European Journal of Business and Management
ISSN 2222-1905 (Paper) ISSN 2222-2839 (Online)
Vol.6, No.14, 2014

Significance of Entrepreneurship? A Appraisal of Recent Research

Mirza Muhammad Omer
Government College University
Email:Umarmirza9@gmail.com

ABSTRACT
This paper investigates the degree of current empirical evidence that can communally and systematically authenticate the claim that entrepreneurship has important economic value. A systematic assessment is provided that can answer the contribution of entrepreneurs to the economy in contrast to non-entrepreneurs? We study the comparative contribution of entrepreneurs to the economy based on four measures that have most widely been studied empirically. Hence, we answer the question: What is the contribution of entrepreneurs to (i) employment creation and dynamics, (ii) innovativeness and (iii) productivity and growth, relative to the contributions of the entrepreneurs' counterparts, i.e. the 'control group'? A fourth type of contribution studied is the role of entrepreneurship in escalating individuals' effectiveness levels. 57 recent studies of high quality that contain 87 relevant separate analyses, were referred to conclude that entrepreneurs have a very important – but specific – purpose in the economy that they bring about relatively much employment creation, productivity growth and produce and commercialize towering quality innovations. They are more satisfied than employees. More importantly, recent studies show that entrepreneurial firms produce important externalities that affect regional employment growth rates of all companies in the region in the long run. However, the counterparts cannot be ignored either as they contribute to a relatively high value of GDP, a less unpredictable and more sheltered labor market, higher paid jobs and a greater number of innovations or they have a more dynamic role in the adoption of innovations.
Keywords: entrepreneur, entrepreneurship, self-employment, productivity, economic development, growth, employment, innovation, patents, R&D, utility, remuneration, income

1.Introduction

Though exceptions remain , academic studies on entrepreneurship are provoked by the economic benefits of entrepreneurship. Most studies refer to one or two academic studies showing that entrepreneurship. Indeed generates benefits in terms of, for instance, employment generation or innovations. However, whether the cited reference was one of the few out of many studies that 'happened' to find accommodating evidence is not yet clear. This paper examines to what extent recent empirical evidence can collectively and systematically substantiate this claim. Entrepreneurs and their counterparts are defined and compared to assess their contribution to the creation of economic value. Hence, the aim is to review recent empirical literature that provides an (statistically supported) answer to the following question: What is the economic value of entrepreneurs in comparison to their counterparts, i.e. no entrepreneurs? Based on empirical studies into this subject, we arrive at four measures to quantify the economic value of entrepreneurs. Hence, we answer the following particular questions: What is the contribution of entrepreneurs to (i) employment generation and dynamics, (ii) innovation, and (iii) productivity and growth, relative to the assistance of the entrepreneurs' counterparts, i.e. the 'control group'? A fourth type of contribution that we study is the role of entrepreneurship in increasing individuals' utility levels. Astonishingly, given the application of screening the relationship between entrepreneurship and economic outcomes, this paper is the first review of the (primary) pragmatic literature in this area. More accurately, it is the first review of high quality economics and management studies, focusing on various types of contributions that entrepreneurs can make to the economy in terms of quantifiable measures and evaluating the entrepreneurs 'performance in these areas relative to their counterparts, i.e. larger, older or incumbent firms. In these senses,our study is unique. Besides emphasizing what our study might contribute, it is also worthwhile to acknowledge what it does not supply. Economic or management theories about why and how entrepreneurs contributing more or less to specific aspects of economic value creation, such as employment or innovation, are not incorporated. They are beyond the scope of our study and provided elsewhere, as for instance in
Parker (2004) and in many of the studies reviewed. We only provide an (rather thorough) overview of the empirical evidence of the contribution for economic value creation by entrepreneurs.
The remaining of the paper is structure to as follows section 2 talks on the definitions of the key variables i.e entrepreneurs ,the counter parts of the entrepreneurs .generation of employment its dynamics ,factor of innovation, productivity and growth and the indicators used in the utility of derivated from entrepreneurship. In section 3 how entrepreneurs are contributing to employability in terms of level and growth..Moreover how the remuneration of the employee relates to his or her quality of work. The section 4 discusses the entrepreneur's

contribution to the innovation, its affects on production and how it is commecialised.The adoptability of the innovation by the entrepreneurs. In section 5 the contribution of entrepreneurs for better productivity and value addition with input factors .In section 6 the level of utility derived from entrepreneurship in comparison to those working as intrapreneurs.In the same section it is further evaluated what are the expectation level for income volatility, job satisfaction .Finally section 7 concludes.

2.Data Sample Selection and Definitions

The categorization literature was done systematically. That is gathering of sufficient data of particular population gathered from published and unpublished studies with quality information on the issue. The focus remained on the recently published articles in high impact journals ranked A or AA economic journals additionally small business and entrepreneurship field journals were i.e The Small Business Journals (The prominent journal in the field of economics)and Journal of Small venturing the leading entrepreneurship Journal .The Strategic Management Journal ,The Academy of Management Journal and Administrative Science Quality were also referred. No reference to any book was taken as such.Secondly to apply the result to the latest economic environment the research from 1995 to the present was considered in reference to the developing countries. The discussion papers of the same time frame were also considered for refrence.Thirdly an exploratory search of the studies analyzing the value o entrepreneurship showed that foremost benefit analyzed by the literature relates to employment ,innovative practices, productivity and growth and individuals utility levels .These constitute the four categories of the benefits we analyze .For this purpose the key words at the main search engines such as Google scholars were used. The measures are quantative outcome of the variables defined such as employment, innovation,productivity and growth .The final requirement in the study was to impose a empirical check to find if the qualified contribution from entrepreneurs is greater than counterparts. The eligibility for observation bases on rate of firms individual that can be considered entrepreneurial as well as rate of firms that can be considered counterparts.

2.2

Defination of Enterpreneur and Counterpart

Commonly used definitions of the entrepreneur and the entrepreneurial firm are incorporated in this study. The term entrepreneur and entrepreneurial firms are synonymously used.Enterpreneurial firms are that satisfy one of the following conditionality's firstly they employ less than 100 employees, their age is less than seven years, they are usually new in market. Now the control population is aging more than 7 years, with more than 100 employees, incumbent firms. The section on utility examines individuals and thus need other definitions. The entrepreneurs are self employed or owning an incorporated business where the size and age of the business are not the decisive influences.

Enterpreneurship is studied in the relevancy to these terms both at micro level that is at the level of an individual firm or at the macro level .In the latter case the rate small firms, young firms ,new firms or entrepreneurs is assessed in at regional level or at the national level. But question arises how did we arrive on these definations.In alignment to Schumpeterian Entrepreneur ,the entrepreneur is defined as being a market entrant or young firm that has recently entered the mrket is straightforward and these defination –young or entrant firms – often engaged in entrepreneurial research. Though most entrepreneurial firms are small are not always entrepreneurial and identifying small firms as entrepreneur is being less clear-cut though a common practice among entrepreneurship policy makers and academics to which we abide by.Moreover, following trailing the majority of the studies on entrepreneurs the view is developed that those who have started up a business i.e who are self employed or the owner-manager of an incorporated as entrepreneurs too. They may be inappropriate as self employment is often not related to the inception of the firm whereas entrepreneurship is .Nevertheless without an accepted superior empirical definition we opt not deviate from conventional approach.

To measure the size of the firms the conventional methods of considering measures such as number of workforce and sales have been used. More commonly a cut out of 100 employees to measure size has been considered. But at the same time sizes of 10-20,20-50,50-100 and 100 plus employees have also been considered in scattered studies. Again the purpose of such reference is to keep 100 a boundary between large and small. A considerable portion of studies is related to economic contribution to continuity in firm size measures. Under that case the relativity between entrepreneurs and control groups is less significant and conclusions drawn between the relationship of economic benefits to firm size are linearly entered or otherwise. The same is held for the measure firm age and if boundaries are chosen they are usually between 5-7 years.It is to be noted that various definitions are more often though combined implicitly entrants are young as defined and uncommonly hired more than 100 employees. As a result the simple size does not give allowance for a distinction between the various definitions of the entrepreneurial firms as an instance we do not persuade the analysis of the extent to which young firms could be innovative as compared to new market players or other small firms. This is what limits our study.

2.3 Indicators of Contribution to the Economic outcome

For the sake of employability it is if add to the number of employees or quality of employment. The growth of

the firm measures the job creation in relativity to the size of the firm. The same is used as indicator of how much in numbers the jobs are created. The quality of the employability is considered in terms of remuneration offered to the workforce .The primary indicators used are wage level, benefits that is health insurance and the use of the performance related pay methods. Job Satisfaction level of the entrepreneurial firms in comparison to the workforce in counter parts also comes up as final indicator of quality in employability.

To study innovation a multitude of factors have been used .In regard to the firms innovative output the production of innovation in terms of quality and quantity are used. For quantity commonly used measure of empirical evidence are expenditures on the research and development although this is an input measure than output., similarly their patents ,introduction of new products and utilization of latest technology. The quality of innovation is represented by patent citations and significance of the innovation however measured.Futhermore the commercialization of the innovation gains in terms of economic value.

Productivity and growth of a firm can be firms or regional contribution towards the country's gross domestic product as a growth factor. Therefore we studied the literature that has taken into consideration the firm or regions value added ,its labor productivity this can be further explained as GDP per worker or total factor productivity that is output generated by both labor and capital. All such studies that have examined these factors for productivity have been considered as relevant.

Utility as indicator that is the entrepreneurs individual utility in reactivity to that of the employees The first source that came up is the expected income .Risk is another factor that can affect the utility of risk aversive entrepreneurs negatively.

2.4Search For Statistics as Sample

All issues of each selected journal and working papers within the publications that were considered as relevant were studied. If an article had suggested relevance the abstract of the same was analysed to seek inclusion into the review .Finally content of the article was checked whether the study actually satisfied all requirements defined earlier. This particular method of data collection is an effort to summate relevant studies with the given requirements and margin of error. That is we are liable to miss an article if the heading is too generalized. Still effort was made to scrutinize vaguely mentioned headings .All the references were carefully browsed so that if found relevant it was checked so that even our study is not exhaustive yet maintains relevancy.

Studies were conducted from publication category EcAA,for the years 1998-2013,2 articles were studied,EcA for the year 1998-2013,11 articles were studied,SB for year 1998-2013,34 articles were readme for the year 1998-2013,2 artcles were read, from category WP 8 articles were read so in all 57 articles were read.Two third of the articles were published in Small Business and Enterpreneurship journals, the rest in economic journals or not yet. One third remaining have been published after 2002,omprising of all categories of studies. But at the same time it can said that studies of ninetees and beyond.

27 Articles discuss employment with further details on employment creation,dyanimcs of employability, remuneration of the workforce ,similarly 21 articles on innovation with further debate on product, its commercialization, adoption of innovative measures ,25 references of production and growth that is how value addition, labor productivity and total factor productivity develop a pattern and comparison.and 14 validations of utility explained further by income level,volatility and satisfaction level., these sum upto 87 observations in all defining the independent and dependent variables.

The number of studies in the first three outcomes categories employment ,innovation, productivity and growth is similar though the category of utility is smallest with 14 studies .More than half of the studies about employability pertain to sub category of employment creation, whereas vast majority of the remainder of the studies talk about how entrepreneurs contribute towards the quality of employability. Half of the innovation studies focus on the contribution of the entrepreneur to innovation being commercialized .Productivity and growth are mostly related quantifying labor productivity whereas the utility of entrepreneurs is mentioned by income in most studies less commonly by income volatility negatively or satisfying.

Various categories of studies define entrepreneurs as being large, small young and new and self employed .The definition of innovation is more spotted and likewise for productivity and growth. Though most of the observations are analyzed individually about firms but their productivity and growth is observed in aggregation that is at regional, industrial and country level. We conclude that results and conclusions drawn are based on recent studies in quality economics and entrepreneurship generals.

3 Contributions to Employment

The section reviews the recent evidence of the entrepreneurial firms in generating employability, both in terms of quality, dynamics and quality where the second refers to the aspect of the employee's compensation.

3.1 Generation of Employment

The empirical literature can be categorized based on aggregated and disaggregated data has been analysed.The ambiguous results show employment has been excessively created by entrepreneurial firms.

