Cultural Diversity and Employment Growth:

Moderating Effect of the

Recent Global Financial Crisis

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Keywords: Cultural diversity; firm performance; Global Financial Crisis (GFC)

JEL: M14; M51; E24; G01

Cultural Diversity and Employment Growth: Moderating Effect of the Recent Global Financial Crisis

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Abstract

This paper analyses the effect of cultural diversity on employment growth, considering the recent Global Financial Crisis (GFC) as a moderating factor. In doing so, we developed competing hypotheses based on Blau's theory of heterogeneity versus an alternative perspective which combines the resource-based view (RBV) with social identity theory (SIT). We empirically test such theories using a unique longitudinal dataset comprising the population of all firms in Sweden between 2003 and 2012. We find support for the latter hypothesis, i.e. the relationship between cultural diversity and employment growth is inverted U-shape, which is even more pronounced during/after the GFC. We discussed the implication of findings for other contexts.

1. Introduction

The aim of this paper is to investigate the relationship between cultural diversity and employment growth of firms before and after the Global Financial Crisis (GFC). Employment growth is not only of utmost importance for the economy in general. It is also a strong indicator for the management's expectation about the future performance of the firm, due to the costs and risks involved in laying-off and hiring new staff. Even more importantly, in a time of crisis, the future performance of a firm directly relates to its adaptability to the changes in the competitive landscape. Firm adaptability (or flexibility) is the agile response to radical environmental change and thus crucial for firms to remain competitive in volatile times (Farnese et al, 2016). Despite plentiful studies on diversity in the workforce as well as on the relationship between diversity and team, firm, and innovation performance in general (cf. Härtel, 2004; D'Netto et al, 2014), there is, to the best of our knowledge, a lack of studies that systematically and explicitly deal with cultural diversity in relation to the adaptability of firms. This is important for at least three reasons. First, generally speaking, selection environments change in the long-run and practically all firms need to adapt to these changes, if they want to stay, survive and thrive. Second, studying the effect of cultural diversity is important for any advanced economy such as Sweden or Australia due to massive immigration trends lately. This is particularly relevant in the Swedish case, since Sweden has been one of the most generous countries in terms of intake of refugees and immigrants irrespective their qualifications, while the integration and 'usefulness' of such inflow of newcomers to the Swedish labour market is still debated. In such a situation, it would be particularly interesting to investigate whether cultural diversity contributes to higher performance of firms, and if yes, how. Third, studying the effect of cultural diversity is important for any advanced economy, particularly in the crisis time (i.e. volatile environment). This is due to the fact that many advances economies were hit hard by the GFC in 2008 as a consequence of the interdependencies between advanced economies on global markets.

In studying the cultural diversity, the management literature dominantly follows Blau's theory of heterogeneity (1977) according to which homogeneous and highly diverse firms should perform better than firms with a medium degree of diversity. Advancing an alternative perspective, we argue that combining the resource-based-view (Barney, 1991; Ali et al, 2011) with social identity theories (Knouse and Dansby, 1999) suggests the opposite, i.e. that introducing diversity to a homogeneous group should increase performance whereas too much diversity may lead to the formation of sub-groups that hinder communication across groups and

induce conflict. Moreover, we discuss how fundamental changes[1] in the competitive landscape (e.g. the external shock induced by the GFC) affect the relationship between cultural diversity and firm performance.

Empirically, we test these competing theoretical arguments with a unique longitudinal dataset comprising 1,384,856 observations of 264,433 firms covering the population of Swedish firms from the years 2003 to 2012. The GFC in 2008, being one of the most severe crises since the Second World War, is treated as an exogenous event for firms in Sweden that has changed the economic landscape, increased uncertainty and volatility[2]. As firm adaptability is a more pressing need in and after the crisis as compared to before the crisis, the difference in the relationship between cultural diversity and employment growth between these two periods can be attributed to firm adaptability. Our empirical results provide convincing evidence that the relationship between cultural diversity and employment growth follows an inverted U-shaped curve as predicted by a combination of the resource-based-view and social identity theories. Furthermore, the results suggest that the effects of cultural diversity on employment growth are more pronounced during and after the crisis than in the period before the crisis.

The contributions of the paper are both theoretical and empirical. Theoretically, we challenge Blau's theory of heterogeneity, which dominates the literature on cultural diversity. Blau's theory predicts a U-shaped relation between diversity and firm performance. We develop a counter-argument by combining the resource-based view (RBV) with social identity theory (SIT). This argument posits an inverted U-shaped relation between diversity and firm performance. Moreover, we advance the theorizing by incorporating the role of a relevant external factor, i.e. the occurrence of the GFC, into the relation between diversity and firm performance. Empirically, the paper contributes to the literature by providing a rare systematic study of the 'population' of all firms in Sweden over a long period of time spanning before and after the GFC. We also employed various estimation techniques to provide as robust evidence as possible. Such a robust finding is not only relevant in the context of Sweden, which was a subject of a severe GFC hit (Österholm, 2010), but also for other similar countries that were hit by the GFC or may be hit in future by similar external shock to the economy.

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[1] Fundamental environmental change does not refer to industrial change where progression along learning curves lead to an increased organizational efficiency. Also, it does not refer to changes introduced through incremental innovations along an existing technological path.

[2] The crisis is exogenous because it hit Swedish firms regardless of their degree of cultural diversity and hence a reverse causality, i.e. the influence of Swedish firms on the crisis, can be safely ignored.

The paper proceeds as follows: In section 2, we elaborate on the theoretical arguments by defining cultural diversity, discussing the relationship between cultural diversity and firm performance in general and in the context of fundamental environmental changes. Section 3 presents the empirical study and section 4 discusses the findings and concludes the paper.

2. Theory development

2.1. Cultural diversity

Culture is a complex, multi-dimensional and evolving social construct that captures interdependencies between social structure and human agency. Culture has been defined in many, often contradictory ways, as unveiled in Jahoda's (2012) reflection on recent definitions. This paper follows the classic definition of Kroeber and Kluckhohn (1952 p. 181): "Culture consists of patterns, explicit and implicit, of and for behaviour acquired and transmitted by symbols, constituting the distinctive achievement of human groups, including their embodiments in artifacts; the essential core of culture consists of traditional (i.e., historically derived and selected) ideas and especially their attached values; culture systems may, on the one hand, be considered as products of action, on the other as conditioning elements of further action."

Conceptualized in this way, culture is viewed to shape the behaviour of individuals and – at the same time – is subject to change resulting from individual agency. Culture relates to distinct human groups and is produced and re-produced through interactions between individuals belonging to the respective groups. Evolving with social interactions and interactions with the natural environment, culture distinguishes one human group from another. In line with this perspective, Hofstede (1984 p. 21) defines culture as "the collective programming of the mind which distinguishes the members of one human group from another."

Most individuals belong to several human groups at the same time or, over time. They also change their human groups because of for instance migration, job changes, or marriage. Due to this plurality of belonging, each individual has an idiosyncratic "cultural heritage" which in turn preconditions cultural diversity within organisations. While an organisation is a human group breeding a specific culture, i.e. an organisational culture, individuals belonging to the organisation carry their own cultural heritage, giving raise to cultural diversity within a firm. Cultural diversity at the level of an organisation can thus be understood as the extent to which the cultural heritage of the individuals belonging to the organisation differs from each other.

Moreover, it has been argued that such cultural diversity in human capital serves as a source of sustained competitive advantage for organizations because it creates value that is both difficult to imitate and rare (Richard, 2000).

