Estimating Entrepreneurial Jobs
— Business Creation is Job Creation

Ying Lowrey*

Abstract

This paper distinguishes two kinds of jobs in the process of business creation. One is the "employment job" offered by an employer to an employee through a contractual (paid) relationship. The other is the "entrepreneurial job" created by active business owners for themselves. Only a small proportion of salaried entrepreneurial jobs are included in official employment statistics. To estimate the scale of entrepreneurial jobs, this paper examines mainly three databases—the Panel Study of Entrepreneurial Dynamics (PSED), the Kauffman Firm Survey (KFS), and the 2002 Survey of Business Owners (SBO)—of all three they provide information in detail of both employment and business owners. In 2002, an average of 5.8 jobs (4.4 employment jobs and 1.4 entrepreneurial jobs) created by a startup employer firm and an average of 1.2 entrepreneurial jobs by a startup nonemployer firm. At the same time, each of the entrepreneurial job takers contributed an average of 33.1 labor hours per week to their startup firms. It estimates that at least 2.5 million people created their own entrepreneurial jobs every year between 1997 and 2008, in addition to creating more than one million paid employment jobs. The paper concludes that business creation is job creation; and recommends that job statistics should include entrepreneurial jobs. To encourage job creation, policymakers need to recognize that startup business owners are creators of jobs for others, but most importantly, for themselves.

* The author expresses her appreciation to Ernst Nilsson, James VanWert, Radwan Saade, Claudia Rodgers, Kathy Tobias, Janis Reyes, and Major Clark for their useful comments and insights. I am especially indebted to Paul Reynolds for contributing his great knowledge of databases and nascent entrepreneurs and his comments on earlier versions of the paper.

I. Introduction

Job creation is important to the wellbeing of an economy and has become an urgent national priority following the recent financial crisis. Not all jobs are counted. The official number of jobs includes payroll jobs and multiple jobholders but excludes self-employed entrepreneurs and unpaid workers in business startups [Bowler & Morisi, (2006) p. 29]. This exclusion of unpaid entrepreneurial activities complicates policy development for expanding productive economic activity in general; and for regaining growth momentum in recessions. Therefore, this paper attempts to estimate the number of entrepreneurial jobs. To achieve this goal, it first develops a definition of entrepreneurial jobs, as opposed to (paid) employment jobs. Second, it documents that business creation is job creation. Third, it estimates the magnitude of creation of both entrepreneurial and employment jobs resulting from business creations, using the Panel Study of Entrepreneurial Dynamics (PSED), the Kauffman Firm Survey (KFS), the Survey of Business Owners, and other selected government databases.

In addition to the serious recession resulted high unemployment, the nation was pressured and encouraged for productivity increase, more and more firms would hire fewer workers. Higher and higher cost of employing a worker strongly discourage job offering.[1] At the same time, due to the information technology revolution and job market innovations such as outsourcing and contracting, higher output can be achieved without increasing employment. For example, large and small firms are increasingly purchasing the services of outsiders to perform tasks previously performed by in-house employees. "The outside service providers are used to carry out administrative duties or to provide business support such as security, engineering, maintenance, sales, data processing, software development, legal services, accounting services, and food services."[2] The U.S. Census Bureau data have verified this trend in the labor market.[3] Expanding the "job market" from which it was traditional defined is timely endeavor for improving people's economic wellbeing.

The remainder of the paper is organized as follows. Section II defines entrepreneurial jobs by reviewing relevant literature. Section III highlights facts about nascent entrepreneurs in the business creation process from the Panel Study of Entrepreneurial Dynamics (PSED) II data; summarizes the findings concerning high-growth, high-tech startups from the Kauffman Firm Survey (KFS); and explores business/job creation as exhibited in the Survey of Business Owners (SBO). Section IV adjusts the existing job counts using data from Statistics of U.S. Business and

[1] According to Phillips and Wade (2008), "The 'Cost of Health Insurance' continues its reign as the number one small business problem, a position it has held for over 20 years. The number one ranking is nearly unanimous across all 53 sub-categories of businesses analyzed in this survey, e.g., S-corporations, manufacturers, 10-19 employees."
[2] Bartel, Lach, and Sicherman (2004) provided a more detailed explanation for declining employment.
[3] In 2002, more than 34 percent of employer firms (60.3 percent of those in the construction industry, 57.4 percent in utilities, and 50.4 percent in information) reported using contractors, subcontractors, independent contractors, and/or outside consultants to supplement their work forces. Eleven percent of construction employer firms used day laborers; 8.5 percent used temporary staffing, and 2.2 percent leased employees; leasing services or professional employer organizations are a major source of these latter human resources. Nearly 17 percent of manufacturing employer firms and nearly 12 percent of wholesale trade employer firms reported using temporary staffing from a temporary help service. http://www2.census.gov/econ/sbo/02/chartable_1.xls.