Based on aggregated data Baldwin(1998) concludes that in Canadian manufacturing plants with capacity of 100

employees and less are showing a rising number in employment creation from the period 1973-1992 whereas larger firms have shown a decreasing rate. Johansson (2005) who studied Swedish IT firms finds a u shaped relationship between firms size and employment growth. With employment at minimum level with firm having employee's size of 240.Shaffers (2006) records the positive externality created by firms through job creation he emphasizes the aggregate affect of firms on the economy.

Michael Fritsch (2007) studied in aggregate the direct and indirect affect of entrepreneurial activity in creation of employment, he also mentions that new start ups are driven by business development and incumbents are forced out due to the competition. But at the same time it creates competitive edge and economic growth. But this raises few questions that that after how many years rewards of improved efficiency ,business turnover and economic growth are recored/What are the short term and long term effects of the activity?These questions are well ansered in the recent studies.

The conclusions of the studies are regional in nature because data belongs to various countries covered within same years. Higher rate of startups is related to the immediacy for employability, however after some years the relation between employability is negative as due to high competitiveness that forces the incumbent firms to lay off labor and exit the market. But again in the long run positive trend is recorded because the firms become competitive.Fritish(1997),Mueller(2006) and Fritish & Mueller (2007) studied the German regions,Acs and Mueller(2006) studied US regions ,Baptisa et al,(2007) Portuguese regions ,Van Stel and Suddle (2007) Dutch and Folster(2000) Swedish regions.Based n country level data Carree and Thurik (2007) find evidence for same pattern .Increased rate of ownership of business has instantaneous small affects on employment generation a mid term negative affect and a long term positive influence.

Studies using disaggregated data to examine the relationship of firms size and age and the proportional number of jobs firm has created follows a framework derived from actually one of the primary postulation .Gibrats law of proportionate affect (Gibrat,1931).The derivation of Gibrat laws assumes that growth rate are same for all firm sizes. A very popular generalization of Gibrat framework allowing for heterogeneity in growth rates is the equation mentioned by (Parker,2004).

$$\ln q_{it+1} = \alpha_i + \beta \ln q_{it} + u_{it+1}$$

Estimating coefficient of firm size shows whether $(\beta>1)$ or small $(\beta<1)$ It mentions that firms have grown faster and it is valid as long as size is measured in terms of number of employees. Studies in our sample that pursue this method are Calvo (2006, Spain), Hart and Oulton (1996, UK), Konings (1995, UK), and Oliveira and Fortunato (2006, Portugal). All four show the way to the conclusion that smaller (surviving) firms have the highest percentage-rate growth. Thus, relative to their size, small firms created more jobs than did large firmsa different method for probing job creation (and employment dynamics, see below) by small against large firms based on micro-data is most often attributed to Davis and Haltiwanger (1992) and relies on expressive analysis. Therefore, those studies do not belong to this review. However, due to the force ofthis kind of studies and their prevalent use to analyze employment (dynamics), we discuss seven of these studies (which is not included in the tables) briefly. The category of studies has an benefit above those using the framework based on Gibrat's Law that they share with studies based on aggregated data like regions or industries: They include the effects of firm way in and way out.Simply place, the method sort firms by whether they have shaped or shattered jobs, i.e. developed or shrunk, and by size class. Whether a firm has created (destroyed) jobs depends on whether it has a larger (smaller) size (in employees) at time t+1, than at time t. Thus, employment formation is caused by firms that have grown or entered the market, while employment destruction is caused by firms that have shrunk or exited the market. Employment generated by a given size class is the totting up of the jobs created by the increasing (or entering) firms within that size class. Employment damaged is analogously defined. These numbers are converted into job creation and annihilation rates by dividing them by the average size of the firms within the size class. Whether an entire size class (i.e. all growing and dwindling firms within a size class) has created jobs depends on the 'net employment growth rate' which is given by subtracting the job destruction rate from the job formation rate.

Davis and Haltiwanger (1992) find that in U.S. manufacturing (1972-1986) the size class with between1 and 99 employees has higher job formation and job devastation rates than larger firms. The effects counteract and ultimately result in rather similar net employment growth rates across size classes. Davis et al. (1996), studying the U.S. mechanized sector in 1972-1988, also find similar net employment growth rates for various size classes. Younger firms have higher net employment growth rates, see Davis and Haltiwanger,1992. Baldwin and Picot (1995, Canada) and Broersma and Gautier (1997, Netherlands) demonstrate that smaller manufacturing firms have higher net employment growth. Picot and Dupuy (1998) show the same result for the Canadian economy in common. Thus, although the studies may find different rates, smaller and younger firms tend to have higher net employment growth rates. Therefore, the net input to employment creation will be higher for entrepreneurs, relative to their own size.

The downbeat connection between firm growth and size (or age) that is found in three categories of studies, each having specific drawbacks (and compensation), is consistent with abundant earlier empirical studies. In fact, as Parker puts it more broadly (1994, p. 215) "While many incongruent results have been published, one of the most important and widely verified is the following: Firm growth rates are decreasing in firm size among firms of the same age; and are decreasing in firm age among firms of the same size."." The upper panel of Table 3.1 shows the explicit results.

The bottom panel of Table 3.1 show that worker reallocation is elevated in entrepreneurial firms (Burgess et al., 2000) and small firms have relatively impulsive growth rates over time (Burgess et al., 2000; Lever, 1996). We conclude that employment dynamics are larger in entrepreneurial firms. This conclusion is supported by the 'Davis and Haltiwanger' method that generates a measure of the employment dynamics of a size class, i.e. the 'job reallocation rate', the sum of the employment creation and destruction rates. Young and small firms contribute relatively much (little) to employment dynamics (security), see Davis and Haltiwanger (1992); Davis et al. (1996), Baldwin and Picot (1995), Broersma and Gautier (1997) and Picot and Dupuy (1998) for supporting for various countries, sectors and time periods.

Table 3.1: Evidence of the Relative Contribution of Entrepreneurs to the Quantity of Employment

Study	Journal	Sample	Aspectof Employment	Entrepreneur definition	Mainfinding	Firm entry/ exit	Effect *
EmploymentGeneration							
Fritsch (1997)	SB	75 Western Germanregions ('86-'89)	Regionalempl. growth in 1 year growthin 1 year	newfirmstart-per (i) 1000 empl.; (ii) stock of firms	Higherstart-upratesleadto direct empl. creation. Mid term consequence negative todirectempl.Creation.effect negative	Yes	+/ -
Fölster (2000)	SB	24Swedish regions ('76-'95)	Regionalempl. rates	Regionalself-empl. rate	Self-empl.leadsto higher empl. rates	Yes	+
Baldwin (1998)	SB	Canadian mnf plants ('73-'92)	Empl. shares	Empl. share of size classes (employees)	Growth of empl. share larger for small size class	Yes	+
Johansson (2005)	SB	26 Swedish IT industries ('94-'98)	Industry empl. growth	Industry av. firm size (employees)	Greater av. firm size reduces ind. empl. growth	Yes	+
Shaffer (2006)	SB	2038 US regions ('82-'87)	Regional empl. growth	Regional av. firm size (employees)	Greater av. firm size reduces regional empl. growth	Yes	+
Mueller et al. (2007)	SB	59 UK regional Firm start-up rates ('81-'03)	Regional empl. growth in 2 years	New firm start-ups per 1000 empl.	Greater start-up rates lead to empl. creation, directly and indirectly, in the long run	Yes	+
Acs & Mueller (2007)	SB	320 US regions ('90-'03)	Regional empl. growth in 3 years	New firm start-ups per 1000 empl.	""	Yes	+
Fritsch & Mueller (2007)	SB	74 German regions ('83-'02)	Regional empl. growth in 2 years	New firm start-ups per 1000 empl.	""	Yes	+

Baptista et al. (2007)	SB	30 Portuguese regions (‘82-’02)	Regional empl. growth in 2 years	New firm start-ups per (i) 1000 empl.; (ii) stock of firms	””	Yes	+
Van Stel & Suddle (2007)	SB	40 Dutch regions (‘88-‘02)	Regional empl. growth in 3 years	New firm start-ups per 1000 labor years	””	Yes	+
Carree and Thurik (2007)	SB	21 OECD countries (‘72-‘02)	National empl. growth	Changes in ownership rates	””	Yes	+
Calvo (2006)	SB	967 Spanish mnf firms (‘90-‘00)	Firm growth (Gibrat’s Law)	Firm size (employees)	Smaller firms grow faster	No	+
Konings (1995)	SB	1800 UK plants (‘80,’84 & ‘90)	Firm growth (Gibrat’s Law)	Firm size (employees)	Smaller plants grow faster	No	+
Oliveira et al (2006)	SB	7653 Portuguese mnf firms (‘90-[illegible]	Firm growth (Gibrat’s Law)	Firm size (employees)	Smaller firms grow faster	No	+
Hart and Oulton	Ec A	50441 UK firms (‘89-‘93)	Firm growth (Gibrat’s Law)	Firm size (employees)	Smaller firms grow faster	No	+
EmploymentDynamics							
Burgessetal. (2000)	Ec A	26835USmnf andnon-mnf firms(‘85-‘94)	Worker reallocation	Firmsize (employees)	Reallocationhigherin small firms	No	-
Lever(1996)	SB	Dutchmnf firms (‘74-‘86)	Speedof empl. adjustment	Firmsize (employees)	Smallerfirmempl.gen. morevolatile	Yes	-
Overall			Entrepreneurshaveahigher,butmorevolatile, contributiontoemploymentgeneration		+		

*Evidence is positive (+) if findings indicate that entrepreneurial firms’ positive contribution is relatively large. It is negative (-) if the opposite is found and indeterminate (0) if the study does not show significant differences between entrepreneurs and their counterparts.

3.2. Compensation and Satisfaction Employees

All studies on ‘firm size wage differentials’ arrive at a similar conclusion: Smaller and younger firms pay their employees lower wages. For example, Wunnava and Ewing (2000) find that in 1989, small U.S. firms (<100 employees) pay their male employees 18% less than otherwise matching employees of medium sized firms (with 101-499 employees) and 27% less than large firms (+500 employees).

The wage first-rate earned by employees in larger firms has three observed causes: First, entrepreneurs take up individuals with lower levels of human capital in requisites of education and experience (Troske, 1999 and Winter-Ebmer and Zweimuller, 1999). Second, entrepreneurs tender lower proceeds to those individual characteristics (Oosterbeek and Van Praag, 1995). Finally, entrepreneurs run firms in which the capital-skill complementarily is lower (Troske, 1999). Workers working in more capital intensive firms are paid higher wages and larger firms are more capital concentrated than smaller firms. On top of the difference in wages between smaller and larger firms that can be explained by these factors, an inexplicable dissimilarity in wages residue. As Troske (1999) summarizes: “However, none of the explanations can fully account for the employer size-wage premium. In the end there remains a large, significant, and impenetrable premium paid to workers of large employers.” (p. 15).Brown and Medoff (2003), who study firm age wage differentials, give you an idea about that the positive association between firm age and employee wages even turns into a off-putting relationship when controlling for worker heterogeneity. “The higher wages paid by established firms are completely explained by the observable characteristics of their workers. It is not just experience and tenure but also schooling, profession, and other demographic characteristics.” (p. 693).

Table 3.2 shows an general idea of the studies in our sample on firm size (age) wage differentials with(out) controls for worker heterogeneity: The firm size wage differential does not fade away but becomes smaller when scheming for worker heterogeneity, whereas the firm age wage differential even turns negative (for the largest part of the age distribution) based on one observation only.

