0.014)		(0.009)	(0.009)
Constant				2.063***	2.258***	2.328***
				(0.017)	(0.039)	(0.038)
Occupational controls		Yes	Yes		Yes	Yes
Regional dummies		Yes	Yes		Yes	Yes
Observations	202,222	202,222	202,222	202,222	202,222	202,222
Adjd. R2 / Pseudo R2	0.00948	0.0398	0.0465	0.025	0.105	0.120

Robust standard errors in parentheses
All non-binary variables were z-standardized
Displaying odds rations for ordered logistic regressions and regression coefficients for OLS
*** p<0.01, ** p<0.05, * p<0.1

Table 6: Regressions on entrepreneurial behavior for the UK case

VARIABLES	(1) Logit	(2) Logit	(3) Logit
Individual entr. personality profile	1.273***		1.184***
	(0.009)		(0.009)
Macro entr. personality profile	1.153***		1.092***
	(0.015)		(0.018)
Age		6.414***	6.709***
		(0.606)	(0.648)
Age squared		0.264***	0.252***
		(0.025)	(0.024)
Gender: Male=1		1.397***	1.371***
		(0.028)	(0.029)
Income = 2		0.654***	0.639***
		(0.024)	(0.024)
Income = 3		0.473***	0.454***
		(0.029)	(0.028)
Income = 4		0.459***	0.435***
		(0.036)	(0.035)
Income = 5		0.501***	0.472***
		(0.040)	(0.038)
Income = 6		0.558***	0.519***
		(0.043)	(0.041)
Income = 7		0.850	0.768**
		(0.099)	(0.091)
Ethnicity Dummy: White=1		0.925**	0.934*
		(0.035)	(0.035)
Ethnicity Dummy: Asian=1		1.168*	1.175*
		(0.106)	(0.103)
Ethnicity Dummy: Mixed=1		1.051	1.038
		(0.069)	(0.069)
Ethnicity Dummy: Black=1		0.947	0.931
		(0.057)	(0.057)
Dummy: Bachelor degree or above=1		1.030	1.021
		(0.020)	(0.020)
GDP per head		0.956*	0.922***
		(0.025)	(0.022)
Unemployment rate		0.904***	0.931***
		(0.022)	(0.022)
Population density		0.957	0.923***
		(0.032)	(0.029)
Constant	0.110***	0.094***	0.101***
	(0.002)	(0.006)	(0.006)
Occupational dummies		Yes	Yes
Regional dummies		Yes	Yes
Observations	239,503	239,503	239,503
Pseudo R-squared	0.0107	0.167	0.171

Robust standard errors in parentheses
All non-binary variables were z-standardized
Displaying odds rations
*** p<0.01, ** p<0.05, * p<0.1