Nonemployer Statistics; and finally Section V concludes the paper, proposing that promotion of entrepreneurship is an effective strategy for job creation in the current economic recession.

II. Defining "Entrepreneurial Jobs"

The term *job* as used in this study refers to devoting one's labor time to achieving economic tasks. Two types of jobs are identified in this paper: employment jobs and entrepreneurial jobs. An employment job is a contractual arrangement between an employer and an employee that specifies work for pay. In contrast, an entrepreneurial job is a self-created position for exerting own efforts directly to the business creation.

Chart 1-A Simple Job Creation Process due to Business Creation

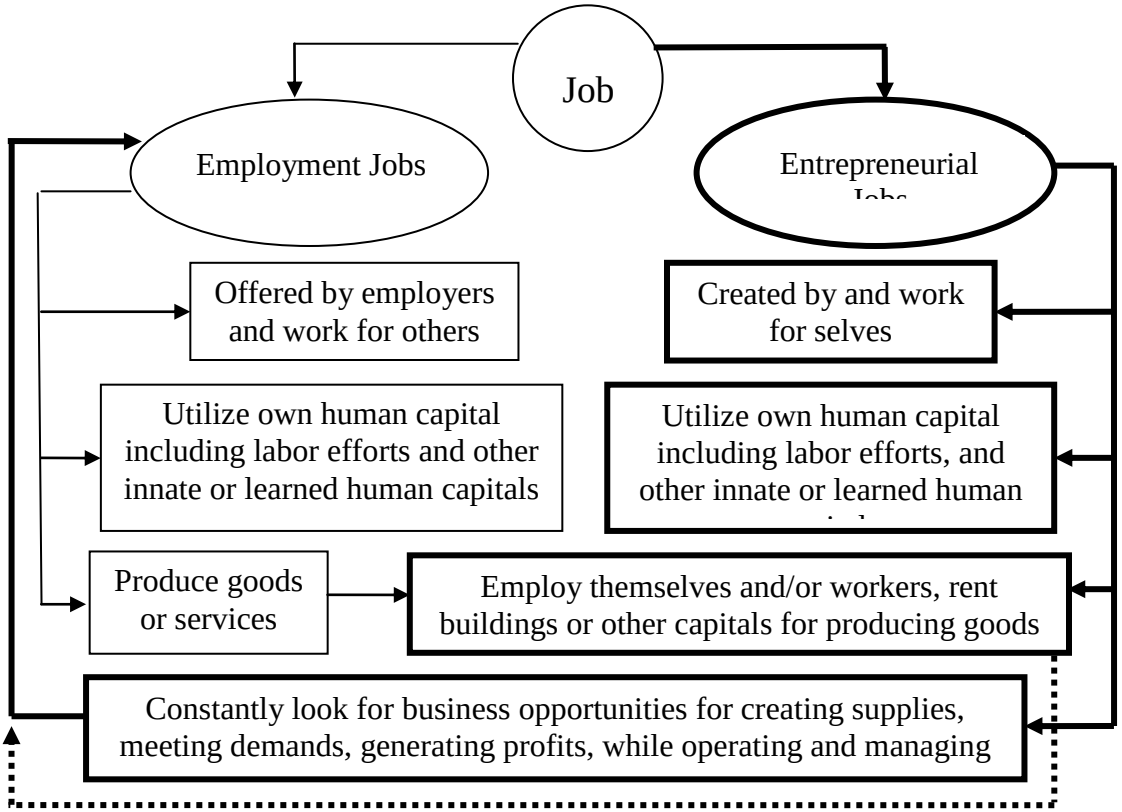


Chart 1 illustrates the process by which firm creation can lead to job creation. It summarizes of and distinguishes between employment jobs and entrepreneurial jobs. Entrepreneurs create their own jobs that include a wide spectrum of economic activities. The established firms that emerge from their efforts create products or services in specific markets. They assemble resources and combine them to produce products or provide services. Once production reaches an appropriate level, they will hire employees to scale up output. Depending on the legal form of their created new firms, these entrepreneurs may add themselves as employees on the payroll and be counted

in the national paid employment registries. But until this threshold is achieved, startup entrepreneurs may be unpaid or self-employed workers. As a result, they may not be included in the national job statistics. These unpaid and self-employed jobs make contributions to the economy, involving millions of individuals, but are not incorporated in the job counts that are the basis of much scholarly research.