Table 3.2: Regression Results with and without Controlling for Worker Heterogeneity (WH)

		w/o WH	w/ WH	Additional Details		
Stu	Regressor	β	β	Country	Period	N
Brown and Medoff, 2003, p. 684. Dependent variable: Ln(wage/hour)						
	Age of	0.022***	-0.001	U.S.A.	1992	1,067
	Ln(age of	0.042**	-0.035**			
Winter-Ebmer and Zweimuller, 1999, p. 90. Dependent Variable: Ln(wage)						
	Size Class 0-4	ref.	ref,	Switzerlan	1991-1996	7,453
	Size Class 5-9	0.046***	-0.010			
	Size Class 11-99	0.095***	0.025**			
	Size Class 100+	0.129***	0.030***			
Troske 1999, p. 19. Dependent variable: Ln(wage)						
	Log firm size	0.033***	0.026***	U.S.A.	1989	129,901
	Log plant size	0.064***	0.047***			

****, ***, **, and * denote significance levels of 0.1%, 1%, 5%, and 10%, respectively.

Besides finding that large firms pay their workers higher take-home pay, Wunnava and Ewing (2000) also derive that the likelihood a given individual will obtain benefits, such as medical insurance, life insurance, maternity leave and retirement benefits increases with firm size. Moreover, Cowling (2000) establishes that entrepreneurs use productivity-related-pay (PRP) schemes less frequently than the counterparts in 1996. Hence, it seems that entrepreneurs are less likely to offer employees other forms of compensation. Winter-Ebmer and Zweimuller (1999) infer job satisfaction levels from actions taken by employees in Switzerland: on-the-job-search (for alternative employment) and actual job changes. Both activities are undertaken less recurrently by employees of larger firms (p. 92) and the authors conclude that employees of smaller firms must be less satisfied with their job.In contrast, Frey and Benz (2003), who scan actual scores on a job satisfaction questionnaire, find that employees of smaller German, British, and Swiss firms have higher average job satisfaction scores than employees of larger firm in consistency with the findings by Clark and Oswald (1996) for U.K. employees. The mean satisfaction scores for small (<25 employees), medium (25-199), and large (>199) firms are appreciably different and show that employees of the smallest firms are more satisfied. Furthermore, the percentage of workers reporting to be 'very satisfied' is highest in the smallest firms. These three studies reflect ambiguity .Based on these two direct measures we reach a conclusion that satisfaction level of the employees in the entrepreneurial firms is higher. However this is contradictory to the results o indirectly measuring job satisfaction. All these studies relate to Europe.

In comparison to counterparts as shown in the table below entrepreneurs offer meager packages and benefits to the work force. So quality standards are ignored by entrepreneurs than counterparts and that is because they hire less skillful workforce with much level of competencies. But still job satisfaction in smaller entrepreneurial firms is higher which needs to be investigated.

Table 3.3: Evidence of the Relative Contribution of Entrepreneurs to the Quality of Employment

Study	Journal	Sample (individuals)	feature of Employment	Entrepreneur definition	Main result	Evidence
Wunnava & Ewing (2000)	SB	3625 US (‘89)	Wages	Size classes (employees)	Small firms pay lesser wages	-
Winter & Zweimuller (1999)	AA	7453 Swiss (‘91-‘96)	Wages	Size classes (employees)	Small firms pay inferior wages	-
Troske (1999)	A	129901 US (‘89)	Wages	Firm and establishment size (employees)	Small firms and establishment pay lower wages	-
Brown & Medoff (2003)	A	1067 US (‘92)	Wages	Firm age	Younger firms pay smaller wages	-
Oosterbeek & Van Praag (1995)	SB	569 Dutch (‘83)	Wages	Size classes (employees)	Small firms pay lesser wages	-
Wunnava & Ewing (2000)	SB	3625 US (‘89)	Benefits	Size classes (employees)	Small firms offer less payback	-
Cowling (2001)	SB	15800 across EU15 (‘96)	Productivity-related-pay (PRP)	Size classes (employees)	Small firms offer less PRP	-
Winter & Zweimuller (1999)	AA	7453 Swiss (‘91-‘96)	On the job search and turnover	Size classes (employees)	Small firm employees less contented	-
Frey & Benz (2003)	WP	28392 in Switzerland, U.K and Western Germany (‘84-‘00)**	Satisfaction at Job	Size classes (employees)	Small firm employees more fulfilled	+
Clark & Oswald (1996)	A	5195 UK (’91)	satisfaction at Job	Size classes (employees)	Small firm employees more satisfied	+
Overall	Entrepreneurs pay lower wages, but, nevertheless, their employees appear to be more satisfied					-

*Evidence is positive (+) if conclusion point out that entrepreneurial firms’ input is relatively large. It is negative (-) if the opposite is found and indeterminate (0) if the study does not show momentous differences between the giving of entrepreneurs and their counterparts. ** accurate numbers of individuals and years observed vary for every country for Frey and Benz (2003).

3.3. Contributions to Employment summarized

The studies on the generation of service and employment dynamics in general illustrate that entrepreneurial firms grow, proportionately, more rapidly than other firms. Moreover, in the long run, entrepreneurial firms generate encouraging externalities leading to more employment, also in other, i.e., older, larger and serving firms. Although entrepreneurs create more jobs, the jobs they create are less protected due to elevated unpredictability and higher probabilities of firm termination. Furthermore, entrepreneurs offer their employees lower compensation levels than these persons would take home if they were in employment by large firms. Moreover, employees in non-entrepreneurial firms obtain supplementary settlements and are more frequently rewarded on a performance related basis. Nevertheless, employees in entrepreneurial firms – although they earn less and face higher risks of losing their job – are more satisfied with their jobs than employees in the control group of firms. Future research might explain some of the remaining puzzles.

4.Contributions to Innovation

4.1. The Quantity and Quality of Innovations

To enumerate a firm’s innovativeness, researchers have focused on three measures that we discuss in what follows. The first is the firm’s Research and Development (R&D) expenditures. Second, the number of patents created, and third, the number of new products or technologieslaunched. The dimension of quality is connected to patent illustration rates, and the (instinctively) assessed significance of new products/technologies.R&D expenditures are considered an contribution for innovations. And since “It is said that industrial R&D, chiefly, basic research, tends to be less industrial than the socially optimal level” (Koga, 2005, p. 53), higher levels of R&D expenditure are considered valuable. Castany et al. (2005) contrast the mean R&D expenditure per employee of large and small Spanish firms (cut-off point at 200 employees) and find that large firms have allocated around 2.5 times more resources to R&D than small firms (in 1990 and 1994). In contrast, Arvanitis (1997) finds identical levels of R&D expenditure per employee for the largest part of the Swiss firm size

distribution. Based on these two studies, we can only conclude that entrepreneurs devote no more resources per employee to R&D than the control group. However, Yang and Huang (2005) find evidence that R&D expenditures provoke higher growth rates for small firms (in the Taiwan electronics sector). This would entail that each dollar spent on R&D in a small firm is more costly than a dollar spent in a large firm.Patents are used as a stand-in for a firm's level of innovations. There is convincing evidence that entrepreneurs produce fewer patents than their counterparts. Almeida and Kogut (1997) and Sørensen and Stuart (2000) find such evidence by exploring for the U.S. semiconductor and biotech industries. The gauge of innovation that is connected to new products and technologies is most often quantified based on one-sided answers from firm-managers as to whether they have introduced a new product or technology. So far, studies have examine firms from the manufacturing sector only. Love and Ashcroft(1999) find that the amount of innovations increases with plant size in Scottish plants. Huergo andJaumandreu (2004) show that the probability that a Spanish firm introduces a product or process innovation is higher for large firms (more than 500 workers) than small firms (20 or fewer workers). The difference is 37 percentage points for route innovations and 27 percentage points for product innovations. They find the same genus of affiliation between the probability of innovating and firm age. The result that larger firms (are more likely to) bring in more innovations is not prominent: Larger firms may merely have more product lines to improve upon. Love and Ashcroft (1999) use a second measure of innovativeness, i.e. innovations per employee, and find that this determine actually decreases with firm size. Hence "smaller plants are indeed more 'innovation intensive' than their larger counterparts"(Love and Ashcroft, 1999, p. 107).13 In other words, they produce innovations more efficiently.One study distinguishes between mere product improvement and fundamentally new products, i.e. Acs and Gifford (1996, US) and finds that larger firms introduce more radically new products, as a small part of total product innovations.

Arvanitis (1997) uses firm-managers' one-sided assessment of the magnitude of their firm's innovative deeds to weigh quality. Smaller firms turn out to assess their own innovative behavior as a less important contributor to economic value creation. A more objective measure of quality is patent citations (corrected for self-citations). If a patent is cited more often, it is reasonable to assume that the primary product has given rise to more patents and innovations. Sørensen and Stuart (2000) find that in the semiconductor industry the time between patent citations made by other firms than the patent holder increase with firm age. However, they do not find evidence of this (or any other) relationship between firm size and records in the biotech industry.

Based on somewhat uncertain results we conclude cautiously as follows. Entrepreneurs invest no more in innovation than their counterparts and they manufacture fewer innovations. However, the quality of their innovations may be higher and these innovations appear to be shaped more efficiently. If anything, this section shows a shortcoming in analyzing innovativeness: benchmarking the number of innovations against the size of the firm is not common.

4.2. The Commercialization of Innovations

Two measures of commercialization are used: first, (the probability of) sales from innovations in general, and second, (the probability of) gain sales given some specific innovation. Using the first measure, Brouwerand Kleinknecht (1996) conducted two analyses, both based on Dutch firm data from the early nineties. On the basis of the first analysis they reach conclusion that larger firms are more likely than smaller firms to have sales from innovative products. The second analysis reached the conclusion that smaller firms in the service sector do better than larger firms based on the share of their total sales realized with innovative products, "given that a firm has some sales of innovative products" (p. 196). However, for firms in the manufacturing sector, they find no noteworthy firm size effect. Thus, entrepreneurs in the service sector are less likely to have sales from innovative products, but if they do have such sales, they'll derive a higher fraction of their total sales from those innovative products. Hence, this is weak evidence in favor of entrepreneurs who are relatively good at commercializing their innovations. Czarnitzki and Kraft (2004) generalize this latter result based on a sample of firms with and without any sales from innovative products in seven European countries: the share of sales from innovations is higher for smaller firms. The second measure of commercialization, i.e. the generation of sales with a given innovation, is analyzed by Lowe and Ziedonis (2006) and Dechenaux et al. (2003). The first study finds that "Start-ups and established firms are uniformly likely to commercialize inventions generated by the same university department" (p. 180), whereas the second study concludes that start-ups realize a first sale faster than incumbent firms. Hence, if anything, the likelihood of realizing sales from a university invention is higher for entrepreneurs than for their counterparts. Moreover, the fee revenues received by the university from start-ups are higher than royalties received from established firms, suggesting "start-ups outperform established firms" (Lowe and Ziedonis,2006, p. 182). On the other hand, start-ups persist to pursue unproductive commercializations longer than established firms, suggesting start-ups destroy more value. In sum, we have the following observations: The likelihood of turning innovations into sales is lower for entrepreneurs, whereas their share of sales from innovations – as a fraction of total sales – in general is higher than for other firms. Entrepreneurs are also more likely to generate sales and higher levels of royalty from a given (university) invention. However, entrepreneurs were found to destroy more value through prolonging unsuccessful

commercialization strategies. Thus, the level of commercialization of entrepreneurs can be concluded to be comparatively high. Nevertheless, the economic benefit of commercialization by entrepreneurs vis-à-vis their counterparts depends on the swap between resources worn out and value created by entrepreneurs over and above that wasted and created by other firms which is unexamined

4.3. The Adoption of Innovations

The type of innovations attained by firms having been in the limelight recently is ICT-related technologies. Chandrashekaran and Sinha (1995) explore the volume and timing of 'adopting' personal computers (PCs) by 3,236 U.S. firms in 1978-1984. They find that first purchases are made earlier by smaller firms, whereas larger firms buy, obviously, larger volumes.BarNir et al. (2003) survey 150 U.S. magazine publishing firms in 2001 and find that older firms use the Internet more frequently for specific business purposes, e.g. communication with customers (see p.802). However, the difference between firms of different ages, though significant, is small. Lucchetti and Sterlacchini (2004) do not find a difference across firm sizes in the use of Internet and e-mail by nonproduction workforce in Italy, both for general applications and as a marketing tool. However, larger firms use more complicated ICT, e.g. Intranet or data-servers, more frequently than small firms (in the year 2000).In sum, smaller firms were found to adopt ICT-products earlier than large firms, but its volume and use may be independent of firm size. Small firms are less inclined to adopting high-cost innovations, such as data-servers whereas the counterparts may. Thus, entrepreneurs and counterparts are equally likely to adopt low cost innovations.