2.2. Cultural diversity and firm performance

It should be acknowledged that cultural diversity has both positive and negative effects on decision-making, and hence firm performance. On the one hand, variegated perspectives, ideas and breath of information, which often comes with diversity in groups, contribute to the quality of decisions (Cox and Blake, 1991; Grant, 1996; McMahan et al, 1998; Richard et al, 2007). Moreover, a firm is better able to serve its culturally diverse customers with a similarly culturally diverse workforce (Richard, 2000). On the other hand, cultural diversity can introduce affective conflicts with negative implications on decision-making and firm performance (Herring, 2009). Such negative effect of diversity is mostly stated in social identity theories (SIT) (Williams and O'Reilly, 1998). According to SIT, individuals mostly identify, build, and maintain relationships with others who are similar to them in social category memberships. Whether positive or negative effects dominate depends on mediating factors such as communication, task routines, or group longevity (Maznevski, 1994, Pelled et al., 1999). Moreover, SIT suggests that cultural diversity may lead to segregation within firms and consequently reduces information flows and increases competitive behaviour between subgroups, prejudice, discrimination, and conflict. However, the literature on social identity has also shown that the negative effects associated with cultural diversity can be overcome by e.g. promoting relations, integration and learning between the subgroups (Brickson, 2000, Ely and Thomas, 2001). All in all, it seems that the relation between diversity and firm performance is far from being linear, at least in the short-run (Richard et al, 2007).

When it comes to the exact relation between diversity and firm performance, the literature opens up for two alternatives. This section discusses the theoretical arguments supporting a U-shaped versus an inverted U-shaped relationship. The discussion builds on a recent paper by Haans et al. (2016), who provide a conceptual framework for identifying the underlying mechanisms of U-shaped and inverted U-shaped relationships based on review of 110 articles published in SMJ from 1980 to 2012. They argue that such relationships result from the combination of "benefit" and "cost" functions, which require explicit theoretical treatment. Starting from the first alternative, Blau's theory of heterogeneity (1977) proposes a curvilinear U-shaped relationship between diversity and social interactions and eventually firm performance. Since homogeneous groups (zero diversity) do not have cultural barriers to social action, positive social relations

and learning opportunities develop. This is reflected in the positive intercept of a linearly increasing benefit curve of cultural diversity, as a latent function. As regards the cost function, Blau's theory of heterogeneity predicts that the barriers to social interaction, particularly discrimination against out-groups, increase with heterogeneity. Again following Haans et al. (2016), this cost of cultural diversity can be conceptualised as a logarithmically increasing latent function, which is due to barriers to social interaction. Therefore, by jointly considering the two countervailing forces (negative and positive effect of diversity), one can expect the following: (i) when there is no diversity, firm performance is high as the communication between the members of homogeneous groups is not subject to cultural barriers, (ii) then as soon as diversity is increased, the performance starts to fall until a tipping point is reached, (iii) where it starts to raise again. The particular reason for the existence of such a tipping point is that minorities will become less obvious with increasing diversity, which in turn reduces discrimination against out-groups, therefore again leading to increasing the chances of social contacts between members of different groups (Blau, 1977: 80). The combined result of the discussed mechanisms is a U-shaped relation between cultural diversity and firm performance. This is shown in Figure 1A. Earley and Mosakowski (2000) empirically investigated the effects of team heterogeneity on effective performance and found that homogeneous and highly heterogeneous teams performed better than moderately heterogeneous teams. This provides support for a U-shaped relation between diversity and performance.

An alternative approach to Blau rests on the combination of the resource-based view (RBV) and social identity theory (SIT). First of all, according to the resource-based view, intangible and socially complex resources such as employee diversity are a better source of sustained competitive advantage than tangible resources such as scale of operations (Barney, 1991; Ali et al, 2011). Therefore, cultural diversity would lead to higher firm performance over time. Following Haans et al (2016), this can be seen as the "benefit" of cultural diversity, i.e. a linearly increasing latent function, which is due to intangible resources inherent in cultural diversity. Note that the theory does not predict a positive performance when diversity is zero; hence there is no intercept in the curve (unlike in Figure 1A). On the other hand, by increasing cultural diversity within a firm, its members may begin to organise themselves in groups with similar identity, cultural or ethical backgrounds. This is in line with the predication of SIT theory as this self-identification generates the inter-group dynamics within a firm that, in turn, produce undesirable employee behaviour such as decreased communication between groups (Kravitz, 2003) and increased conflict. Following Haans et al (2016), this can be seen as the "cost" of

cultural diversity, i.e. an exponentially increasing latent function, which is due to self-identification and inter-group dynamics. Therefore, by jointly considering the two countervailing forces (negative and positive effect of diversity), one can expect, a 'tipping point' in the diversity-performance relation, i.e. after reaching a certain level of diversity within a firm, the negative effect of diversity outweighs the positive effect and the result is an inverted U-shaped relation between cultural diversity and firm performance. This is shown in Figure 1B. There are several empirical studies that found such inverted U-shaped relation. For example, Knouse and Dansby (1999) found that 11–30% diversity levels were optimal in the relationship between racial diversity and group effectiveness. This finding suggests that a low-to-moderate level of diversity contributes to group performance, while increasing the diversity beyond the moderate level harms performance. Similarly, Ali et al (2011) found an inverted U-shaped relation between gender diversity and firm performance among Australian firms. Moreover, a similar (but not exactly the same) stream of literature on firm's international diversification found inverted U-shape relation between firm's diversification to different market and its performance. The main reason here is the "information overload" and exceeded "transaction costs" which is inevitable after a certain level of diversification is reached. This will lower the speed of learning and hence reduce firm's performance eventually (Hitt et al, 1997; Zahra et al, 2000).

Insert Figure 1 approximately here

To sum up, Blau's theory of heterogeneity predicts a U-shaped relation between diversity and firm performance, while the resource-based view combined with social identity theory predicts an inverted U-shaped relation. Therefore, we formulate the following two competing hypotheses concerning the relation between diversity and firm performance:

Hypothesis 1a: The relationship between diversity and firm performance is curvilinear following a U-shaped curve.

Hypothesis 1b: The relationship between diversity and firm performance is curvilinear and follows an inverted U-shaped curve.

2.3. Cultural diversity and firm performance in crises time

As reviewed in Section 2.2, there is abundant work on the effect of diversity (top management teams and also employee diversity) on firm performance and competitiveness broadly defined, including productivity, return on equity, market performance, and innovation performance (Richard, 2000)[3]. However, the literature has largely ignored the effect of cultural diversity on the firm's performance in "crisis time", i.e. adaptability to environmental changes,[4] both theoretically and empirically. Such crisis time can be seen as an important "moderating factor" in the diversity-performance relationship. There are arguments both in favour and against diversity in volatile environment. First, some authors noted the negative effects of diversity in volatile environments. First, firms in volatile and unstable environments usually face tensions and conflicts due to shifts in power (Wiersema and Bantel, 1993). More importantly, organizational failure is more likely for firms operating in unstable as compared to stable environments (Agle et al., 2006). A diverse workforce seems incompatible for firms operating in a turbulent environment because diverse groups generally take longer to become cohesive and coordination among firm members is less efficient (Williams and O'Reilly, 1998). In fact, previous research has documented how diversity can slow down the decision-making process, which is a detriment for firms in unstable environments (Herring, 2009). It takes time for a firm to reap the benefits of having a culturally diverse work force in order to overcome the difficulties associated with the volatile environment that characterizes times of crises. This is mainly due to the slow decision making process of a diverse human capital pool (Richard et al, 2007). Following the conceptualization of Haans et al (2016), the above argument means that crises time (as a moderating factor in diversity-performance relation) can strengthen the "cost" function of diversity (let it be exponential or logarithmic cost function), while the benefit function remains the same. This in turn applies a downward move of diversity-performance curve (let it be U-shaped or inverted U-shaped), and hence a lower tipping point. This is shown in Figure 2A and formulated in hypothesis 2a.

Conversely, some authors pointed to the positive effect of diversity particularly in volatile environment. Cultural diversity promotes firm flexibility, and hence firm adaptability to change and performance, because of three main reasons: First, from a knowledge-based perspective,

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[3] This literature clearly shows that there is no simple one way relationship between diversity and firm performance. Positive and negative effects may occur depending on factors such as management styles and decision making procedures.