Since David Birch's landmark research on the role of small business in job creation in 1979, more and more data-driven articles have found an association between business creation and job creation. Unlike the original research, which emphasized new and small firms, much research has used self-employment as an indicator of entrepreneurial activity. Blau (1987), Evans and Jovanovic (1989), Fairlie (1999), and Dunn and Holtz-Eakin (2000) use various self-employment databases and examine reasons for self-employed business creation.

A significant share of empirical research using self-employment data focuses on the demographics of self-employment in the labor market. For example, Glazer and Moynihan (1970), Light (1979), Sowell (1981), and Moore (1983) view self-employment as a route out of poverty and as an alternative to unemployment, or a response to discrimination in the labor market. Borjas (1986) finds that self-employment represents an important component of the immigrant experience in the U.S. labor market. "Assimilation has a sizable impact on self-employment probabilities. The longer the immigrant resides in the United States, the higher the probability of self-employment."

Thurik, Carree, van Stel, and Audretsch (2008) simply ask, "Does self-employment reduce unemployment?" Their research introduces a simple two-equation vector auto-regression model where changes in unemployment and self-employment are linked to subsequent changes in those variables for a panel of 23 OECD countries between 1974 and 2002. The empirical results confirm the existence of two distinct relationships between unemployment and self-employment: the "refugee" or "push" effect (a positive relationship between unemployment and self employment) and an "entrepreneurial" or "push" effect (a negative relationship between self-employment and unemployment). These are sometimes referred to as necessity versus opportunity entrepreneurship. The paper finds that the "entrepreneurial" (or pull or opportunity) effects are considerably stronger than the "refugee" (or push or necessity) effects.

Much theoretical research concentrates on personal dispositions affecting the pursuit of self-employment. For example, Knight (1921) points to the entrepreneurs' risk-bearing capacity; Lazear (2005) is interested in the nature of the "jack of all trades"; Blanchflower and Oswald (1998) address the nonpecuniary utility yield from being independent and one's own boss; and Lowrey (2006, 2010) discovers the positive utility entrepreneurs derive from doing something new or something already existed in a new way, and from getting things done.[4] Moreover, Yamada (1996) notices that most of the "urban informal sector" (an alternative name for self-employed businesses) in developing countries "responds to a demand for urban services and

[4] Joseph Schumpeter's description: "the defining characteristic is simply the doing of new things or the doing of things that are already being done in a new way (innovation)." In addition, "the entrepreneur 'gets things done.'" See Schumpeter (1947), "The Creative Response in Economic History," p. 223, in *Essays on Entrepreneurs, Innovations, Business Cycles, and the Evolution of Capitalism,* Transaction Publishers, 3rd printing, 1997.

small-scale manufacturing. It absorbs the supply of entrepreneurial talent, which in turn enhances the sector's capacity to provide competitive earnings."

These studies show that in the process of establishing new businesses, entrepreneurs are not only creating businesses and jobs, but are also supplying their own labor. These efforts transforming their own labor and other human capital in the creation of new businesses and jobs should be taken into account in assessing actual number of total labor inputs. Although many entrepreneurs who incorporate their businesses (C corporations, S corporations, and incorporated partnerships) that put themselves on the payroll and are counted in the national employment totals, unincorporated nonemployers and many startup business owners who contribute significant time in the business operation and management are not yet on a payroll and would not be counted as "workers" in administrative data systems, such as the County Business Patterns.[5] It would be timely to determine the total labor contributions from the efforts currently overlooked and to identify the fundamental source of job creations.