4.4. General Summary of the Contributions to Innovation

Table 4.1 shows the rather composite fallout pertaining to the input of entrepreneurs in provisions of innovation. Entrepreneurs invest no more in innovation than their counterparts and they produce fewer innovations. The quality of their innovations might be higher and these innovations seem to be produced more competently, i.e. entrepreneurs produce more patents per employee and they are cited more often. Regarding the commercialization of innovations, the levels are relatively high for entrepreneurs (in terms of the share in sales). Nevertheless, the relative benefit of commercialization by entrepreneur's vis-à-vis their counterparts are not clear yet. Furthermore, entrepreneurs and counterparts are equally likely to adopt low cost innovations, whereas the counterparts are more likely to adopt higher cost innovations. To conclude, entrepreneurs and their counterparts add equally prominently to the innovativeness of societies. However, they serve different goals in terms of quality, quantity and efficiency, as well as in terms of producing (and adopting) more radical (and higher cost) innovations. It might be appealing to note that our results are not in opposition to results obtained at the country level. Based on a panel of 36 countries, Wennekers et al. (2005) illustrate that the correlation between the extent of entrepreneurial activity in a country and a country's innovative capacity ("a country's potential to produce a stream of commercially appropriate innovations", p. 297) is positive for more developed countries such as the U.S. and Europe. Likewise, Acs and Varga (2005) find a positive relationship between entrepreneurial activity and technological adaptation observed overall in the European Union.

Table 4.1: Evidence of the Relative Contribution of Entrepreneurs to Innovation

Study	Journal Status	Sample	Measure of Innovation	Entrepreneur definition	Main finding	Evidence*
Quantity of Innovations (4.1)						
Castany et al. (2005)	WP	Spanish mnf firms, 523 in '90; 668 in 94	R&D expense/ employee	Firm size (employees)	Small firms allot less to R&D	-
Arvanitis (1997)	SB	564 Swiss mnf firms ('93)	R&D expense/ employee	Firm size (employees)	decrease with firm dimension	+
Almeida & Kogut (1997)	SB	40 US semicond. firms ('90)	Patents	Entrant	Entrants manufacture fewer patents	-
Sørensen & Stuart (2000)	M	387 U.S semicond /biotech firms, 86-92	Patenting frequency	Firm size (empl) & age	Time between patents decreases with size & age	-
Love & Ashcroft (1999)	SB	304 Scottish mnf plants ('92)	New prod./techn.	Plant size (employees)	Increases with plant size	-
Huergo & Jaumandreu (2004)	SB	2,356 Spanish mnf firms ('91-'98)	New prod./techn.	Firm size (employees)	P(introduction) higher for larger and older firms	-
Love & Ashcroft (1999)	SB	304 Scottish mnf plants ('92)	New prod. /techn. per employee	Plant size (employees)	# per employee decreases with plant size	+
Acs & Gifford (1996)	SB	632 US firms ('82)	% radical innovations	Firm size (employees)	Measure increases with firm size	-
Quality of Innovations (4.1)						
Arvanitis (1997)	SB	564 Swiss mnf firms ('93)	Importance of innovations	Firm size (employees)	Measure decreases with firm size	-
Sørensen & Stuart (2000)	MJ	387 U.S semicond and bio firms ('86-'92)	Patent citations	Firm size (empl.) & age	Time between patent citations increases with size & age, in semicond ind.	+
Commercialization of Innovations (4.2)						
Brouwer & Kleinknecht ('96)	SB	3784 Dutch ('92) mnf/service firms	P(sales with innovations)	Firm size (employees)	Increases with firm size	-
			Share of sales from inn.	Firm size (employees)	Decreases with firm size	+
Czarnitzki & Kraft (2004)	SB	474 firms (97-99, 7 EU countries, 5 ind)	% sales from innovations	Firm size (employees)	Measure decreases with firm size	+
Lowe & Ziedonis (2006)	M	734 university inventions (81-99)	P(sales given innovation)	Entrant	Measure equal for entrants and incumbents	0
Lowe & Ziedonis (2006)	M	734 university inventions (81-99)	Generated royalties	Entrant	Entrants generate more royalties	+
Dechenaux et al. (2003)	SB	805 university inventions (80-96)	Time until first sale	Entrant	Entrants make first sale with invention faster	+
Adoption of Innovations (4.3)						
Chandrashekaran & Sinha (1995)	A	3236 US firms ('78-'84)	Time/volume PC-adoption	Firm size (employees)	Smaller firm adopts quicker but lower volume	+/-
BarNir et al. (2003)	SB	150 US publishing firms ('01)	Use of internet	Age	Older firms use Internet a little more	0
Lucchetti & Sterlacchini (2004)	SB	168 Italian mnf firms ('00)	Use of internet/e-mail	Firm size (employees)	Measure not related to firm size	0
Lucchetti & Sterlacchini (2004)	SB	168 Italian mnf firms ('00)	Use of high-cost ICT	Firm size (employees)	Use of high-cost ICT increases with size	-
Overall	Entrepreneurs contribute equally importantly to innovation but through different aspects					0

*Evidence is positive (+) if findings indicate that entrepreneurial firms' contribution is relatively large. It is negative (-) if the opposite is found and indeterminate (0) if the study does not show significant differences between the contribution of entrepreneurs and their counterparts.

5. Contributions to Productivity and Growth

The contributions of entrepreneurs to productivity and growth are measured by their relative contribution to components of GDP, i.e. total value added, and labor and factor productivity. A distinction is made between

contributions to the level of GDP (Section 5.1) and the growth of GDP (Section 5.2).

5.1. Levels of Value Added and Productivity

A straight measure of contributions to a country's GDP is a firm's value added, since GDP is the sum of the amount of value added per firm, summated over all firms. The second main indicator is related to the effectiveness of production or the contribution to GDP per worker, i.e. labor productivity. Total factor productivity (TFP) is used as the final pointer. It is often referred to as the 'residual' or the indicator of "technical progress" and is defined as output per unit of capital and labor combined.

The relationship between entrepreneurship and levels of value extra (unlike growth of value added) has been little studied and is not very insightful since value added is a type of size measure. Thus, the contribution of entrepreneurial firms (often small) to value added will be lower than for other firms.The majority of the studies with respect to the value of labor productivity show that entrepreneurs have lower – or, at least, no higher values of labor output – than their counterparts. Disney et al. (2003) is the only study providing evidence that the labor productivity of entrepreneurial firms is relatively high: UK manufacturing establishment younger than 1 year, i.e. entrants, have an average annual labor productivity (output per person hour) that is 2.4 percent higher than for incumbent establishments, and 5 percent higher than for exiting establishments.On the opposite, Brouwer et al. (2005, Netherlands) relate Dutch manufacturing firms' value added and gross output to the cost of labor and find that both ratios augment with firm size. Thus, entrepreneurs appear to have lower average levels of labor productivity than their counterparts. Foster et al. (2006, US,retail trade sector) contrast labor productivity levels of entrants, incumbents and exiting firms. Their results show that exiting establishments are far less productive than entering establishments, and entering and incumbent establishments have similar productivity levels. However, due to a major reorganization trend in the sector and period studied, "Among entering establishments, the establishments associated with a national chain have a very large productivity advantage relative to single unit incumbents" (p. 754)and single unit entrants. Therefore, national chains are likely to drive the average productivity of entrants up to a point where this group's productivity is insignificantly different from incumbent firms. Thus, although Foster et al. do not examine this, truly entrepreneurial entrants may be less productive than the other firms. Finally, Jensen et al. (2001) acknowledge several difficulties obscuring a contrast of productivity levels across plants of different ages. In fact, there are three different effects on productivity as plants grow older. The first is the positive age or experience outcome, i.e. older plants are more productive due to the management accumulating experience, gains from learning by doing, or the achievement of economies of scale. Second, older plants are more productive due to survival: Samples of young plants include potential thriving as well as potential failing plants, whereas samples of older plants are self-selected based on performance. Hence, the selection effect based on survival biases the results from a comparison of the productivity of younger and older plants in favor of older plants. Third, there is a possibly offsetting off-putting 'vintage' effect: The best-practice technologies are in material form in new capital, i.e. start-up plants. Hence, younger plants in a given year embody more productive technologies. They distinguish these three effects empirically and find that all three are sizeable. First, age has a positive effect on productivity, i.e. surviving plants improve their relative standing in the productivity delivery as they age. Second, selection matters. "Recent entrants show productivity levels below industry averages, but this is largely due to a large number of small, low-productivity plants that subsequently fail. Rapid failure of these plants leaves behind larger, high-productivity survivors" (p. 332). Third, vintage matters: "Newplants embody better production technology and, even after controlling for labor quality and capital intensity, show higher productivity than do earlier associates of entrants" (p. 332). Taken together, the effects entail a relatively low contribution of younger firms to labor productivity: Productivity increases significantly with plant age. However, once the quality of labor (using the cohort of entrants' average wages per hour worked as a proxy) and capital concentration are controlled for, productivity differentials with respect to age become immaterial. This implies that the differentials between older and younger plants may be due to older plants employing advanced quality labor or having higher capital intensity. The conclusion might perhaps be generalized to explaining the results by Brouwer et al. (2005) that show that bigger (instead of older) firms are more productive than smaller (instead of younger) firms. Jensen et al. (2001) confirm the implicit irrelevance of whether plant age or plant size is studied. The results described, pertaining mostly to manufacturing firms in various countries and time periods, are rather mixed, but mostly not in support of relatively high levels of entrepreneurs' labor output.Total Factor Productivity (TFP) has been considered an important ingredient of a firm's or nation's production purpose ever since Solow (1957) introduced the concept as an indicator of the effect of technical change on productivity and a driver of economic growth. It is the multiplier A in the production function, here shown in Cobb-Douglas form with two inputs, i.e. capital input (K) and labor input (L):

$$Y = A \times K^{\alpha} \times L^{1-\alpha}$$

The level of A is a measure of the efficiency of the use of production factors, whereas the change in Aover time measures efficiency changes. Experiential studies on the differences between entrepreneurial and non-

entrepreneurial firms with respect to TFP deliver unclear results. Disney et al. (2003) find that entrants have higher average TFP levels than incumbents and exiting establishments, i.e. 3.9% and 9.4%respectively. Castany et al. (2005, Spain) show that the mean TFP levels of large (older) firms are(slightly) notably higher than of small (younger) firms. The differences between the results of Disney et al. in favor of young firms and these of Castany et al. (2005) in favor of larger and older firms can possibly be traced back to the fact that Castany et al. exclude firms with fewer than 10 employees. Since entrants start out small, Castany et al. could have excluded the firms Disney et al. found to be most productive. Brouwer et al. (2005, Netherlands, manufacturing) confirm the results by Castany et al.Moreover, Nguyen and Lee (2002, US, manufacturing) find that the returns-to-scale with respect to multiple factors is identical and constant for all size classes. Hence, their work supports "the proposition that small establishments are as efficient as huge establishment" (p. 48). We conclude that TFP levels of entrepreneurs are not different from or lower than those of their counterparts. The conclusion about the input to the levels of productivity of entrepreneurs comparative to their counterparts, as indicated by labor and total factor productivity, are not clear cut. The mixed results tend to indicate that entrepreneurs have no advanced, and probably lower, levels of productivity than their counterparts. Differences between entrepreneurs and their counterparts are insignificant (or attributable to specific factors) in many cases. Table 5.1 shows an overview of the results.

Table 5.1: confirmation of the Relative role of Entrepreneurs to Levels of Productivity

Study	Journal	Sample	Measure of Value	Entrepreneur definition	Main finding	Evidence*
Labor Productivity						
Brouwer et al. (2005)	WP	4566 Dutch mnf firms ('99)	value added/ wage bill AND Gross output /wage bill	Firm size (wage bill)	Size relates positively to labor prod.	-
Disney et al. (2003)	A	142722 UK mnf establ ('80-'92)	Output/person hour	Entrants: firms < 1 year	Age relates negatively to labor prod	+
Jensen et al. (2001)	A	200000 US mnf plants ('63-'92)	Value added/hours worked	Plant age	Age relates pos. to labor prod. (unless controlled for labor quality and capital intensity	-/0
Foster et al. (2006)	A	1,5m US retail establ ('87-'97)	Output/hours worked	Entrant: plants	Prod. similar for incumbents and entrants (chains)	-/0
Total Factor Productivity						
Disney et al. (2003)	A	142722 UK mnf establ ('80-'92)	Firm TFP level	Entrants: establishments < 1 year	Age relates negatively with TFP	+
Castany et al. (2005)	WP	Spanish mnf firms (523 in 90, 668 in 94)	Firm TFP level	Firm size (small is 10-200 empl) and Age	Small and young firms have lower TFP levels	-
Brouwer et al. (2005)	WP	4566 Dutch mnf firms ('99)	(Value added)/ (cost of factor inputs)	Firm size (wage bill)	Size relates positively to value	-
Nguyen & Lee (2002)	SB	10318 US mnf plants ('91)	Elasticity of output to all factor inputs	Plant size (employees)	No relation with size	0
Overall	Entrepreneurs do not have higher productivity levels than their counterparts					-/0

*confirmation is positive (+) if findings indicate that entrepreneurial firms succor' is relatively large. It is negative (-) if the opposite is found and indeterminate (0) if the study does not show significant differences between the assistance of entrepreneurs and their counterparts.

