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Ageing workforce and firm growth in the context of "extreme" employment growth events

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ABSTRACT

In recent years demographic aging and its consequences have been recognised and discussed on macroeconomic levels, such as health care system, infrastructure, housing and labour market. However, the consequences are not only present on the macroeconomic level but also affect microeconomic issues such as a firm's growth and workforce. This exploratory study realises a microeconomic issue and investigates the linkage between aging workers and employment growth. More precisely, it aims to analyse the potential effect that age composition of a firm's workforce may have on a firm's employment growth. The study applies a linked employer–employee dataset of 2100 German firms, covering the time period from 2001 to 2006. We used quantile regression techniques to address the aging effect in the context of "extreme" employment growth events. The empirical investigation shows that, on average, employment growth slows down as the average age of the workforce increases.

1. Introduction

The growth of firms has positive macro- and micro-economic effects. Therefore, firm growth (coupled with the related factors and its explanation) is a well-studied field of research in the economic literature (e.g. Metcalfe, 1993; Hannan and Freeman, 1977). A wide range of factors is found to affect firm growth, such as firm-internal and firm-external factors (e.g. Acar, 1993). Usually, the impacts of firm characteristics on firm growth are studied without explicitly considering the socio-demographic characteristics of the workforce, entrepreneurs and employees. Put differently, our study focuses on the influence of workers aging on employment growth. In general, the implications of demographic aging on economic growth (Börsch-Supan et al., 2007) and regional disparities are repeatedly studied (e.g. Ludwig, 2005). The age distribution of the workforce (i.e. aging of the employees and workers) can be expected to have an important influence on firms' activities (e.g. Lévesque and Minniti, 2005). However, too much emphasis has been put on the macro-economic effects of demographic aging (e.g. Gonzales-Eiras and Niepelt, 2012) by neglecting the micro-economic effects, such as the effect on firm growth. Our study deals with an important and under-researched issue. In recent years, researchers and policy makers have paid increasing attention to aging because of its impact on several developed countries, where average age is increasing, and many developing countries, where the average age is declining. Both situations have huge effects on the economy and also on microeconomic effects (e.g. workers' issues) which so far, have been almost entirely ignored. In a nutshell, demographic aging and its consequences have for the most part been recognised and discussed on macroeconomic levels such as health care system, infrastructure, housing and

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labour market. However, the consequences are increasingly present on the microeconomic level such as a firm's growth and workforce rather workers' issues. Furthermore, workers' issues have other characteristics that make them a perfect factor for the study. Firstly, the activities, competencies and socio-demographic characteristics of workers can be assumed to influence firm growth in many different ways. It can be expected that younger and older workers and employees work differently and, as a consequence, engender different strategies and competencies in the way firms grow (e.g. Friedberg, 2003). However, it is very difficult to disentangle the socio-demographic structure of the workforce and its impact on firm growth. Secondly, it can be expected that some firms do not show any impact of workers aging on firm growth, meaning that firms usually remain completely independent of the age structure of the workforce (e.g. small-sized firms). But studying these relationships within different firm size classes, we observe different relationships, implying that smaller and larger firms are affected by age (understood as a static measure) and aging (understood as a dynamic measure) in completely different ways. We therefore aim to obtain a clearer picture of the impact of workers aging on employment growth.

The purpose of this paper is to understand the potential effect that age composition of a firm's workforce might have on a firm's employment growth. In addition, we also examine the overall impact of the age structure, because it is impossible to explicitly study the workers' structure without knowing the latter. The overall impact of demographic aging on firm growth has been repeatedly studied in the literature (e.g. Ludwig, 2005). However, the findings vary. We repeat this analysis in order to see which results from the literature are confirmed and in order to obtain a basis of comparison for the estimations. The analysis is divided into two major parts: firstly, we set up estimations, in which we analyse the impact of the average age structure (i.e. understood as a current firm characteristic) of the workforce on employment growth. Secondly, we study the impact of the average aging effect (understood as a direct temporal effect) on firm growth in terms of employment growth. The study explores the relationship between the age structure of the workforce and the growth in employment among 2100 German firms between 2001 and 2006. In other words, the study focuses on the cases of "extreme" employment growth events, that is, growth among the best performing (i.e. highly growing) firms and growth among the worst performing (i.e. highly shrinking) firms. The paper finds on average, that the relationship between age structure (average age of workforce) and the dynamics of firms is most appreciable when firms experience drastic changes in size. More specifically, a firm whose workforce is fairly young is more likely to grow more, the opposite holding for firms with an older workforce. The paper presents evidence by size (small, medium and large), sector (industry and services) and location (West and East) of the firms.

The structure of the paper is as follows. Section 2 derives the theoretical implications on the empirical evaluation of age and aging as well as their relevance for employment growth. The hypotheses are subsequently developed in the same section. Section 3 discusses the empirical variables, the regression approach as well as the data and data source we used. The findings are presented and discussed in Section 4. Section 5 presents the limitations of the study and Section 6 concludes the paper.

2. Theoretical derivation and hypotheses

It can be suggested that firm growth and its explanations are an important and well-studied topic in existing economic and geographic literature. Yet firm growth is considered a heterogeneous process with high complexity, individual characteristics and various combinatorial and strategic issues (i.e. additive and multiplicative contributions). It can be regarded as idiosyncratic which also emphasises our motivation. Hence, there is a wide range of theories and empirical approaches that deal with firm growth and its growth-related factors (for an overview, see Coad, 2009), and that address the topic from very different perspectives. Sociological concepts focus on the availability of resources and highlight them as a central source of firm growth (e.g. Metcalfe, 1993; Hannan and Freeman, 1977). Although the possibility of certain resources influencing growth has and is being discussed, the theory and empirical studies do not put much emphasis on the contribution from socio-demographic (i.e. age and aging) characteristics of the workforce which might affect firm growth. Thus, one important fact which the reader must certainly be aware of is the discussion around current social developments, such as demographic changes. For instance, the changing age distribution of the population and workforce may be an important influence on the rate of new firm formation, (e.g. Lévesque and Minniti, 2005) or specifically firm growth which has not been studied so far. Because of the complexity in this domain, there is a need for additional research with regard to key dimensions, strategic issues and managerial practices. This paper tries to improve the understanding of current developments and generates an informational and explanatory value by updating existing knowledge in the areas of firm growth and an aging workforce. Previous empirical studies have often dealt with the impact of demographic change on a macro-level (e.g. Gonzales-Eiras and Niepelt, 2012; Weber, 2010). There are several studies dealing with the overall importance of employment and the availability of qualified labour for innovation (e.g. Acs and Audretsch, 1990; López-García and Puente, 2009).

To the best of our knowledge, there is hardly any empirical literature analysing the impact of an aging workforce on employment growth. Therefore, our work specifically deals with the consequences of aging at a micro-level (i.e. firm level). A few studies have already dealt with the discussion on aging implications and firm performance (e.g. Ilmakunnas and Maliranta, 2007). As such, Ashworth (2006) investigates workforces in the electric power industry (i.e. knowledge-intensive industry) and finds that aging of the workforce could cause short-term and permanent loss of knowledge. Moreover, Meyer (2011) presents some empirical evidence on the relationship between the age structure of the workforce and the adoption of new improved technologies. She found that a homogeneous