This study will mainly focus on firm level data that reveal individual business owners' characteristics such as total number of active business owners, time contributed to their business operation and management.[6] Most self-employment data are based on household surveys. For example, the Current Population Survey (CPS) is a monthly survey of households conducted by the Bureau of the Census for the Bureau of Labor Statistics. The CPS March Supplement has been very useful for self-employment research. It provides a set of comprehensive information including wage/salary based employment, self-employment, and the individual's gender, ethnicity, race, household income, and occupation.[7] Unfortunately, self-employment is not an ideal proxy to estimate U.S. business creation. The database does not provide details, such as the types of products or services offered or the number of workers hired, of the businesses created by self-employed persons.

In addition, business and job creation have been studied at the establishment level based on administrative records. Davis and Haltiwanger (1990) pioneered this kind of study, using data from the U.S. Census Bureau's County Business Patterns. Two other useful data sources are the Business Employment Dynamics (BED) quarterly database, created by the Bureau of Labor Statistics,[8] and the Business Dynamics Statistics (BDS) database, constructed by the Center for Economic Studies at the U.S. Census Bureau.[9] While the research based on establishment-level

[5] http://www.census.gov/econ/cbp/index.html.

[6] Passive entrepreneurs, such as financial investors who do not participate in the business operation and management of the firm they invest, are excluded in this study.

[7] http://www.census.gov/apsd/techdoc/cps/cpsmar08.pdf.

[8] The Business Employment Dynamics (BED) data are a product of a federal-state cooperative program known as the Quarterly Census of Employment and Wages (QCEW), or the ES-202 program. The BED data are compiled by the U.S. Bureau of Labor Statistics (BLS) from existing quarterly state unemployment insurance (UI) records. Most employers in the United States are required to file quarterly reports on the employment and wages of workers covered by UI laws, and to pay quarterly UI taxes. Quarterly UI reports are sent by state work force agencies (SWAs) to BLS and form the basis of the BLS establishment universe sampling frame. These reports also are used to produce the quarterly QCEW data on total employment and wages and the longitudinal BED data on gross job gains and losses. Other important BLS uses of the UI reports are in the Current Employment Statistics (CES) program.

[9] Business Dynamics Statistics (BDS) include measures of establishment openings and closings, firm startups, job creation and destruction by firm size, age, and industrial sector, and several other statistics on business

data represents a significant improvement in business and job creation research at the "establishment level," what has been lacking is research based on data at the "firm level."

A firm is defined as "a business organization or entity consisting of one or more domestic establishment locations under common ownership or control."[10] The firm as a unit of analysis is important in that it not only provides insights into where products are produced or where services are performed, but also into how the business "benefits from a certain degree of autonomy in decision-making, especially for the allocation of its current resources" such as owner's human capital including their labor effort. (Bartelsman, Scarpetta, and Schivardi, 2003).

III. Estimating Entrepreneurial Jobs

The number of entrepreneurial jobs will be estimated from three comprehensive databases: the Panel Study of Entrepreneurial Dynamics (PSED), the Kauffman Firm Survey (KFS) and the Survey of Business Owners (SBO). These three databases represent different firm populations involved in entrepreneurial job creation: nascent or pre-profit firms representing all U.S. sectors in the PSED, post-registration new firms identified in the Dun and Bradstreet Data base for the KFS, and newly established firms in all sectors of SBO.

III-A. Estimates from the Panel Study of Entrepreneurial Dynamics

The PSED research program is designed to enhance the scientific understanding of how people start businesses. The program provides data on the process of business formation based on nationally representative samples of nascent entrepreneurs—those active in business creation before the venture reports initial profits. PSED I began with screening in 1998-2000 to select a cohort of 830 nascent entrepreneurs and a comparison group of those not involved in business creation. Three follow-up interviews were completed with the nascent entrepreneurs. PSED II began with screening in 2005-2006 to identify 1,214 nascent entrepreneurs; four annual follow-ups have been completed. The database includes information on the nature of those active as nascent entrepreneurs, the activities undertaken during the startup process, and the characteristics of startup efforts that become new firms.[11]

Using the PSED II database, Table 1 reports estimated entrepreneurial jobs and employment created by nascent entrepreneurs for the entire U.S. population. It starts with an estimate of the

---

dynamics. The BDS has some elements that are similar to the BLS Business Employment Dynamics and the Census Bureau's Statistics of U.S. Business (SUSB) programs. However, BDS provides the first publicly available tabulations of job creation by firm size and age that take advantage of the unique aspects of the confidential Longitudinal Business Database (LBD). The LBD contains information from a variety of sources including the Business Register, Economic Censuses, and surveys. The longitudinal linkages in the LBD rely on only one source: the Business Register. Since 1972, the U.S. Census Bureau has maintained a general-purpose Business Register for use by the federal statistical system. The Business Register is a database of U.S. business establishments and companies. BDS is available at http://www.ces.census.gov/index.php/bds/bds_database_list.