[4] An example of such adaptability to environmental changes is the ability of firms to adapt to changes imposed by the recent economic crisis.

firm performance depends to a large extent on the firm's ability to combine and integrate different types of knowledge (Grant, 1996). Culturally diverse firms are assumed to integrate more heterogeneous knowledge and should therefore perform better in terms of creativity and decision-making effectiveness (Richard et al., 2007). In this line of argument, ethnic minorities tend to have especially flexible cognitive structures. Such cognitive flexibility enhances the tolerance for ambiguity and the ability to excel in performing ambiguous tasks (Cox and Blake, 1991), which is a dominant feature in times of crises. Second, if a firm is successful in overcoming a typical resistance to change in the difficult area of accepting diversity in the first place, it should be well positioned to handle resistance to other types of change (Iles and Hayers, 1997), which is again an inherent feature in crises times. Third, the existence of diversity among employees, leads to a better understanding of particular customer preferences and requirements, which in turn would facilitate reaching a broader customer base (Morrison, 1992). This will be particularly important in times of crises, since the purchasing power of customers are generally reduced and hence the need to reach out to a broader customer base is even more pronounced.

In a stable environment, successful firms by definition can draw on past experience, heuristics in decision-making, existing routines and managerial practices. Thus, the different perspectives introduced through cultural diversity may play a smaller role in comparison with crises times. Moreover, these previously successful frames of reference can be potential forces of lock-in and myopia. This would be particularly harmful for firms in a volatile environment, in which adaptability to change is vital. In such a situation, cultural diversity can be highly valuable, since it facilitates the variation in perception and interpretation of the volatile environment. Moreover, when fundamental environmental change occurs, broad networks, due to existence of a diversified labor force, increases the likelihood that such changes are identified at an early stage and that firms have access to relevant information for interpreting what these changes mean for them. Following the conceptualization of Haans et al (2016), the above argument implies that crises time (as a moderating factor in diversity-performance relation) can strengthen the "benefit" function of diversity, while the cost function remains the same. This in turn means an upward move of the diversity-performance curve (let it be U-shaped or inverted U-shaped), and hence a higher tipping point. This is shown in Figure 2B and formulated in hypothesis 2b.

Insert Figure 2 approximately here

The above arguments lead us to have the following competing hypotheses concerning the magnitude of the effect of diversity on firms' performance (let it be either U-shaped or inverted U-shaped):

Hypothesis 2a: Diversity contributes less to firm performance in volatile than stable environments.

Hypothesis 2b: Diversity contributes more to firm performance in volatile than stable environments.

3. Empirical study

3.1. Data and variables

This study uses registry data of firms and individuals provided by the Statistical Office of Sweden covering the years from 2003 to 2012. The individual registry provides among others data on citizenship, education and occupation. By linking individuals to their employers, this data allows to represent important characteristics of the workforce of firms with a high degree of reliability. From the firm registry, data is sourced about firms' industry classification, investments, assets, location, and total number of employees. In total, 1,384,856 observations of 264,433 firms are included in the analysis.

The dependent variable, employment growth, is measured as follows[5]:

$$e\_growth_{i,t} = ln(employment_{i,t+1}) - ln(employment_{i,t})$$

where the subscript $i = 1,2,...,N$ denotes firms and the subscript $t = 1,2,...,T$ refers to the year of observation. $employment_{i,t}$ stands for the average number of employees converted to full-time employees for firm i in year t in accordance with the firms' annual reports as reported in

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[5] An alternative would be to calculate employment growth as the ratio between change of employment and previous employment: [employment(t+1) – employment (t)]/employment(t). This is, however, more sensitive to outliers than the measurement used in this paper. For the sake of comparison, annex 2 includes the main results (corresponding to table 2) using the alternative measure. The coefficients of the alternative measure in annex 2 are larger than what is reported in table 2 suggesting that the logarithmic differences are a more conservative measure. Our findings about the shape of the relationship are not affected.

the official Swedish structural business statistics. Measuring employment growth, as a firm performance, has the advantage of being robust against short-term fluctuations and accounting practices smoothing out financial results, which is of particular relevance in a volatile environment. Furthermore, due to the costs and risks involved in laying-off and hiring new staff, employment growth is a strong indicator for the management's expectation about the future performance of the firm, which in times of crisis directly relates to the ability of the firm to adapt to the changes in the competitive landscape.

The independent variable is a proxy for cultural diversity using citizenship data of a firm's employees. Citizenship implies that an individual has a strong tie to a specific socio-cultural and institutional context due to birth and/or time spent in the respective nation state. We acknowledge the limitation that citizenship does not comprehensively measure all dimensions of culture. The advantages are, however, that data on citizenship is highly reliable and available for all individuals registered in Sweden. Harrison and Klein (2007) point out that diversity can be conceptualised as separation, disparity or variety, which in turn has an effect on how diversity should be operationalised. Diversity understood as separation emphasises diverging positions or opinions between individuals, thus potentially inducing conflict and eroding cohesiveness. Disparity refers to different shares individuals hold in socially valued assets such as income, power or status. Variety, in contrast, aims at capturing complementary types of knowledge, expertise or background, which comes closest to the interpretation of cultural diversity in the context of this paper. The Blau index is commonly used to operationalise variety and thus applied in this paper as follows:

$$div_{i,t} = 1 - \sum_{j=1}^{J} s_{j,i,t}^2$$

The subscript $j=1,2,...,J$ refers to citizenship groups and $s_{j,i,t}$ stands for the share of citizenship group j in total employment of firm i in year t. The individual registry data categorizes individuals in the following citizenship groups: Sweden, Nordic countries (without Sweden), Europe (without Nordic countries), Africa, North America, South America, Asia, and other. Given that the data includes 8 citizenship groups this variable ranges from 0 to 0.875, where firms with employees from only one citizenship group have a value of 0.

Besides the Blau index, Harrison and Klein (2007) identify the Teachman index as alternative for measuring variety. The Teachman index is calculated using the logarithm of the shares. This

does not work well with the data at hand because only very few firms have employees of all citizenship groups. This means, most observations contain zero values for the share of some citizenship groups in total employment. The logarithm cannot be applied to zero values and thus most observations would be lost. As robustness check, we use the total number of citizenship categories a firm covers through her employees. This measure for variety is rare but has been used for instance by Ozgen et al. (2013). The results hold with this alternative measure and we report them as robustness check in Annex 3.

The study controls for human capital measured by the share of employees with an academic degree (i.e. three years or more studying at university). Effects of changes in physical capital are accounted for by firms' investments in machinery and equipment in thousand Swedish Krona divided by the total assets of the firm. Size is captured by the natural logarithm of total employment. Furthermore, the study considers 82 industry fixed effects based on 2-digit NACE codes, the firms' location in 20 Swedish counties and the period of observation. These fixed effects capture industry, national, and regional particularities. If for instance the ICT industry grows faster than other industries, the coefficient for the ICT industry dummy would be positive, resulting in a shift of the intercept for ICT firms. The coefficients of cultural diversity are consequently only influenced by the firm growth that goes beyond the respective industry growth. In the same way, the year dummies correct for national employment crisis/booms and the county dummies consider growth differences due to county specificities. Annex 1 presents descriptive statistics used and annex 5 reports the descriptions for all variables used in this study.

3.2. Analytical approach

The empirical study tests hypotheses concerning i) the shape of the relationship between cultural diversity and employment growth and ii) the relative magnitude of this relationship before and after the GFC. Employment growth is explained by:

$$e\_growth_{i,t} = \alpha + \beta div_{i,t} + \gamma div^2_{i,t} + \eta firm_{i,t} + \zeta location_{i,t} + \delta industry_i + \phi z_t + \mu_i + \varepsilon_{i,t}$$

where employment growth ($e\_growth_{i,t}$) is a function of citizenship diversity ($div_{i,t}$), citizenship diversity square ($div^2_{i,t}$), other firm characteristics ($firm_{i,t}$), fixed effects associated with the county in which the firm is located ($location_{i,t}$), industry fixed effects ($industry_i$), temporal shocks (z_t), firm fixed effects (μ_i) and random errors ($\varepsilon_{i,t}$). Firm characteristics include human capital and human capital square, size and size square; and relative investments.