One important point remains to be debated: The studies examined in this section use two dissimilar observation-levels, i.e. individual firms and individual plants/establishments, possibly leading to problems in inferring and reconciling from the results. That is, our observations are gained from six unique studies of which four are based on samples of individual plants and two of firms. When observing plants, it is not clear whether the plant is operated by an entrepreneur, i.e. a single owner-manager, or is a subsidiary of a larger, non-entrepreneurial firm. Thus, studies perceiving plants produce results that may not applicable to entrepreneurs. The two studies at the firm level that therefore applies to our definition of the entrepreneur find results that are not in favor of a relatively large assistance of entrepreneurs to yield. One of the plant-observing studies, i.e. Foster et al. (2006), allows a peculiarity amid single unit plants/establishments, and plants/establishments belonging to a larger group, where the former obviously has close similarity to our notion of entrepreneurs. They find that the higher levels of labor productivity associated with entrants are mainly caused by the group of entrants that belong to a chain in the retail trade sector studied. Hence, based on this result we could ultimately degrade all results pertaining to analyses at the establishment level. Though, the study by Foster et al. (2006) pertains to the retail trade sector, whereas the most commonly studied sector in this area is the manufacturing sector where chains are not as dominant in general and not among entrants in particular.

5.2. Growth of Value Added and Productivity

In general, researchers have shown more interest in the examination of the enlargement of value added and productivity than in the analysis of their levels. Growth of value added has been studied at the firm level (Brouwer et al., 2005; Rodriquez et al., 2005) and at more aggregated levels (Baldwin, 1998; Carree, 2002; Robbins et al., 2000; Carree and Thurik,2007). By and large, the results show that the entrepreneurs' growth of value added is relatively high. At the firm level, Brouwer et al. (2005) show that the growth rates in productivity, in terms of output and value added relative to the costs of the factors of production, decrease with firm size, i.e., smaller firms have advanced efficiency growth rates. Rodríguez et al. (2003, Spanish Canary Islands) use the framework of Gibrat's Law and corroborate this result. Based on aggregated data, Baldwin (1998, Canada, manufacturing) shows increasing shipment shares of the smallest size class at the cost of those of larger size classes. Hence, economic activity has been shifted towards small firms (possibly without any actual growth of total shipment value, i.e. GDP).Whether the effect of such a change is positive in terms of economic value added, depends on the relative performance of small versus large firms and the performance improvement of large firms due to the improved competitiveness as a consequence of more small firm commotion. Audretsch et al. (2002) have studied the liaison between size class shares and economic growth and undeniably find a positive effect of a larger small size class. Robbins et al. (2000) present direct support of the comparatively large contribution of entrepreneurial firms to value added growth, also based on aggregated data and accounting for possible spillovers between large and small firms. By affecting productivity growth positively, the smallest businesses provide a relatively large indirect contribution to the growth of a state's value added.18 Carree (2002) supports this result by showing that increases in large firm employment shares lead to lower value added index changes. Thus, "on average, a shift towards small units has led to increased growth" (p. 248). Carree and Thurik(2007) relate the growth of the number of business owners as a percentage of the labor force to (national) GDP growth. They establish that the initial effect on GDP growth of a higher business possession rate is positive and there is no significant evidence of business ownership having an indirect effect later on. Thus, entrepreneurs' production value grows relatively fast in contrast to the control group according to all six studies. These explicit results have been found while using a definition of the entrepreneur based on firm size or new business formation and based on micro as well as macro data, where the latter incorporate spillover effects of entrepreneurial firms on their counterparts. With respect to labor productivity growth, the results, also pivotal on six – largely the same – studies, are more mixed. Three studies are based on aggregated data (Baldwin, 1998; Robbins et al., 2000; Carreeand Thurik, 2007), whereas three studies are based on micro-data, one at the firm level (Brouwer et al.,2005), and two at the establishment level (Disney et al., 2003; Foster et al., 2006). Baldwin (1998) shows indirect evidence that the entrepreneurs' relative labor productivity has shrunk during the period of his study, implying that the growth in productivity was smaller than that of the control group. Baldwin does not include possible spillover effects of small firms on large firms in his results. Robbins et al. (2000) examine the relationship between the employment share of small businesses and a measure of labor productivity growth both defined at the (U.S.) state level (and including possible spillover effects). Their result is opposite to Baldwin's; possibly due to large brim over effects. Carree and Thurik (2007) study to what extent and when, i.e. short versus long term, direct and indirect influences of new business creation are rendered into increased labor productivity growth. They find evidence of a direct immediate (marginally significantly) positive effect. A longer term effect is insignificant. Based on micro-data, Brouwer et al. (2005) support the result that the productivity of small firms grows faster than of large firms. Disney et al. (2003) molder industry-wide labor productivity growth –based on individual establishment data – into 1) growth due to incumbent establishments increasing their labor productivity, so called 'inner restructuring', and 2) growth due to the entry and exit of establishments, i.e. the sum of the hammering of labor productivity due to establishments exiting and the gain in labor productivity due to entrants, the so called 'external restructuring'. Disney et al. find that effects 1) and 2) are each responsible for around 50% of industry-wide productivity growth. Given that entrants are a small fraction of all establishments scrutinized, we infer that entrants have a relatively high donation to labor productivity growth. Foster et al. (2006) find that "net entry accounts for nearly all of the labor productivity growth in retail trade." (p. 757). However, besides showing that establishments belonging to large chains have the highest productivity levels (see Section 5.1.), Foster et al. show that "Much of the contribution of net entry to overall productivity growth is connected with the dislodgment of single-unit establishments by the entry of highly productive establishments from national chains." (p. 757).Hence, their evidence might not relate to our notion of an entrepreneur. To conclude, the evidence suggests, though not unambiguously, that labor productivity growth is higher in entrepreneurial firms than in other firms.21 Both studies based on micro and macro data show that the effect of increased entrepreneurial activity engenders labor productivity growth. As in the previous section, a remark is in order. Whereas one of the three micro studies using firm specific data distinguishes entrepreneurs from others based on firm size, two of the three studies distinguish entrants from incumbents/exits and do so based on analyses of establishments rather than firms. Hence, these entrants possibly belong to incumbent (and large scale) chains. Both of the studies, i.e. Foster et al. (2006) and Disney et al. (2003), acknowledge that the contribution in productivity growth of entrants is mainly due to entering establishments of larger chains. This

does not correspond to our notion of the entrepreneur.

The growth of Total Factor Productivity (TFP) represents growth in manufacture due to a more efficient use of production factors. Three micro-studies have measured the relative input of entrepreneurs to TFP growth, two of these for the Spanish manufacturing sector. Callejon and Segarra (1999) show that both entry and exit rates supply positively to the growth of TFP in industries and regions. This leads thus to the conclusion that entrepreneurial activity is related positively to TFP growth. Castany et al. (2005) show that the growth rates of TFP levels in Spanish manufacturing firms appear rather similar for small and large firms. Their evidence is (only) based on descriptive data. Using more advanced statistical methods, Disney et al. find that establishment entry (net of establishment exits) is responsible for 80% to 90% of industry-wide TFP growth. Thus, entrepreneurs would have very high contributions to TFP growth. However, as was the case with labor productivity, the effect of net entry is dominated by establishment groups, contributing three times more to TFP growth than single-unit establishments. We conclude that, if anything, entrepreneurs contribute to TFP growth in consistent ratios.

Based on the entire outcome described in this section, we conclude that entrepreneurs experienced higher growth in production value and labor productivity than their counterparts, see Table 5.2. The evidence for growth in TFP levels is meager. The results pertaining to studies where the definition of the entrepreneur is a new incoming plant or establishment should be interpreted with great vigilance since entrants can belong to existing large chains and this group of entrants turns out to experience relatively high growth, but is not essentially entrepreneurial.

Table 5.2: Evidence of the Relative Contribution of Entrepreneurs to Growth of Economic Value

Study	Journal	Sample	Measure of Value	Entrepreneur definition	Main finding	Evidence*
Growth of Value Added						
Brouwer et al. (2005)	WP	4566 Dutch mnf firms (‘99)	(i) Value added; (ii) Value added/cost of factor inputs	Firm size (wage bill)	Size relates negatively to value growth	+
Rodríguez et al. (2003)	SB	1092 Spanish firms (‘90-‘96)	Value added	Firm size (employees)	Size relates negatively to value growth	+
Baldwin (1998)	SB	Canadian mnf plants (‘73-‘92)	Shipment shares	Firm size classes (empl.)	Small firms relative shipment share increased	+/0
Robbins et al. (2000)	SB	48 US states (‘86-’95)	Gross state product growth	Empl. share of (i) firms< 20 empl. and (ii) firms< 500 empl.	GSP growth indirectly related positively to small firm share only if small is defined as <20 empl	+
Carree (2002)	SB	26 mnf industries 5 countries	Change in value added index ‘77-’90	(inverse) change in large firm	A shift towards small firms leads to increased growth	+
				(+500) share of empl		
Carree & Thurik (2007)	SB	21 OECD countries (‘72-‘02)	National GDP growth	Changes in business ownership rates	Higher start-up rates lead to direct GDP growth, not indirect in the long run	+
Growth of Labor Productivity						
Baldwin (1998)	SB	Canadian mnf plants (‘73-‘92)	Shipment share/ employment share	Firm size classes (empl)	Relative labor prod. has decreased for small plants	-/0
Robbins et al. (2000)	SB	48 US states (‘86-‘95)	Gross state product/empl.	Empl share of (i) firms< 20 empl. and (ii) firms< 500 empl.	Labor prod. is related positively to small firm share if small is <20 empl	+
Brouwer et al. (2005)	WP	4566 Dutch mnf firms (‘99)	Value added/wage bill AND Gross output/wage bill	Firm size (wage bill)	Size relates negatively to prod. growth	+
Disney et al. (2003)	A	142722 UK mnf establ (‘80-‘92)	Output/person hour	Entrants: plants < 1 year	Entrants have a large effect on industry-wide labor prod. growth	+
Foster et al. (2006)	A	1,5m US retail establ (‘87-‘97)	Output/hour worked	Entrants	Entrants (together with exiting establ.) have a large effect on labor prod.growth	-/0
Carree & Thurik (2007)	SB	21 OECD countries (‘72-‘02)	National GDP growth/labor	Changes in business ownership rates	Higher start-up rates lead to direct labor prod. growth, not indirectly in the long run	+
Growth of Total Factor Productivity (5.2.3)						
Disney et al. (2003)	A	142722 UK mnf establ (‘80-‘92)	Firm TFP / industry wide TFP growth	Entrants: firms < 1 year	Entrants affect industry-wide TFP growth pos.	+
Castany et al. (2005)	WP	Spanish mnf firms, 523 in 90, 668 in 94	Firm TFP level	Firm size (small is 10-200 emp) and Age	Small and large firms have similar TFP growth	0
Callejon & Segarra (1999)	SB	13 Spanish mnf ind. in 17 regions (‘80-’92)	Industry/region/year TFP level	Firm entry and exit rates	Firm entry and exit related positively with TFP growth	+
Overall	Entrepreneurs contribute more than their counterparts to growth of value added and productivity					+

*Evidence is positive (+) if findings indicate that entrepreneurial firms’ contribution is relatively large. It is negative (-) if the opposite is found and indeterminate (0) if the study does not show significant differences between the contribution of entrepreneurs and their counterparts.

6. Utility

This section will deal with whether individuals, given their individual characteristics, are better off being self-employed or an business owner (i.e., entrepreneurs) than being wage-workers. ‘Better off’ is understood as having a superior utility level, and the indicators used are remuneration levels (Section 6.1), remuneration inequality and volatility (6.2) and job satisfaction (6.3).