[10] http://www.census.gov/econ/census07/www/definitions.html.

[11] This section is contributed by Paul Reynolds.

total number of nascent entrepreneurs, divided by the number of expected owners, to obtain the number of nascent enterprises. The average number of full-time owners is used to predict the total number of full-time owners. The total full-time job equivalents are computed counting part-time jobs as half (0.5) of a full-time job. For both, the averages are based on the first detailed interview, so the estimates refer to 2005-2006, when the initial screening and detailed survey were completed and include all that would be considered recent active nascent entrepreneurs. All estimates are millions—so about 7 million ventures seem to receive full-time attention from 3.1 million owners and provide about 2.4 million "employment" jobs (a total of 5.6 million) during the startup process itself.

Despite critiques on relatively small sample size of PSED, Reynolds (2004) believes that there is high agreement between the estimates based on the samples developed from the PSED I and the annual number of new employer firms for 1998-2000 identified by the SBA/U.S. Census registry of employer firms. Several adjustments were required to provide national counts of PSED new ventures that had reported FDIC payments and would be incorporated in the U.S. Census listings. The annual average of 581,000 new employer firms for the 1998-2000 periods in the SBA/U.S. Census database well within the 95% confidence interval associated with the PSED I estimate with a mean value of 565,000. This suggests that both the PSED I representative sample and the SBA/U.S. Census listings are drawn from the same population of business ventures.

Table 1-Estimated Entrepreneurial Jobs and Employment Created by Nascent Entrepreneurs (Number in thousands)

Category	Mean value	95% confidence interval
Total nascent entrepreneurs	12,146	11,508 to 12,785
Total nascent ventures	7,032	6,445 to 7,660
Full-time involved owners	3,128	2,867 to 3,407
Full-time employees	2,428	2,225 to 2,644
Total full-time workers	5,556	5,092 to 6,051
Source: The Panel Study of Entrepreneurial Dynamics database is in the public domain and available at http://www.psed.isr.umich.edu/psed/data.		

III-B. Estimates from the Kauffman Firm Survey

The Kauffman Firm Survey (KFS) data are sponsored by the Ewing Marion Kauffman Foundation. The KFS used a simple stratified sampling design of cases drawn from the Dun and Bradstreet Market Identifier (DMI) files. In addition to a sample representative of all sectors in the DMI files, there was an oversample of businesses in high-technology sectors. It also oversampled the medium technology businesses relative to the nontechnology ones. The final chosen universe of the KFS data includes 4,928 businesses started in 2004. The database includes 2,166 variables for each case. This panel database includes follow-up surveys carried out in 2005, 2006, 2007, and 2008 respectively.

Business startups invigorate the economy by creating new ventures that provide jobs and generate wealth. Table 2 shows the impact of the KFS sample base of 4,928 new ventures. Of these, 1,985, or 40 percent, were employer firms, and they provided more than 8,117 jobs. Of all KFS employer firms, 88 percent were new and independent startups, and they were responsible for 77 percent of total KFS sample employment in 2004. The average number of employees per employer startup in the sample was 4.1. Startups in the KFS sample that were acquired or were franchises provided an average of 7.9 jobs per firm; new independent startups created 3.6 jobs per firm.[12]

One important role of business startups is often overlooked: the employment of the entrepreneurs themselves. Startups not only provide paid jobs to members in the labor force, they also put entrepreneurs (or business operators and managers) themselves to work. In the KFS sample, 4,928 new startups utilized the efforts of 6,871 entrepreneurs. Using weighted data, this can be shown to represent 73,279 startups and 101,200 owners in 2004 (see Table 3).[13] This implies an average of 1.4 entrepreneurs to start a single business.[14]

Table 2-Estimated Total Employment Created by KFS Sample Employer Firms, 2004

Category	Total startups in the sample		New and independent startups in the sample[1]		Acquired startups in the sample[2]	
	Number of firms	Estimated number of employees	Number of firms	Estimated number of employees	Number of firms	Estimated number of employees
Number of total firms	4928		4570		353	
Number of employer firms	1985	8117+	1746	6230+	239	1887+
Number of nonemployer firms[3]	2943		2824		114	
Employees per employer firm[4]		4.1		3.6		7.9

Source: The Kauffman Firm Survey database is in the public domain and available at http://sites.kauffman.org/kfs/resources.cfm?user_id=4439&cat=data.