The analytical approach rests on a comparison of observations before and after the GFC in 2008. The crisis can be considered as exogenous. It hit Swedish firms irrespective of the level of cultural diversity, to which Swedish firms have a negligible influence on the crisis. Moreover, being one of the most severe crises since World War II, it is fair to assume that it poses relatively high demands on firms' adaptability. The years from 2003 to 2007 cover the pre-crisis period while 2008 to 2012 is defined as (during and) post-crisis period.

This model is estimated using Between Effects (BE) and Fixed Effects (FE) regressions as implemented by Stata's xtreg command (Stata, 2013, p. 359-394). The BE regressions are estimated on averages in the observation period. Thus, the BE model allows comparing the relationship between the average growth rate and average cultural diversity before and after the crisis in a cross-sectional framework. While such an analysis is relevant, it does not deal with unobserved individual effects. Depending on the assumptions, this is best achieved with a Random Effects (RE) or FE model. The Hausmann test shows a failure of the zero correlation assumption and implies therefore that the FE model should be used.

As firm growth studies have shown that current growth tends to be related to growth in the previous period, the study uses the following model as an alternative:

$$e\_growth_{i,t} = \alpha + \theta e\_growth_{i,t-1} + \beta div_{i,t} + \gamma div^2_{i,t} + \eta firm_{i,t} + \zeta location_{i,t} + \delta industry_i + \phi z_t + \mu_i + \varepsilon_{i,t}$$

The model is identical to the previous one with the exception of adding employment growth in the previous period ($e\_growth_{i,t-1}$) as explanatory variable. The Arrelano-Bond (AB) (Arellano and Bond, 1991) estimator is used and implemented with Stata's xtabond2 command (Roodman, 2006). As regards the AB estimator, the instrumental variables are included in levels and without imposing restrictions on the time lags or collapsing the instruments. Following Roodman (2006), the reported AB specifications have coefficients for lagged employment growth that lies between the respective values of OLS and FE regressions.

3.3. Results

Table 1 presents the average growth rates of the firms in the observation period. In total, the study is based on 1,384,856 observations of 264,433 firms. The average growth rate is approximately 2.2%. The crisis hit in 2008 and the data shows an adjustment of employment in the period from 2008 to 2009 of approximately -0.5% on average. After 2008 the growth rates are lower as compared to the previous years.

Insert Table 1 approximately here

Table 2 shows the results covering the years 2003 to 2011. Regardless of which estimation technique is used, we find an inverse U-shaped relationship between cultural diversity and employment growth. As discussed in more detail below, the coefficients of cultural diversity and cultural diversity square are large in magnitude while the standard errors are comparably small. This observation as regards the shape of the relationship is surprising because the literature frequently refers to Blau's theorem according to which the relationship between diversity and firm performance should follow a U-shaped relationship, i.e. the opposite. Hence, we find support for Hypothesis H1b but not for Hypothesis H1a.

Insert Table 2 approximately here

The bottom of the table displays a calculation about the level of cultural diversity that is associated with the highest effect on employment growth. This is equal to the turning point of the equation beyond which a further increase in cultural diversity tends to reduce employment growth. The turning point lies at a cultural diversity of approximately 0.3. Only minor deviations are observed depending on the method used from 0.30 (BE) to 0.37 (AB). Compared to firms with a cultural diversity of 0 (the majority of firms) the effect on employment growth lies between estimated 8.6 percentage points (FE) and 9.8 percentage points (AB). Considering that the average growth rate is approximately 2.2%, the identified effect of cultural diversity is substantial.

This inverse U-shaped relationship is corroborated when zooming in on the period when a reduction in overall growth is observed in the economy. According to table 1, the average growth peaked in year 2006, weakened in 2007, and became negative in 2008. A model is calculated, which uses the difference in employment over this period as dependent variable and estimates the relationship with cultural diversity in 2006 using a cross-sectional analysis (see table 3). The results are qualitatively very similar with the ones reported in table 2 and are therefore not discussed further.

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Figure 3 depicts the relationship for the different estimators used. The horizontal axis shows different levels of cultural diversity. The vertical axis marks the estimated addition to employment growth in percentage points at the respective levels of cultural diversity. While there are slight differences in magnitude, the overall pattern is reasonably stable across different estimation techniques. It is also worth noticing that the p-values for cultural diversity and cultural diversity square are in all models below 1%. Thus, we can be highly certain about the validity of the observed inverse U-shaped relationship in our sample.

Furthermore, the figure shows the points at which the total effect of cultural diversity turns negative. This point lies at a cultural diversity between 0.60 (BE) and 0.74 (AB) while the FE model estimates it at 0.63. Given that 95% of the firms are characterized by a cultural diversity of equal or smaller than 0.32 our data suggests that for the vast majority of firms an increase in cultural diversity is associated with higher employment growth. For a small share of the firms in our sample, namely the 5% with the highest values for cultural diversity, a further increase in cultural diversity is associated with negative effects on employment growth.

Turning to the control variables, the relationship between employment growth and human capital follows an inverse u-shape, which is largely in line with the literature. A bit surprising, however, is the magnitude of the squared term. It implies that up to a level of human capital of approximately 50% an increase in human capital adds to employment growth. Augmenting human capital beyond this level has a negative effect on employment growth to the extent that firms with very high levels of human capital do not differ in employment growth from firms with very low levels of human capital. As regards size, the results confirm existing studies that larger firms tend to grow less than small firms and that the negative effect flattens out as firms become larger. Maybe somewhat surprising, investments in machinery and equipment relative

to total assets turns out not to be related to employment growth. Potential negative effects resulting from a substitution of labour by physical capital and potential positive effects relating to an enhanced competitiveness due to better machinery and equipment appear to balance out. The negative and significant coefficient for the lagged employment growth variable in the AB model suggests a regression to the mean employment growth.

Table 4 presents the results for the pre- and post-crisis periods separately. The inverse U-shaped curve of the relationship between employment growth and cultural diversity is confirmed for the pre- and post-crisis period and is robust across all implemented models, thus providing further evidence against hypothesis H1a and for hypothesis H1b. Turning to the second pair of hypotheses, we find that the coefficients in the post-crisis period are higher in magnitude as compared to the pre-crisis period regardless which estimator is used. Furthermore, the maximum effect of cultural diversity at the respective turning points is higher in the post-crisis period. Using the AB model the effect of cultural diversity in the post-crisis periods amounts to 10.9 percentage points as compared to 4.3 percentage points in the pre-crisis period. The difference is smaller when using other estimators. The FE model estimates the effect at the turning point in the post-crisis period to be 9.4 percentage points and in the pre-crisis period 7.6 percentage points whereas the calculated effect following the BE model is 8.4 and 7.7 percentage points respectively. This provides strong evidence against Hypothesis H2a.

Insert Table 4 approximately here

We illustrate the estimated addition to employment growth for different levels of cultural diversity before and after the crisis in Figure 4 (AB model), Figure 5 (FE model), and Figure 6 (BE model). The figures depict the calculated values based on the coefficients of the respective models. The horizontal axis shows different levels of cultural diversity and the vertical axis the estimated addition to employment growth at the respective levels of cultural diversity. The two curves represent the pre-crisis and post-crisis results. All curves posit an inverse u-shape of the relationship between employment growth and cultural diversity independent of estimation method and period of observation. Furthermore, all estimates imply a steeper slope in the post-crisis period, which means that the relationship between employment growth and cultural diversity is of higher magnitude. There are, however, some differences between the FE/BE and AB models. As compared to the FE/BE models, the AB models are characterized by i) turning

points at higher levels of cultural diversity, ii) a flattened curve in the pre-crisis period, and iii) a higher maximum point in the post-crisis period. This implies that the difference in the magnitude between the maximum points in the post- and pre-crisis period is substantially larger, concretely estimated 6.6 percentage points as compared to 1.8/0.8 percentage points for the FE/BE models. Thus, the results support Hypothesis H2b although it has to be acknowledged that the difference between pre- and post-crisis period is relatively small for the latter models.