6.1. Remuneration Levels

An perceptive contrast of the levels of ‘incomes’ of entrepreneurs relative to employees requires dealing with various measurement issues (see Parker, 2004, pp. 14-16). Three different measures of entrepreneurs’ incomes are compared to employees’ incomes: (i) net profit; (ii) a periodic wealth transfer from the firm to the

entrepreneur, much like a regular wage, labeled 'draw', and (iii) draw plus changes in the firm's equity value (Hamilton, 2000). However, just comparing mean levels does not suffice, as the distribution of entrepreneurs' incomes is very different from the distribution of employees' incomes. The variance is larger and the distribution is more slanted, see below. Due to the occurrence of some 'superstar 'entrepreneurs, "mean earnings may not characterize the self-employment returns of the majority of business owners." (Hamilton, 2000, p. 605). Therefore, comparisons based on averages are likely to produce diverse results from those based on medians or other quintiles of the income distribution. Another issue, which has not been addressed much, but has been widely recognized, is that entrepreneurs'incomes relative to those of employees may be under-estimated due to underreporting (Feldman andSlemrod, 2007; Parker, 2004) or overestimated due to omitting negative incomes from empirical studies(Van der Sluis and Van Praag, 2007).Hamilton (2000) is, in fact, the only study in our sample that analyzes the income differentials between entrepreneurs and wage employees very systematically (for the three different measures of entrepreneurial income, as well as for various quintiles of their distributions) for a broad sample of theU.S. male population. His results show that entrepreneurs have lower median incomes than employees, i.e. that entrepreneurs "have both lower initial earnings and lower earnings growth than in paid employment, implying a median earnings differential of 35 percent for individuals in business for 10 years." (p. 604).The differences are smaller (or even of the opposite sign, dependent on the definition of entrepreneurial income) when average income levels are compared. The negative relative income for entrepreneurs is supported by the more recent findings of Kawaguchi (2002). Hamilton shows convincingly that the differential cannot be explained by the selection of low-ability employees into self-employment and is similar for three alternative measures of self-employment earnings and across industries. On average, entrepreneurs would benefit from higher incomes and higher growth rates of their incomes had they switched to employment. The upper quartile of the entrepreneurs' income distribution forms the exception. "Overall, it appears that many workers are willing to enter and remain in self-employment despite getting returns significantly below their substitute paid employment wage." (p. 606). Hamilton concludes that "The non-pecuniary benefits of self-employment are substantial: Most entrepreneurs enter and persist in business despite the fact that they have both lower initial earnings and lower earnings growth than in paid employment."(p. 606).Rosen and Willen (2002), on the opposite, find that entrepreneurs given their educational level and controlling for personal distinctiveness including gender, have higher mean and median income levels than wage-workers. Fairlie (2005) corroborates this results for male youth from disadvantaged families in the U.S. based on average income levels (and the profit definition of entrepreneurial incomes).Fairlie controls for unobserved heterogeneity in individual characteristics by evaluating a (individual) fixed effects model. Holtz-Eakin et al. (2000) analyze the mobility of individuals in the income allotment. They endeavor to predict the change in the individual's percentile position, conditional upon being self-employed or a wage-worker. Among the low-earning individuals, the self-employed experience higher income growth than wage workers, keeping characteristics constant. In contrast, among the top-earning individuals, thyself-employed experience smaller income growth than wage-workers. This suggests that the individual's benefit from being self-employed depends on her initial income. This result is in line with the combination of Hamilton's and Fairlie's findings. However, the study's basic model may produce a "regression-to-themean"effect (as noted by Holtz-Eakin et al., 2000 and Pannenberg and Wagner, 2001) Van der Sluis et al. (2006) guesstimate income equations for a combined panel sample of entrepreneurs and employees from the U.S. population (NLSY). By including interactions of one's occupational status,i.e. entrepreneur or employee, with all the usual control variables in the (log hourly) income equation, they allow the returns to various characteristics to be different for entrepreneurs and employees. The remaining unexplained differential in average incomes between entrepreneurs and employees turns out insignificantly different from zero. Based on the same dataset, Hartog et al. (2007) estimate income equations for entrepreneurs and employees in order to quantify the returns to (various kinds of) intelligence and ability for entrepreneurs vis-à-vis employees. Before allowing the returns to the various kinds of intelligence, ability and education to differ between entrepreneurs and employees (again by including interface terms), they find that entrepreneurs earn approximately nine percent lower incomes than employees, on average. However, as soon as they allow the returns to these measures of human capital to differ between the groups, the unsolved difference between entrepreneurs' and employees' income turns out insignificant.In squat, entrepreneurs in the U.S. seem to earn lower median incomes than wage employees. However, for the upper and lower parts of the income distribution, the differences can be positive. Average incomes seem to be of comparable levels for entrepreneurs and employees in regression frameworks that allow the returns to broad sets of indicators of human capital to differ across entrepreneurs and employees. Entrepreneurship might be good for social mobility and for becoming a 'super income earner'.

6.2. Payment Inequality and Volatility

One of the stylized facts in the economics of entrepreneurship is that the division of entrepreneurs' incomes is much less equal, i.e. has a higher inconsistency, than the income distribution of wage-employees. Descriptive statistics of the income distributions of entrepreneurs and employees (mostly in terms of their averages and variances) in numerous studies have supported this claim (see Parker 2004 and all studies mentioned in the

previous section). In most studies, negative incomes are equated to zero (Van der Sluis and Van Praag, 2007, Parker, 2004). Since entrepreneurs' incomes can be depressing, whereas this is unworkable for wage workers, this would only add to the difference in variance already observed. Hence, income dissimilarity and vagueness is higher for entrepreneurs than for employees. However, it should be noted that this observation is based on an unconditional comparison of cross-sectional variances. To review income vagueness for individual labor market participants, insight should be obtained in the variance of income over time for a given individual, i.e. income instability. Carrington et al. (1996) investigate how entrepreneurs' and wage-workers' hourly incomes are affected by changes in the unemployment rate and GNP, i.e. events associated to systematic risk. Based on a large sample of individuals in the U.S. observed from 1967 to 1992, the authors conclude that the incomes of entrepreneurs are notably more responsive to both decreases and increases in the GNP and the unemployment rate, ceteris paribus. This is consistent with relatively risky entrepreneurial incomes. This conclusion is supported by Van der Sluis et al. (2006) and Rosen and Willen (2002) who evaluate whether entrepreneurial incomes are more risky for a given individual in terms of variances in incomes over time conditional on a broad set of individual characteristics. Thus, entrepreneurial incomes are riskier and more unpredictable than the incomes of employees, for otherwise identical individuals.

6.3. Job contentment

Job satisfaction scores are important indicator of usefulness levels. Blanchflower and Oswald (1998) show in their influential article "What makes an entrepreneur?" that (i) entrepreneurs are significantly more content with their work than wage workers on average; (ii) Entrepreneurs are significantly more satisfied with their work, controlling for various individual and work-related characteristics; (iii) The same holds for 'life satisfaction'. Their contentment data and findings pertain to the U.S.Benz and Frey (2003) executes a similar study pertaining to various countries and time periods and reach the matching conclusion. They study the causes of job satisfaction by incorporating many job characteristics into the regressions. The difference in satisfaction levels between entrepreneurs and employees decreases, or even becomes insignificant, upon including controls for the individuals 'evaluation of job content and self-sufficiency. We can infer that entrepreneurs are more pleased, mainly due to them having more interesting jobs and/or more autonomy. Hence, these results jointly provide some evidence that entrepreneurs get higher utility than employees. But as Blanch flower and Oswald state "One caveat should be borne in mind when interpreting this study's findings. It may be that reported approval levels are subject to important biases. For example, self-employed people may be essentially more optimistic and cheerful than others." (p. 49).Frey and Benz (2003) concentrate on this review, by studying changes in fulfillment levels for individuals who change employment position, i.e. from entrepreneur to employee and vice versa or from job to job in wage employment for the U.K. and Western Germany. Individuals flowing into self-employment are more content than those flowing out of self-employment. Furthermore, those becoming entrepreneurs are also more satisfied than wage-workers that change their job (but remain wage-workers). Hence, these results, unaltered by unnoticed individual differences, such as the extent of cheerfulness or sanguinity, are also encouraging of higher satisfaction levels for entrepreneurs than for employees.

6.4. Summary of Utility Levels

The main question posed was: Is an individual with a given set of characteristics better off being an entrepreneur? The answer is interesting. Although entrepreneurs have lower median incomes, that aremore volatile and less secure, they are more satisfied with both their jobs and their lives. Table 6.1provides an overview.

Table 6.1: Evidence of the Relative Contribution of Entrepreneurship to Utility

Study	Journal	Sample	Aspect of Utility	Main finding	Evidence*
Remuneration Levels (6.1)					
Hamilton (2000)	AA	8771 US male indiv. (‘84)	Median incomes	Entrepreneurs have lower incomes levels	-
Hamilton (2000)	AA	8771 US male indiv. (‘84)	Median income growth	Entrepreneurs have lower income growth	-
Kawaguchi (2002)	WP	2661 US male indiv. (’85-‘98)	Median income	Entrepreneurs have lower incomes	-
Fairlie (2005)	SB	12686 US indiv. (‘79-‘98)	Average income	Male (disadvantaged) entrepreneurs earn more	+
Rosen & Willen (2002)	WP	10533 US indiv. (‘68-‘93)	Average income	Entrepreneurial income is higher	+
Holtz-Eakin et al. (2000)	SB	5000 US families (‘69-‘90)	Mobility in income distrib.	Difference depends on initial income level	0
Van der Sluis et al. (2006)	WP	US 3000 indiv. (’79-‘01)	Average income	Controlling for unobserved heterogeneity, no difference	0/-
Hartog et al. (2007)	WP	US 3000 indiv. (‘79-‘01)	Average income	Controlling for unobserved heterogeneity, no difference	0/-
Remuneration Volatility (6.2)					
Carrington et al. (1996)	A	29000 US indiv. (‘67-‘92)	Sensitivity of income to economic indicators	Entrepr. income more responsive	-
Van der Sluis et al. (2006)	WP	3000 US indiv. (’79-‘01)	Income volatility	Entrepreneurial income has higher variance over time	-
Rosen & Willen (2002)	WP	10533 US indiv. (68-‘93)	Income volatility	Entrepreneurial income has higher variance	-
Job Satisfaction (6.3)					
Blanchflower & Oswald (1998)	A	7874 UK indiv. (’81)	Job satisfaction scores	Entrepreneurs more satisfied	+
Benz & Frey (2003)	WP	9332 indiv. in W-Europe and N-America (‘97)**	Job satisfaction scores	Entrepreneurs more satisfied	+
Frey & Benz (2003)	WP	28392 indiv. in Switzerland, U.K and W. Germany (‘84-‘00)**	Job satisfaction scores	Becoming self-employed has a more positive effect than becoming a wage-worker	+
Overall	Despite having lower and riskier incomes, entrepreneurs are more satisfied				0

*Evidence is positive (+) if findings indicate that entrepreneurial firms’ contribution is relatively large. It is negative (-) if the opposite is found and indeterminate (0) if the study does not show significant differences between the contribution of entrepreneurs and their counterparts. ** Precise number of individuals and years observed differs per country/region.

What could explain this result? Do entrepreneurs severely underreport their incomes (Feldman and Slemrod, 2007; Parker, 2004)? Do entrepreneurs not mind that their incomes are more unpredictable because they are less risk averse? This cannot be the entire explanation since switchers into entrepreneurship gain more satisfaction than switchers in the opposite direction (Frey and Benz, 2003). Does entrepreneurship require start-up resources that many people are not able to acquire (e.g., Astebro and Bernhardt, 2005)? Does entrepreneurship bring so much non-pecuniary payback? These questions require more research.

7. Conclusion

We have reviewed the fruits from twelve years of high quality pragmatic research into the economic value of entrepreneurship. The research reviewed was selected based on precise rules such that statistical measurement of the relative benefits to the creation of economic value by entrepreneurs is enabled. Entrepreneurs or entrepreneurial firms are defined as small firms, young firms, entrants or self-employed. Their counterparts are defined as bigger firms, older firms, current firms or wage employees, correspondingly. At a more aggregated level, these definitions of entrepreneurship translate into the share of small or young firms, the number of entering firms as compared to the number of employees or incumbent firms in a region or country, and the rate of self-employment. Monetary benefits are defined in terms of employment generation and dynamics, innovation, productivity and growth, and the creation of utility. The picture that emerges, both about the state of research and the results, is scattered.