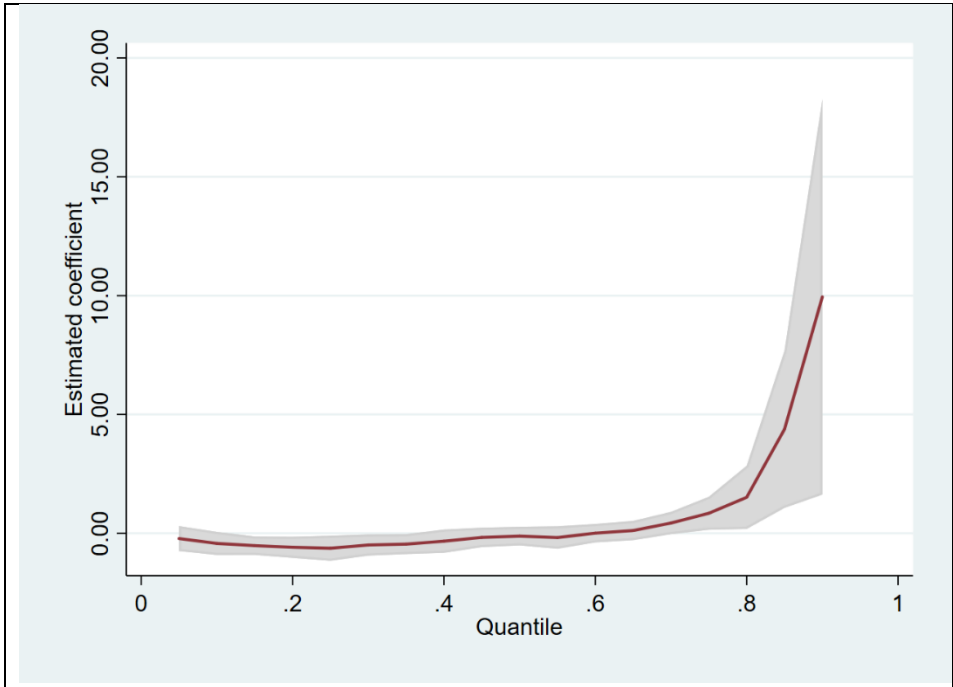

Figure 1a: Entrepreneurial intentions and culture in Germany

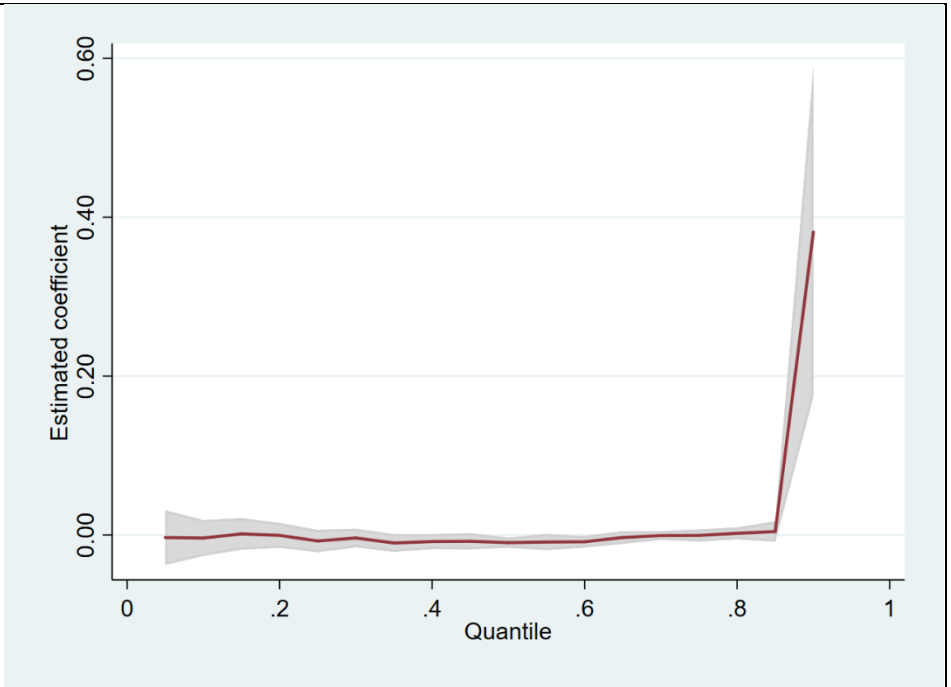

Figure 1b: Entrepreneurial behavior and culture in Germany

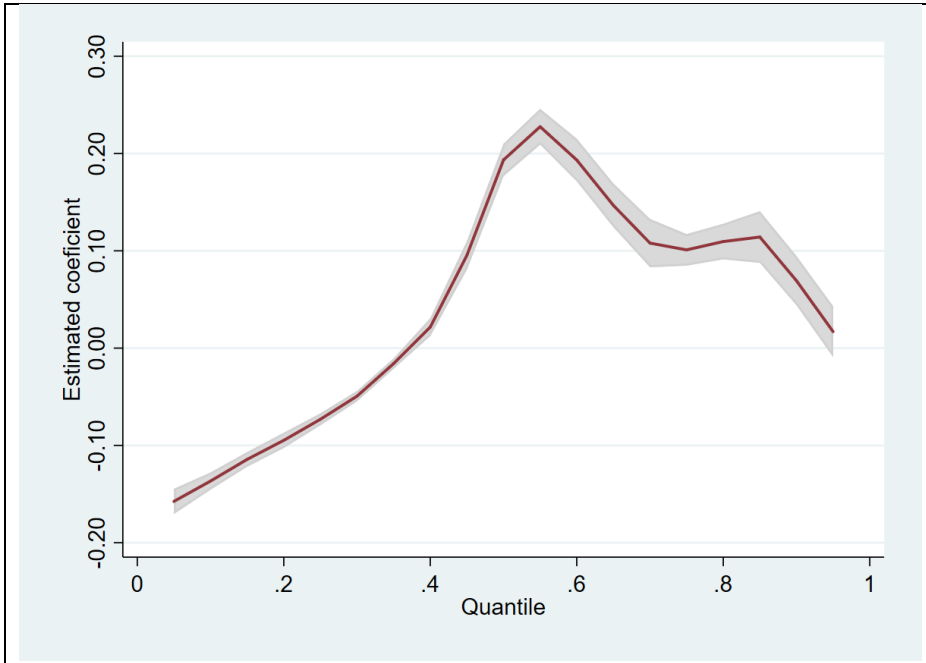

Figure 2a: Entrepreneurial intentions and culture in UK

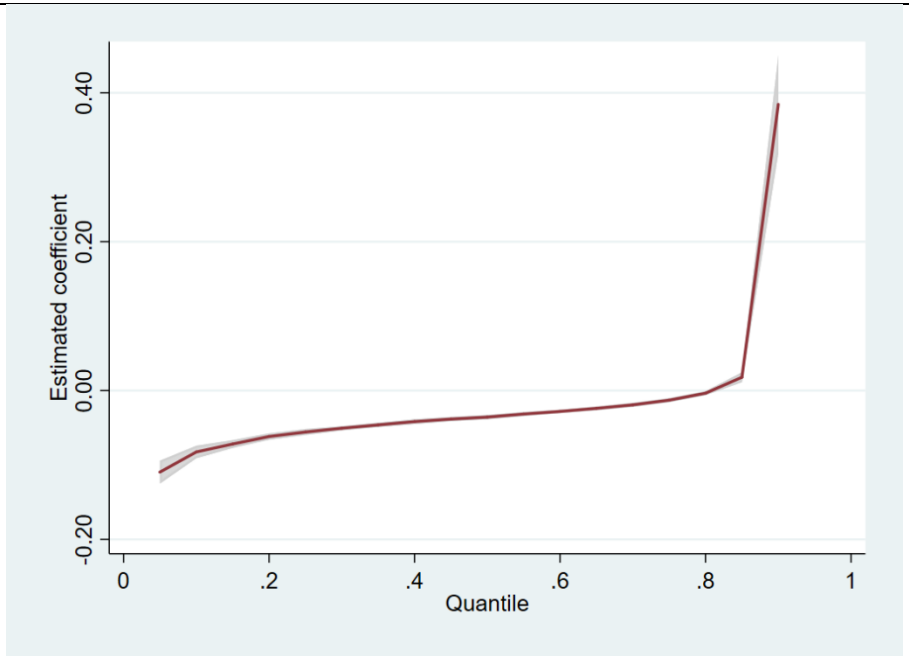

Figure 2b: Entrepreneurial behavior and culture in UK