Insert Figures 4 - 6 approximately here

However, how can the differences between the FE and AB model be interpreted that are particularly pronounced in the pre-crisis period? The AB model considers employment growth in the preceding period, which in all cases is negative and significant. This means that firms with a relatively high growth rate in the preceding period tend to show a lower growth rate in the current period, and vice versa. In other words, the data suggests a regression to the mean. When the competitive environment is relatively stable, firms will find it more difficult to maintain a competitive advantage over longer periods of time than when the competitive environment is volatile. This is because a volatile environment implies increased market and technological risks, therefore making it more difficult for firms to i) identify promising strategies, and to ii) change organizational routines accordingly. This could then be the reason why – after considering the regression to the mean effect – less remains to be explained by the other factors in the pre-crisis period, i.e. the coefficients should be lower in magnitude, which is not only the case for cultural diversity but also for all other explanatory variables.

4. Conclusion

4.1. Summary

The aim of this paper was to investigate the relationship between cultural diversity and employment growth of firms. We also investigated the role of a relevant external factor, i.e. the occurrence of the GFC during and after 2008, into the relation between diversity and firm performance. This in turn allowed us to shed light on the adaptability of firms in the volatile time. Two main findings emerged: First, the relationship between cultural diversity and employment growth follows an inverted U-shaped curve. Second, the effect of cultural diversity

on employment growth is more pronounced in and after the crisis as compared to before the crisis.

4.2. Theoretical and empirical contributions

These findings have important theoretical implications. They challenge Blau's theory of heterogeneity (1977) stipulating that homogeneous and highly diverse firms should perform better than firms with a medium degree of diversity. Blau's theory is commonly applied in the management literature and also supported empirically. Interestingly, however, Richard et al. (2007) found that the proclaimed U-shaped relation only holds in more stable environments.

This paper advances an alternative theoretical perspective, which finds support in the presented empirical analysis. The argument is that the combination of the resource-based-view (Barney, 1991; Ali et al, 2011) with social identity theory (Knouse and Dansby, 1999) suggests the opposite, i.e. that introducing diversity to a homogeneous group should increase performance whereas too much diversity may lead to the formation of sub-groups that hinder communication across groups and induce conflict.

The paper discusses that theoretically both the negative and positive effects associated with diversity may be more pronounced during times of crisis. The positive effects of diversity comprise the ability to combine and integrate different types of knowledge, more flexible cognitive structures, working routines to handle conflict and resistance to change, and better understanding of a broad customer base (Laursen and Salter, 2006; Morrison, 1992). The negative effects relate to conflicts between sub-groups and slow decision-making (Agle et al., 2006).

Empirically, the paper contributes with the analysis of a unique longitudinal dataset covering all registered firms in Sweden. It goes beyond existing studies by showing robustness across different adequate estimation methods. Furthermore, the moderating effect of the GFC in 2008 is analysed, as a relevant and important external factor affecting firms. The GFC in 2008 introduced an exogenous event that has changed the competitive landscape introducing volatility and uncertainty, consequently the need of firms to adapt to these changes.

4.3. Implication of the study for other contexts

Although this paper used data coming from Sweden, the implication of the findings goes beyond that. The GFC hit most countries in the world. Even in certain cases where the effect of the GFC was relatively modest, such as in Australia, the damage was still remarkable.

According to the Australian Bureau of Statistics, growth in the economy declined to half a percent, unemployment rate raised by almost 2 percentage points (ending up to be around 6%), and the wealth of Australian households decreased by nearly 10% by the mid-2009 (ABS, 2010).

In such a situation, there is no comprehensive and longitudinal matched employer-employee dataset available in most countries (including Australia) in order to allow us to investigate possible factors that may help the recovery of companies in such crisis time. Fortunately, such comprehensive dataset exits in a handful of countries, of which one of them is Sweden. Therefore, by getting the advantage of a unique matched employer-employee dataset available for the 'population' of all Swedish firms, we have been able to provide empirical evidence that would have been otherwise impossible to obtain in most other countries. The Swedish context and economy has a lot in common with other advanced economies, which allows us to generalize the implications of the study to other contexts. For instance, when it comes to Sweden and Australia, both economies have recovered relatively fast from the GFC mostly by the end of 2009. Moreover, both economies are predominantly small and open (export-oriented) economies with a high share of service compare to manufacturing[6].

The empirical investigation of cultural diversity in most advanced countries, such as Australia, is predominantly occupied by 'determinants' of cultural diversity, social inclusion, and acculturation (Azmat, 2015; Lu et al, 2011). This paper systematically investigated the other side of the coin for cultural diversity, i.e. the 'effect' of cultural diversity on performance of firms. This is particularly important to investigate, since earlier studies suggest that culturally diverse workforce (e.g. migrant workers) are commonly disadvantaged in workplaces (cf D'Netto et al, 2014).

This study also has management implications. The main take away is that increasing cultural diversity contributes to firm performance and firm adaptability at least up to the certain point of cultural diversity. This is particularly true in volatile times and environments (except for firms that are already characterized by a very high degree of cultural diversity). Another implication is to raise awareness about a potential negative effect of cultural diversity that might kick in, particularly when diversity increases to a very high level and the workforce becomes

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[6] Moreover, from a national cultural perspective, Sweden and Australia are also very similar. They rank very similar in the majority of Hofstede's six cultural dimensions (except in masculinity, in which Australia ranks remarkably higher than Sweden). Similarly, Triandis (1995)'s study categorised both Sweden and Australia as the nations with so-called "horizontal individualism", as opposed to other types such as vertical individualism.

fragmented in sub-groups. Thus, increasing cultural diversity should always be accompanied by routines for integration and conflict resolution (Maznevski, 1994, Pelled et al., 1999).

Finally, the findings in this paper has some societal implications. In the current era of rising xenophobia, anti-immigrant, and anti-diversity, we found that cultural diversity, up to a certain point, has indeed positive effect on employment growth and hence on the economy as a whole. Interestingly enough, and in contrary to xenophobic propaganda, such positive effect is particularly more pronounced in the financial crisis time (once again, we are referring to up to a certain level of diversity).

4.4. Directions for future research

The findings in this paper open up several areas for future research. First of all, in this paper, we measured cultural diversity by the birth country of individual employees. Although this is a conventional way of measuring the construct of interest in this paper, future research may use other measures by borrowing the literature in related fields, in order to validate and shed further lights on the relationship between cultural diversity and firm performance. An example is the advancement in psychology literature, in which cultural diversity is captured with the Big Five personality traits of individuals, i.e. Extraversion, Conscientiousness, Openness, Agreeableness, and Neuroticism (Stuetzer et al., 2017). Second, in developing a cultural diversity at the level of firms, we treated all employees as equally important for the fate of the company. The diversity literature, however, suggests that diversity among employees at various hierarchical level of organizations may have different impact on organizational outcome (Kang et al, 2007). For instance, diversity among Top Management Teams (TMTs) and/or Middle-Management Teams (MMTs) may have higher influence on organisational outcome in compare with lower level employees (Ou et al., 2017). Future research may investigate the organisational hierarchies as a moderating factor in investigating the effect of cultural diversity on organisational outcomes, such as employment growth or innovation outcomes. Third and finally, we looked at employment growth as firm performance in this paper. Other firm performance, particularly innovation performance of firms, as the main driver of competitiveness of firms (Tavassoli, 2017; Tavassoli & Karlsson, 2016), can be used in future research to broaden our understanding about the effect of cultural diversity and firm performance.