The sample consists of 57 studies that analyze 87 dealings between entrepreneurship and economic outcomes. This sample size, in grouping with the great variety of indicators of economic outcomes, countries, time periods and industries that have been studied, while using various definitions of the entrepreneur, does not (yet) allow a

authentic meta-analysis. The small number of studies might be due to our strict necessities in terms of (journal) excellence and the required overt comparison between entrepreneurs and some control group. Nonetheless, our study has resulted in, rather complex, answers to the question: 'What is the economic value of entrepreneurs?' Table 7.1 serves as a guideline

Table 7.1: Overview of the Results

Category	SpecificationofCategory	sub-category	studies	positive	zero	negative
Employment	EmploymentQuantity	Employmentcreation	15	14	0	1
Employment	EmploymentQuantity	Employmentdynamics	2	0	0	2
Employment	EmploymentQuality	Wagelevels	5	0	0	5
Employment	EmploymentQuality	Benefits	2	0	0	2
Employment	EmploymentQuality	Jobsatisfaction	3	2	0	1
Innovation	InnovationsQuantity	R&Dexpensesper employee	2	1	0	1
Innovation	InnovationsQuantity	Number/incidenceofpatents	2	0	0	2
Innovation	InnovationsQuantity	Newproductsandtechnologies	2	0	0	2
Innovation	InnovationsQuantity	Newproductsandtechnologies/employee	1	1	0	0
Innovation	InnovationsQuantity	Percentageofradicalinnovations	1	0	0	1
Innovation	InnovationsQuality	Self-assessedsignificanceofinnovations	1	0	0	1
Innovation	InnovationsQuality	Patentcitations	1	1	0	0
Innovation	Commercializationof innovations	Commercializationofinnovations	6	4	1	1
Innovation	Adoptionof innovations	taking upof innovations	5	1	2	2
ProductivityandGrowth	Value	Laboryield	4	1	0	3
ProductivityandGrowth	Value	TotalFactorefficiency	4	1	1	2
ProductivityandGrowth	Growth	Growthof Valuesupplementary	7	6	1	0
ProductivityandGrowth	Growth	Growthof LaborProductivity	7	5	0	2
ProductivityandGrowth	Growth	Growthof TotalFactorProductivity	3	2	1	0
Utility	RemunerationLevels	RemunerationLevels	8	2	1	5
Utility	RemunerationVolatility	RemunerationVolatility	3	0	0	3
Utility	Satisfaction	Satisfaction	3	3	0	0
Total			87	44	7	36

Employment

Entrepreneurs create more employment than their counterparts, relative to their size. This remains true when one accounts for the higher firm disbanding rate among entrepreneurial, i.e., young and small firms, which destroys jobs. Indeed, the net giving of entrepreneurs to employment creation relative to their counterparts is positive. However, the net job creation of entrepreneurs goes along with a relatively high job destruction rate, leading to less job security and a more volatile process of employment creation. Hence, entrepreneurs do create more jobs, but they do so in a rather dynamic way, which is disadvantageous for the stability of the labor market. Another important aspect of entrepreneurial activity is the effect of new firm creation on the employment creation of incumbents. Evidently suggesting convincingly that there is a positive long term effect of more entrepreneurial activity on labor demand, also by non-entrepreneurial firms.

Innovation

Entrepreneurs do not fritter more on R&D than their counterparts. They manufacture smaller number patents, new products and technologies. Moreover, the percentage of essential innovations is lower among entrepreneurial firms. However, the competence with which innovations are produced seems to be higher and so is the quality of innovations as measured by the number of patent credentials. Entrepreneurs commercialize innovations to a larger extent, but score lower on the adoption of innovations than their counterparts

Productivity and Growth

The relative contribution of entrepreneurs to the value of productivity levels is low. This holds for both labor and total factor productivity. However, entrepreneurs show relatively high growth rates of value added and output

Utility

The majority of entrepreneurs would earn higher incomes as wage employees. The mean incomes of entrepreneurs can reach quite high levels due to some 'superstar' entrepreneurs. Nevertheless, the mean and median incomes of entrepreneurs appear to be lower or similar – but not higher – than the mean incomes of employees (conditional on various individual characteristics). This would lead to lower levels of utility. Entrepreneurs' incomes are also more variable over time than employee incomes, which reduce the utility of risk averse individuals, too. However, there must be various less tangible benefits to entrepreneurship like greater autonomy, or else, entrepreneurs are very irrational, optimistic, or risk seeking (or underreport their incomes):

Entrepreneurs have higher levels of job satisfaction than employees. All in all, we conclude that entrepreneurs have a very important – but specific – function in the economy. They engender relatively high levels of employment creation, productivity growth and produce and commercialize high quality innovations. They are more satisfied than employees. However, the counterparts cannot be missed as they account for scale in terms of labor demand and GDP, a less volatile and more secure labor market, higher paid jobs and a greater number of innovations and the adoption of innovations.

We refrain from discussing the implications these conclusions have for policymakers. While most of the studies reviewed in the paper give certain proposals based on their respective findings, we concede the limitations of our analysis. Our analysis allows conclusions about the relative contribution of entrepreneurs to the various economic areas, but we have not investigated the possible causes. This warrant an entire study in itself. Moreover, interrelationships may exist between the types of contributions we have considered and brim over effects to non-entrepreneurial firms, especially at the regional level (Scott, 2006). Some research into these interrelationships has been initiated recently and discussed here. It is clear from this handful of studies that circumlocutory spillover effects in all areas cannot be ignored and that they should be measured much more extensively. For example, it may well be that a more gainful entrepreneurial firm is better (or less) able at facilitating employment and producing innovations, whereas the innovativeness of entrepreneurs may be the result of non-entrepreneurial firms in the same area and/or sector that produce innovations. Such interrelationships and spillover effects should be measured and taken into account when scheming policy.

References

Acs, Z.J. and Audretsch, D.B. (2005). "Entrepreneurship, Innovation and Technological Change",Foundations and Trends in Entrepreneurship, 1 (4)

Acs, Z.J. and Gifford, S. (1996). "Innovation of Entrepreneurial Firms", Small Business Economics, 8 (3), 203-218

Acs, Z.J. and Mueller, P. (2007). "Employment Effects of Business Dynamics: Mice, Gazelles and Elephants", Small Business Economics, forthcoming

Acs, Z.J. and Varga, A. (2005). "Entrepreneurship, Agglomeration and Technological Change", Small Business Economics, 24 (3), 323-334

Almeida, P. and Kogut, B. (1997). "The Exploration of Technological Diversity and the Geographic Localization of Innovation", Small Business Economics, 9 (1), 21-31

Anyadike-Danes, M., Hart, M., and O'Reilly, M. (2005). "Watch that Space! The County Hierarchy in Firm Births and Deaths in the UK, 1980-1999", Small Business Economics, 25 (3), 273-292

Arvanitis, S. (1997). "The Impact of Firm Size on Innovative Activity - an Empirical Analysis Based on Swiss Firm Data", Small Business Economics, 9 (6), 473-490

Astebro, T. and Bernhardt, I. (2005). "The Winner's Curse of Human Capital", Small Business Economics, 24 (1), 63-78

Audretsch, D.B. and Vivarelli, M. (1996). "Firm Size and R&D Spillovers: Evidence from Italy", Small Business Economics, 8 (3), 249-258

Audretsch, D.B., Carree, M.A., Van Stel, A.J. and Thurik, A.R. (2002). "Impeded Industrial Restructuring: The Growth Penalty", Kyklos 55, 81-98.

Baldwin, J.R. (1998). "Were Small Producers the Engines of Growth in the Canadian Manufacturing Sector in the 1980s?", Small Business Economics, 10 (4), 349-364

Baldwin, J. and Picot, G. (1995). "Employment Generation by Small Producers in the Canadian Manufacturing Sector", Small Business Economics, 7 (4), 317-331

Baptista, R., Escaria, V. and Madruga, P. (2007). "Entrepreneurship, Regional Development and Job Creation: The Case of Portugal", Small Business Economics, forthcoming

BarNir, A., Gallaugher, J.M. and Auger, P. (2003). "Business process digitization, strategy, and the impact of firm age and size: the case of the magazine publishing industry", Journal of Business Venturing, 18 (6), 789-814

Benz, M. and Frey, B.S. (2003). "The Value of Autonomy: Evidence from the Self-Employed in 23 Countries", University of Zurich Working Paper #173, Zurich, Switzerland

Biggs, T. (2002). "Is Small Beautiful and Worthy of Subsidy?", International Finance Corporation, Washington, U.S.A. Link: rru.worldbank.org/PapersLinks/Open.aspx?id=2482

Blanchflower, D.G. and Oswald, A.J. (1998). "What Makes an Entrepreneur?", Journal of Labor Economics, 16 (1), 26-60

Broersma, L. and Gautier, P. (1997). "Job Creation and Job Destruction by Small Firms: An Empirical Investigation for the Dutch Manufacturing Sector", Small Business Economics, 9 (3), 211-224

Brouwer, E. and Kleinknecht, A. (1996). "Firm Size, Small Business Presence and Sales of Innovative Products: A Micro-econometric Analysis", Small Business Economics, 8 (3), 189-201

Brouwer, P., De Kok, J. and Fris, P. (2005). "Can firm age account for productivity differences?", EIM SCALESpaper N200421, Zoetermeer, Netherlands
Brown, C. and Medoff, J.L. (2003). " Firm Age and Wages", Journal of Labor Economics, 21 (3), 677-697
Burgess, S., Lane, J. and Stevens, D. (2000). "Job Flows, Worker Flows, and Churning", Journal of Labor Economics, 18 (3), 473-502
Callejon, M. and Segarra, A. (1999). "Business Dynamics and Efficiency in Industries and Regions: The Case of Spain", Small Business Economics, 13 (4), 253-271
Calvo, J.L. (2006). "Testing Gibrat's Law for Small, Young, and Innovating Firms", Small Business Economics, 26 (2), 117-123
Carree, M.A. (2002). "Industrial Restructuring and Economic Growth", Small Business Economics 18, 243-255
Carree, M.A. and Thurik, A.R.. (2003). "The Impact of Entrepreneurship on Economic Growth", in: Z.J. Acs and D.B. Audretsch (eds.), Handbook of Entrepreneurship Research, Boston, MA: Kluwer Academic Publishers, 437-471
Carree, M.A. and Thurik, A.R. (2007). "The Lag Structure of the Impact of Business Ownership on Economic Performance in OECD Countries", Small Business Economics, forthcoming
Carrington, W.J., McCue, K. and Pierce, B. (1996). "The Role of Employer/Employee Interactions in Labor Market Cycles: Evidence from the Self-Employed", Journal of Labor Economics, 14 (4), 571-602
Castany, L., López-Bazo, E. and Moreno, R. (2005). "Differences in Total Factor Productivity Across Firm Size.
A Distributional Analysis.", University of Barcelona Working Paper
Caves, R.E. (1998). "Industrial Organization and New Findings on the Turnover and Mobility of Firms", Journal of Economic Literature, 36 (4), 1947-1982
Chandrashekaran, M. and Sinha, R.K. (1995). "Isolating the Determinants of Innovativeness: A Split- Population Tobit (SPOT) Duration Model of Timing and Volume of First and Repeat Purchase", Journal of
Marketing Research, 32 (August), 444-456
Clark, A.E. and Oswald, A.J. (1996). "Satisfaction and comparison income", Journal of Public Economics, 61(3), 359-381
Cowling, M. (2001). "Fixed Wages or Productivity Pay: Evidence from 15 EU Countries", Small Business Economics, 16 (3), 191-204
Cramer, J.S., Hartog, J., Jonker N., Van Praag, C.M., (2002). "Low Risk Aversion Encourages the Choice for Entrepreneurship: An Empirical Test of a Truism", Journal of Economic Behavior and Organization, 48 (1), 29-36
Czarnitzki, D. and Kraft, K. (2004). "Firm Leadership and Innovative Performance: Evidence from Seven EU Countries", Small Business Economics, 22 (5), 325-332
Davis, S.J. and Haltiwanger, J. (1992). "Gross Job Creation, Gross Job Destruction, and Employment Reallocation", The Quarterly Journal of Economics, 107 (3), 819-863
Davis, S.J., Haltiwanger, J. and Schuh, S. (1996). "Small Business and Job Creation: Dissecting the Myth and Reassessing the Facts", Small Business Economics, 8 (4), 297-315
Dechenaux, E., Goldfarb, B., Shane, S.A. and Thursby, M.C. (2003). "Appropriability and the Timing of Innovation: Evidence from MIT Inventions", NBER Working Paper 9735, Cambridge, MA, U.S.A.
Disney, R., Haskal, J. and Heden, Y. (2003). "Restructuring and Productivity Growth in UK Manufacturing", The Economic Journal, 113 (July), 666-694
Dunne, T., Roberts, M.J. and Samuelson, L. (1988). "Patterns of Firm Entry and Exit in U.S. Manufacturing Industries", The RAND Journal of Economics, 19 (4), 495-515
Ekelund, J., Johansson, E., Järvelin, M.R. and Lichtermann, D. (2005). "Self-Employment and Risk Aversion - Evidence from Psychological Test Data", Labour Economics, 12 (5), 649-659
Fairlie, R.W. (2005). "Entrepreneurship and Earnings among Young Adults from Disadvantaged Families", Small Business Economics, 25 (3), 223-236
Feldman, N.E. and Slemrod, J. (2007). "Estimating tax non-compliance with evidence from unaudited tax returns", Economic Journal , 117 (518), 327-352
Fölster, S. (2000). "Do Entrepreneurs Create Jobs?", Small Business Economics 14(2), 137-148
Foster, L. Haltiwanger, J. and Krizan, C.J. (2006). "Market Selection, Reallocation, and Restructuring in the U.S. Retail Trade Sector in the 1990s", The Review of Economics and Statistics, 88 (4), 748-758
Frey, B.S. and Benz, M. (2003). "Being Independent is a Great Thing: Subjective Evaluations of Self-Employment and Hierarchy", CESifo Working Paper #959, Munich, Germany
Fritsch, M. (1997). "New Firms and Regional Employment Change", Small Business Economics, 9, 437-448
Fritsch, M. (2007). "How does New Business Formation Affect Regional Development?", Small Business Economics, forthcoming
Fritsch, M. and Mueller, P. (2007). "The Effect of New Business Formation on Regional Development over Time. The Case of Germany", Small Business Economics, forthcoming