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Figure 1: Theoretical illustration of the combinations of latent mechanism (benefit and cost) resulting in the shape of cultural diversity and firm performance relationship
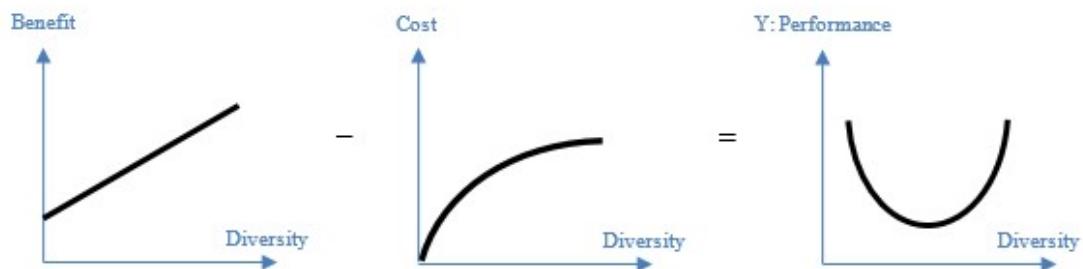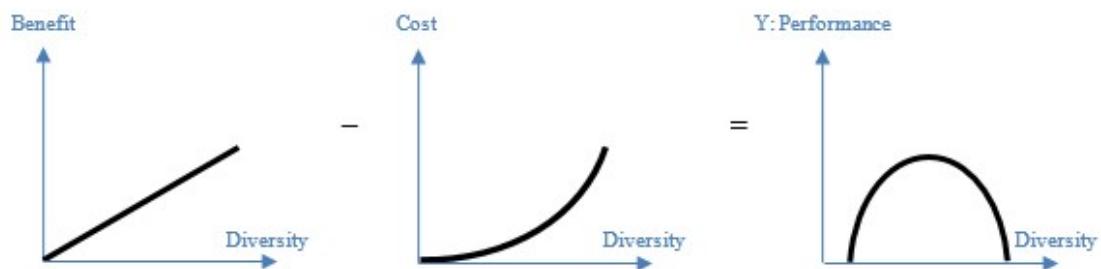
Figure 2: Theoretical illustration of the combinations of latent mechanism (benefit and cost) resulting in the shape of cultural diversity and firm performance relationship before ( ) and after ( ) crises
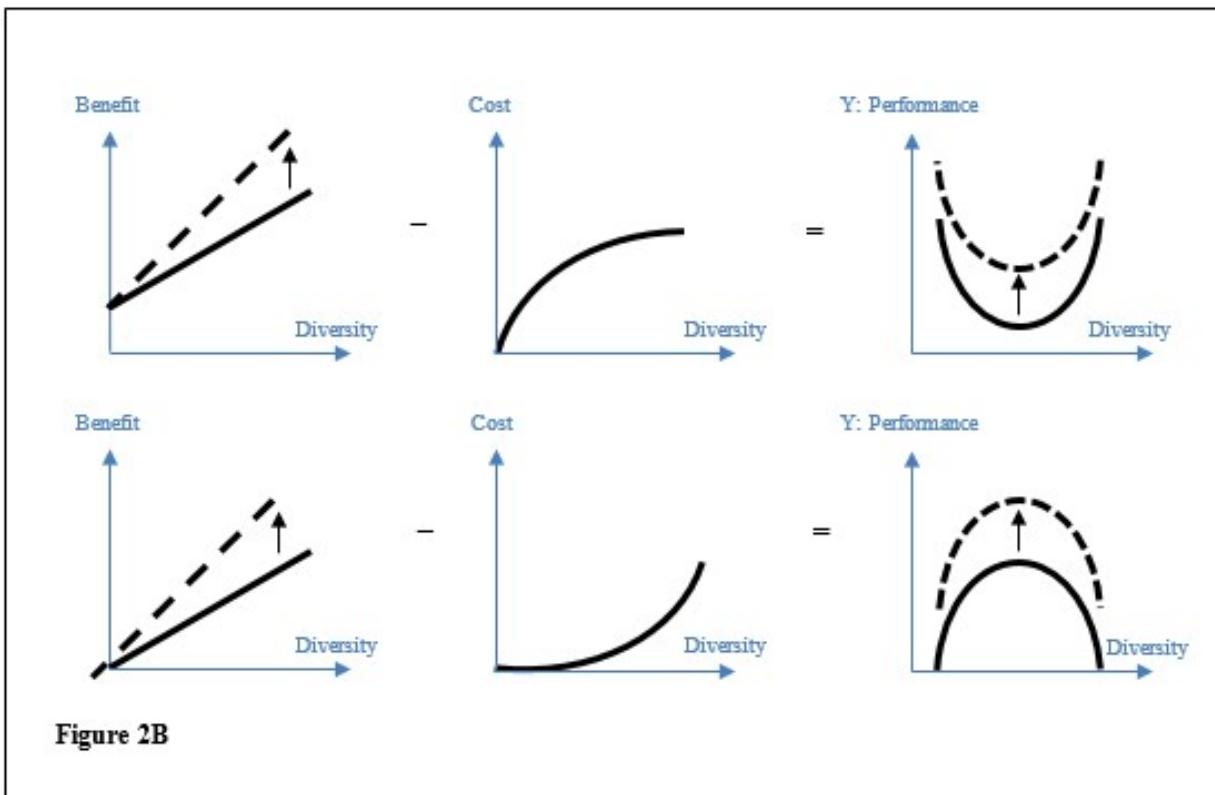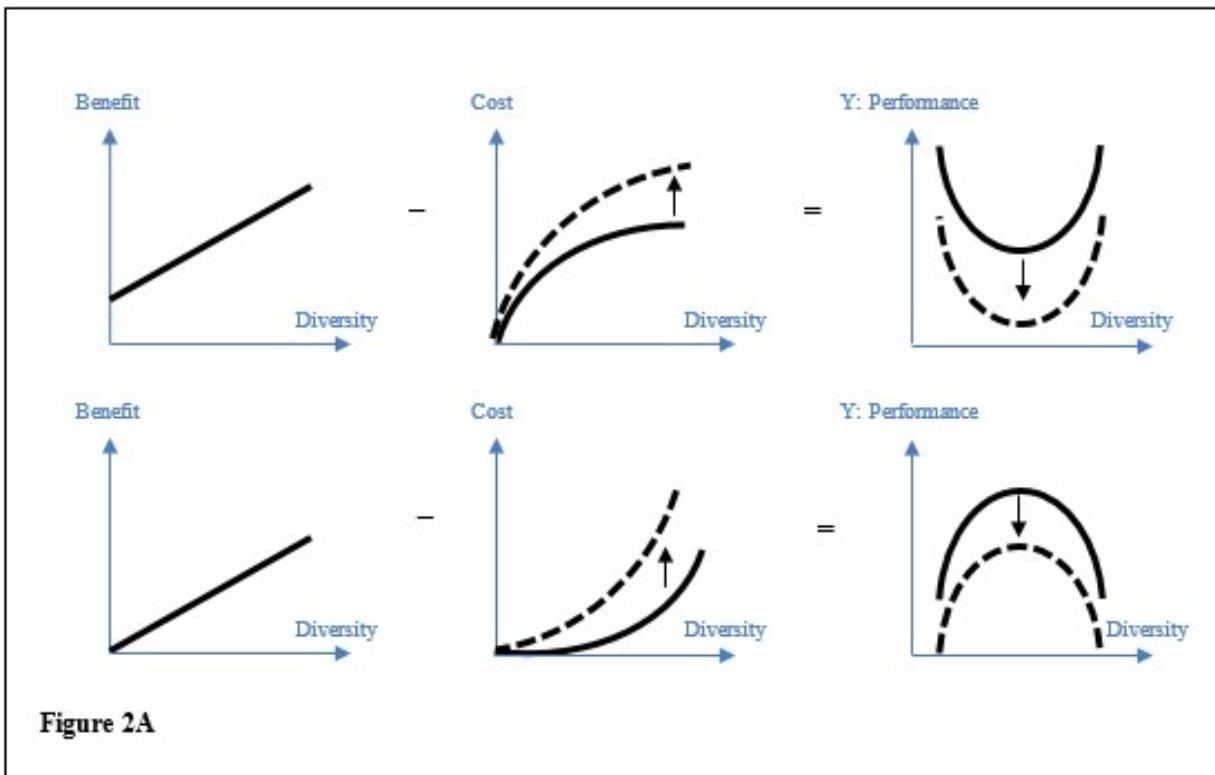