Gibrat, R. (1931). "Les Inegalites Economiques", Paris, France: Librairie du Recueil Sirey
Hamilton, B.H. (2000). "Does Entrepreneurship Pay? An Empirical Analysis of the Returns to Self-Employment", The Journal of Political Economy, 108 (3), 604-631
Hart, P.E. and Oulton, N. (1996). "Growth and Size of Firms", The Economic Journal, 106 (438), 1242-1252
Hartarska, V. and Gonzalez-Vega, C. (2006). "What Affects New and Established Firms' Expansion?
Evidence from Small Firms in Russia", Small Business Economics, 27 (2), 195-206
Hartog, J., Van der Sluis, J. and Van Praag, M. (2007). "Returns to Intelligence: Entrepreneurs versus Employees",
University of Amsterdam Working Paper, Amsterdam, Netherlands
Heshmati, A. (2001). "On the Growth of Micro and Small Firms: Evidence from Sweden", Small Business Economics, 17 (3), 213-228
Hewitt-Dundas, N. (2006). "Resource and Capability Constraints to Innovation in Small and Large Plants", Small Business Economics, 26 (3), 257-277
Holtz-Eakin, D., Rosen, H.S. and Weathers, R. (2000). "Horatio Alger Meets the Mobility Tables", Small Business Economics, 14 (4), 243-274
Huergo, E. and Jaumandreu, J. (2004). "How Does Probability of Innovation Change with Firm Age?", Small Business Economics, 22 (3-4), 193-207
Jensen, J.B., McGuckin, R.H., and Stiroh, K.J. (2001). "The Impact of Vintage and Survival on
Productivity: Evidence from Cohorts of U.S. Manufacturing Plants", The Review of Economics and Statistics, 83 (2), 323-332
Johansson, D. (2005). "The Turnover of Firms and Industry Growth", Small Business Economics, 24 (5), 487-495
Kawaguchi, D. (2002). "Compensating Wage Differentials among Self-Employed Workers: Evidence from Job
Satisfaction Scores", Osaka University Working Paper, Osaka, Japan
Koga, T. (2005). "R&D Subsidy and Self-Financed R&D: The Case of Japanese High-Technology Start-Ups", Small Business Economics, 24 (1), 53-62
Konings, J. (1995). "Gross Job Flows and The Evolution of Size in U.K. Establishments", Small Business Economics, 7 (3), 213-220
Kortum, S. and Lerner, J. (2000). "Assessing the Contribution of Venture Capital to Innovation", The RAND Journal of Economics, 31 (4), 674-692
Lever, M.H.C. (1996). "Firm Size and Employment Determination in Dutch Manufacturing Industries", Small Business Economics, 8 (5), 389-396
Love, J.H. and Ashcroft, B. (1999). "Market Versus Corporate Structure in Plant-Level Innovation Performance", Small Business Economics, 13 (2), 97-109
Lowe, R.A. and Ziedonis, A.A. (2006). "Over-optimism and the Performance of Entrepreneurial Firms", Management Science, 52 (2), 173-186
Lucchetti, R. and Sterlacchini, A. (2004). "The Adoption of ICT among SMEs: Evidence from an Italian Survey", Small Business Economics, 23 (2), 151-168
Luger, M.I. and Koo, J. (2005). "Defining and Tracking Business Start-Ups", Small Business Economics, 24(1), 17-28
Maes, J., Sels, L., Roodhooft, F. (2005). "Modeling the Link Between Management Practices and Financial Performance", Small Business Economics, 25 (1), 17-34
Mueller, P., Van Stel, A. and Storey, D. (2007) "The Effects of New Firm Formation on Regional Development over Time: The Case of Great Britain", Small Business Economics, forthcoming
Neumark, D., Zhang, J. and Wall, B. (2005). "Business Establishment Dynamics and Employment Growth", available at SSRN: http://ssrn.com/abstract=909249
Nguyen, S.V. and Lee, S.H. (2002). "Returns to Scale in Small and Large U.S. Manufacturing Establishments: Further Evidence", Small Business Economics, 19 (1), 41-50
Norton, W.I., Moore, W.T. (2006). "The Influence of Entrepreneurial Risk Assessment on Venture Launch or Growth Decisions", Small Business Economics, 26 (3), 215-226
Nurmi, S. (2006). "Sectoral Differences in Plant Start-up Size in the Finnish Economy", Small Business Economics, 26 (1), 39-59
Oliveira, B. and Fortunato, A. (2006). "Firm Growth and Liquidity Constraints: A Dynamic Analysis", Small Business Economics, 27 (2-3), 139-156
Oosterbeek, H. and Van Praag, M. (1995). "Firm-Size Wage Differentials in the Netherlands", Small Business Economics, 7 (3), 173-182
Pannenberg, M. and Wagner, G.G. (2001). "Overtime Work, Overtime Compensation and the Distribution of Economic Well-Being. Evidence for the West Germany and Great Britain", IZA Discussion Paper #318, Bonn, Germany

Parker, S.C. (2004). "The Economics of Self-Employment and Entrepreneurship", Cambridge, U.K., Cambridge University Press

Picot, G. and Dupuy, R. (1998). "Job Creation by Company Size Class: The Magnitude, Concentration and Persistence of Job Gains and Losses in Canada", Small Business Economics, 10 (2), 117-139

Robbins, D.K., Pantuosco, L.J., Parker, D.F. and Fuller, B.K. (2000). "An Empirical Assessment of the Contribution of Small Business Employment to U.S. State Economic Performance", Small Business Economics, 15 (4), 293-302

Rodríguez, A.C., Molina, M.A., Pérez, A.L.G. and Hernández, U.M. (2003). "Size, Age and Activity Sector on the Growth of the Small and Medium Firm Size", Small Business Economics, 21 (3), 289-307

Roper, S. (1999). "Under-Reporting of R&D in Small Firms: The Impact on International R&D Comparisons", Small Business Economics, 12 (2), 131-135

Rosen, S. (1981). "The Economics of Superstars", The American Economic Review, 71 (5), 845-858 Rosen, H. and Willen, P. (2002). "Risk, Return and Self-Employment", University of Chicago/Princeton University Discussion Paper, U.S.A.

Scott, A.J. (2006). "Entrepreneurship, Innovation and Industrial Development: Geography and the Creative Field Revisited", Small Business Economics, 26 (1), 1-24

Shaffer, S. (2006). "Establishment Size and Local Employment Growth", Small Business Economics, 26 (5), 439-454

Solow, R.M. (1957). "Technical Change and the Aggregate Production Function", The Review of Economics and Statistics, 39 (3), 312-320

Sørensen, J.B. and Stuart, T.E. (2000). "Aging, Obsolescence, and Organizational Innovation", Administrative Science Quarterly, 45 (1), 81-112

Spletzer, J.R. (2000). "The Contribution of Establishment Births and Deaths to Employment Growth", Journal of Business and Economic Statistics, 18 (1), 113-126

Sternberg, R. and Wennekers, S. (2005). "Determinants and Effects of New Business Creation Using Global Entrepreneurship Monitor Data", Small Business Economics 24 (3), 193-203

Sutton, J. (1997). "Gibrat's Legacy", Journal of Economic Literature, 35 (1), 40-59

Troske, K.R. (1999). "Evidence on the Employer Size-Wage Premium from Worker-Establishment Matched Data", The Review of Economics and Statistics, 81 (1), 15-26

Van der Sluis, J. and Van Praag, C.M. (2007). "Returns to Education for Entrepreneurs and Employees: Identification by Means of Changes in Compulsory Schooling Laws", University of Amsterdam Working Paper, Amsterdam, Netherlands

Van der Sluis, J., Van Praag, M. and Van Witteloostuijn, A. (2006). "Why are the returns to education higher for entrepreneurs than for employees?", University of Amsterdam Working Paper, Amsterdam, Netherlands

Van Praag, C.M. and Cramer, J.S. (2001). "The Roots of Entrepreneurship and Labor Demand: Individual Ability and Low Risk Aversion", Economica, 68 (269), 45-62

Van Stel, A. and Suddle, K. (2007). "The Impact of New Firm Formation on Regional Development in the Netherlands", Small Business Economics, forthcoming

Van Stel, A., M. Carree and R. Thurik. (2005). "The Effect of Entrepreneurial Activity on National Economic Growth", Small Business Economics 24 (3), 311-321

Wennekers, S., Van Stel, A, Thrurik, R., Reynolds, P. (2005). "Nascent Entrepreneurship and the Level of Economic Development", Small Business Economics, 24 (3), 293-309

Winter-Ebmer, R. and Zweimuller, J. (1999). "Firm-Size Wage Differentials in Switzerland: Evidence from Job-Changers", The American Economic Review, 89 (2) Papers and Proceedings, 89-93

Wong, P.K., Ho, Y.P. and Autio, E. (2005). "Entrepreneurship, Innovation, and Economic Growth: Evidence from GEM Data", Small Business Economics, 24(3), 335-350

Wunnava, P.V. and Ewing, B.T. (2000). "Union-Nonunion Gender Wage and Benefit Differentials across Establishment Sizes", Small Business Economics, 15 (1), 47-57

Wynarczyk, P. and Watson, R.. (2005). "Firm Growth and Supply Chain Partnerships: An Empirical Analysis of U.K. SME Subcontractors", Small Business Economics 24 (1), 39-51

Yang, C-H. and Huang, C-H. (2005). "R&D, Size and Firm Growth in Taiwan's Electronics Industry",Business Economics 25 (5), 477-487

The IISTE is a pioneer in the Open-Access hosting service and academic event management. The aim of the firm is Accelerating Global Knowledge Sharing.

More information about the firm can be found on the homepage:
http://www.iiste.org

CALL FOR JOURNAL PAPERS

There are more than 30 peer-reviewed academic journals hosted under the hosting platform.

Prospective authors of journals can find the submission instruction on the following page: http://www.iiste.org/journals/ All the journals articles are available online to the readers all over the world without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. Paper version of the journals is also available upon request of readers and authors.

MORE RESOURCES

Book publication information: http://www.iiste.org/book/

Recent conferences: http://www.iiste.org/conference/

IISTE Knowledge Sharing Partners

EBSCO, Index Copernicus, Ulrich's Periodicals Directory, JournalTOCS, PKP Open Archives Harvester, Bielefeld Academic Search Engine, Elektronische Zeitschriftenbibliothek EZB, Open J-Gate, OCLC WorldCat, Universe Digtial Library , NewJour, Google Scholar