Figure 2A

Figure 2B

Figure 3: Graphical illustration of the estimated relationship between employment growth and cultural diversity using different estimation techniques
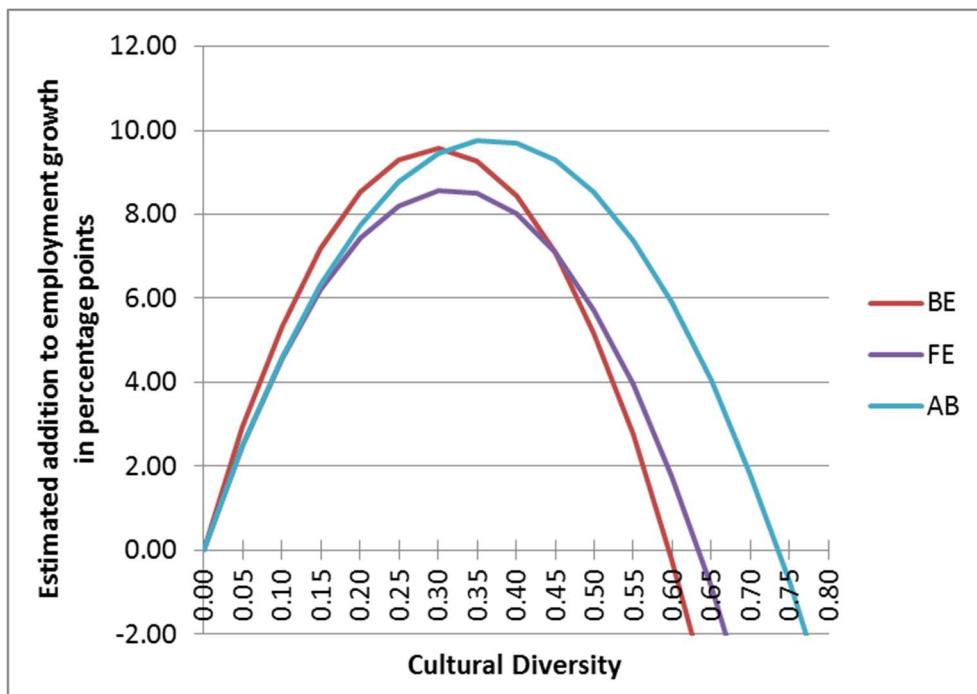

Figure 4: Graphical illustration of the estimated relationship between employment growth and cultural diversity in the post- and pre-crisis period using the AB estimator
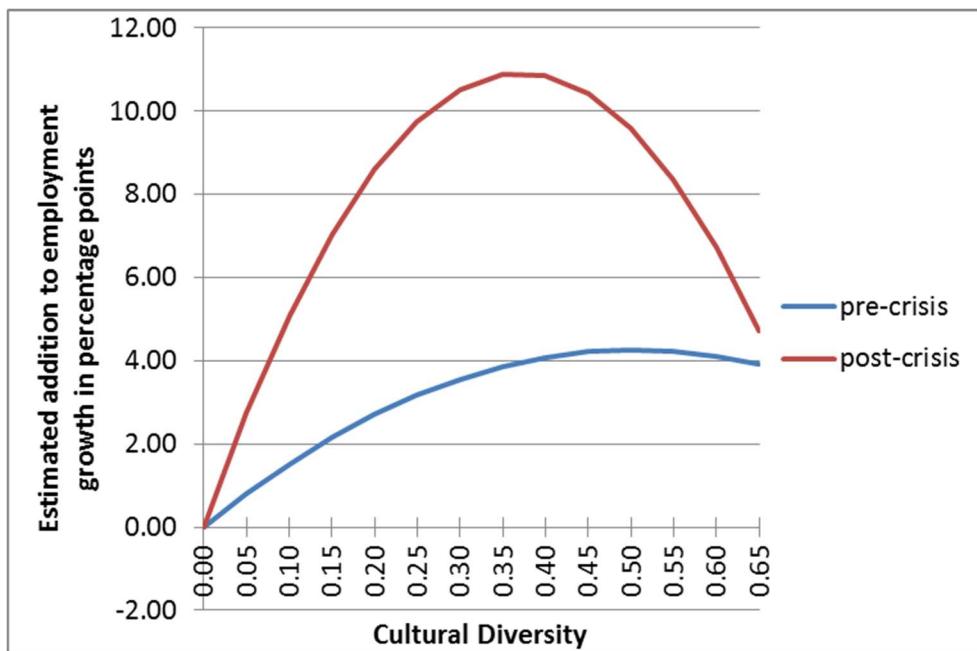
Figure 5: Graphical illustration of the estimated relationship between employment growth and cultural diversity in the post- and pre-crisis period using the FE estimator
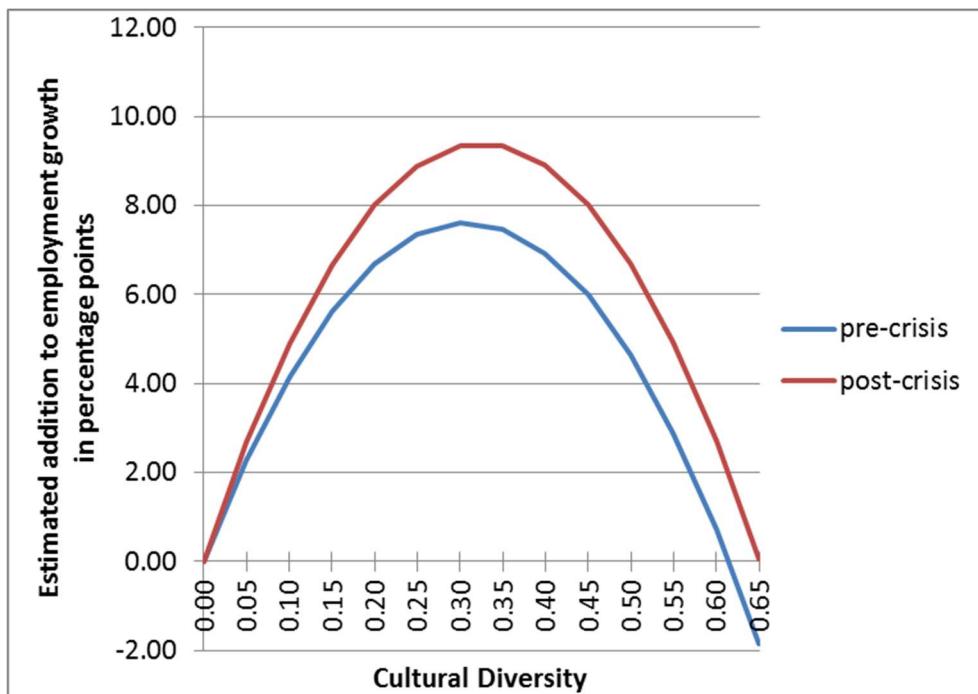

Figure 6: Graphical illustration of the estimated relationship between employment growth and cultural diversity in the post- and pre-crisis period using the BE estimator
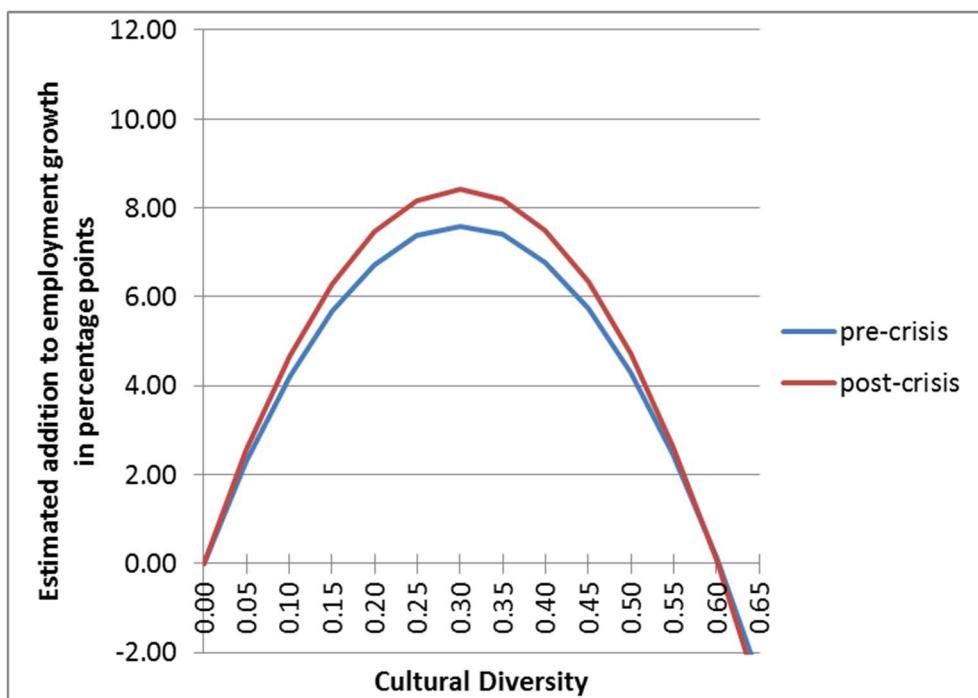
Table 1: Average growth rate of the observed firms.

Year	Mean	Std. Dev.	Freq.
2003	0.0183	0.3111	109,487
2004	0.0398	0.3249	122,064
2005	0.0409	0.3356	133,026
2006	0.0416	0.3513	147,194
2007	0.0273	0.3628	165,067
2008	-0.0053	0.3541	172,083
2009	0.0121	0.3548	174,443
2010	0.0254	0.3513	179,837
2011	0.0106	0.3459	181,655
Total	0.0221	0.3464	1,384,856

Table 2: Regression of cultural diversity on employment growth covering the period 2003-2011

	BE	FE	AB
Cultural diversity	0.6410	0.5421	0.5312
	(0.0223/0.000)	(0.0120/0.000)	(0.0246/0.000)
Cultural diversity square	-1.0745	-0.8549	-0.7216
	(0.0472/0.000)	(0.0262/0.000)	(0.0527/0.000)
Human Capital	0.4073	0.3937	0.3499
	(0.0074/0.000)	(0.0055/0.000)	(0.0154/0.000)
Human Capital square	-0.4448	-0.4625	-0.4326
	(0.0077/0.000)	(0.0057/0.000)	(0.0147/0.000)
Size	-0.0635	-0.6906	-0.3999
	(0.0012/0.000)	(0.0014/0.000)	(0.0066/0.000)
Size square	0.0100	0.0507	-0.0045
	(0.0003/0.000)	(0.0004/0.000)	(0.0030/0.127)
Capital investments per total assets	0.0042	0.0016	0.0010
	(0.0139/0.763)	(0.0031/0.615)	(0.0046/0.822)
Employment growth (t-1)			-0.0455
			(0.0012/0.000)
Constant	-0.1543	0.7795	
	(0.0078/0.000)	(0.0041/0.000)	
Industry dummies	Yes	No	No
County dummies	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes
Observations	1,384,856	1,384,856	864,966
Number of firms	264,433	264,433	190,237
R2-within	0.0031	0.299	
R2-between	0.0486	0.0033	
F /chi2	117	14,061	37,155
AB AR1 test			-82.81
AB AR2 test			1.11
Turning point	0.2983	0.3171	0.3681
Effect at turning point	0.0956	0.0859	0.0978

Notes: The table report the estimated coefficients. The standard errors / p-values are in parentheses. The dependent variable in all three models is employment growth in a given year. BE stands for the Between Effect estimator, FE for the Fixed Effect estimator, and AB for the Arellano & Bond estimator. F-statistics are reported for BE and FE regressions; Wald Chi2 for the AB regression.

Table 3: Regression of cultural diversity on employment growth using 2006 as base year and the logarithmic difference in employment between 2006-2009

	OLS
Cultural diversity	0.5583
	(0.0463/0.000)
Cultural diversity square	-1.0665
	(0.1028/0.000)
Human Capital	0.3663
	(0.0174/0.000)
Human Capital square	-0.3805
	(0.0184/0.000)
Size	-0.2145
	(0.0032/0.000)
Size square	0.0294
	(0.0007/0.000)
Capital investments per total assets	0.0044
	(0.0069/0.530)
Constant	0.1820
	(0.0089/0.000)
Industry dummies	Yes
County dummies	Yes
Observations	131,412
Number of firms	131,412
R2	0.050
F-statistic	66
Turning point	0.2617
Effect at turning point	0.0731

Notes: The table report the estimated coefficients. The standard errors / p-values are in parentheses. The dependent variable in all three models is employment growth in a given year. OLS stands for the Ordinary Least Square.

Table 4: Regression of cultural diversity on employment growth in the pre- and post-crisis period

	BE pre-crisis	BE post-crisis	FE pre-crisis	FE post-crisis	AB pre-crisis	AB post-crisis
Cultural diversity	0.5038 (0.0264/ 0.000)	0.5592 (0.0229/ 0.000)	0.4960 (0.0180/ 0.000)	0.5777 (0.0186/ 0.000)	0.1691 (0.0582/ 0.004)	0.5886 (0.0343/ 0.000)
Cultural diversity square	-0.8355 (0.0578/ 0.000)	-0.9296 (0.0487/ 0.000)	-0.8067 (0.0395/ 0.000)	-0.8872 (0.0396/ 0.000)	-0.1677 (0.1151/ 0.145)	-0.7938 (0.0726/ 0.000)
Human Capital	0.3636 (0.0087/ 0.000)	0.3637 (0.0081/ 0.000)	0.3522 (0.0081/ 0.000)	0.4015 (0.0088/ 0.000)	0.1668 (0.0314/ 0.000)	0.4345 (0.0212/ 0.000)
Human Capital square	-0.3980 (0.0091/ 0.000)	-0.3993 (0.0085/ 0.000)	-0.4063 (0.0084/ 0.000)	-0.4799 (0.0091/ 0.000)	-0.2454 (0.0304/ 0.000)	-0.5125 (0.0208/ 0.000)
Size	-0.0580 (0.0014/ 0.000)	-0.0935 (0.0013/ 0.000)	-0.8175 (0.0022/ 0.000)	-0.9335 (0.0024/ 0.000)	-0.5189 (0.0123/ 0.000)	-0.4022 (0.0098/ 0.000)
Size square	0.0083 (0.0003/ 0.000)	0.0141 (0.0003/ 0.000)	0.0427 (0.0006/ 0.000)	0.0471 (0.0007/ 0.000)	-0.0524 (0.0096/ 0.000)	-0.0079 (0.0036/ 0.029)
Capital investments per total assets	0.0007 (0.0034/ 0.829)	2.7761 (0.5540/ 0.000)	0.0042 (0.0044/ 0.338)	0.5558 (0.2145/ 0.010)	0.0017 (0.0051/ 0.732)	0.0005 (0.0634/ 0.994)
Employment growth (t-1)					-0.0340 (0.0021/ 0.000)	-0.0469 (0.0017/ 0.000)
Constant	-0.1458 (0.0059/ 0.000)	0.0556 (0.0045/ 0.000)	1.0181 (0.0069/ 0.000)	1.0804 (0.0071/ 0.000)		
Industry dummies	Yes	Yes	No	No	No	No
County dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	676,838	708,018	676,838	708,018	335,373	529,593
Number of firms	183,112	240,427	183,112	240,427	129,004	173,525
R2- within	0.0009	0.0056	0.3716	0.4179		
R2-between	0.0587	0.0652	0.0065	0.0093		
F /chi2	103	154	9731	11574	9104	19192
AB AR1 test					-13.78	-68.01
AB AR2 test					-1.64	-1.8
Turning point	0.3015	0.3008	0.3074	0.3256	0.5042	0.3707
Effect at turning point	0.0759	0.0841	0.0762	0.0940	0.0426	0.1091

Notes: The table report the estimated coefficients. The standard errors / p-values are in parentheses. The dependent variable in all three models is employment growth in a given year. BE stands for the Between Effect estimator, FE for the Fixed Effect estimator, and AB for the Arellano & Bond estimator. F-statistics are reported for BE and FE regressions; Wald Chi2 for the AB regression.