Notes:

1. Eighty-eight percent of all employer startups in the KFS sample were new, independent businesses created by a single person or a team of people.
2. The other 12 percent of all startups in the KFS sample were either acquired businesses or franchises, or businesses started some other way.
3. Includes firms that did not report employee information.
4. The total estimated employees divided by the total number of employer firms (excluding firms that did not report employee information).

Table 4 estimates entrepreneurs' average working hours in a week. Both the sample count and the weighted count of startup owners show that entrepreneurs who actively participated in business startup operations worked full time (about 40 hours per week on average). Considering that millions of firms start every year in the United States, this is a massive productive human capital injection to the economy, with concomitant vibrant economic activities including

[12] These include purchased existing businesses, purchased franchises, or businesses started some other way.
[13] About 70 percent of total startups had one business owner, 24 percent had two owners, and 6 percent had more than two owners.
[14] The KFS weighted average was 1.38, while the unweighted sample average was 1.39, a difference of 0.01.

inventions or innovations of new technologies; creation of new products, new services, or new markets; excavation of financial resources; employment of new workers; and management and maintenance of business operations.

Table 3-Estimated Business Owners in the KFS Sample of Firms, 2004

Number of firm owners	Sample firm count[1]	Share of sample (percent)	Total owners in KFS sample[2]	Weighted firm count[3]	Share of weighted sample (percent)	KFS estimated total number of owners[4]
Firm with one owner	3,445	69.9	3,445	51,448	70.2	51,448
Firm with two owners	1,168	23.7	2,336	17,672	24.1	35,343
Firm with three or more	315	6.4	1,090	4,159	5.7	14,409
Total	4,928	100.0	6,871	73,279	100.0	101,200
Average number of owners per firm[5]	--	--	1.39	--	--	1.38

Notes: The KFS oversampled startups with three or more owners and undersampled firms with one or two owners.
1. Total count of firms in KFS.
2. The number of owners that operated a startup business in 2004. All business owners here were operational owners; pure equity owners were excluded.
3. The estimated startup business count represented by the KFS sample using the weights created by the KFS.
4. The estimated number of business owners represented by the KFS sample using the weights created by the KFS.
5. The average number of owners per business estimated by the sample count and estimated count.

Table 4-Estimated Average Number of Hours Spent by the Owner in the Business Operation, 2004

Category	Total estimated owners[1]	Total estimated hours worked in a week[2]	Average hours worked per week
Sample count of startup owners	6,655	264,262	39.7
Weighted count of startup owners	98,103	3,909,755	39.9

Notes:
1. Total estimated number of owners in this table did not include owners who did not work for the firm. This estimated number also did not include items not reported in the survey.
2. The middle point calculation was used to estimate the total hours owners worked for the firm.

III-C. Estimates from the Survey of Business Owners

The U.S. Census Bureau's Survey of Business Owners provides the only comprehensive, regularly collected source of information on selected economic and demographic characteristics for businesses and business owners by gender, ethnicity, and race. Title 13 of the United States Code authorizes this survey and provides for mandatory responses. The data include all nonfarm businesses filing Internal Revenue Service tax forms as individual proprietorships, partnerships, or any type of corporation, and with receipts of $1,000 or more. All estimates are based on firms

that responded to the 2002 SBO, firms both with and without paid employees. The SBO is conducted on a company or firm basis rather than on an establishment basis. A company or firm is a business consisting of one or more domestic establishments that the reporting firm specified under its ownership or control.

Table A1 in the appendix estimates the number of respondent firms established in the year 2002 when the 2002 SBO data were collected. Using this result, Table 5 estimates the coefficients of new firms: 2002 startups as a percentage of total firms in 2002. Nearly 12 percent (11.9%) of all respondent nonemployer firms and slightly more than 4 percent (4.2%) of all respondent employer firms were the 2002 startup businesses (Table 5).[15]

Table 5-Estimated Coefficients of Startup Firms, Using the 2002 SBO Respondent Data

	2002 respondent startup firms	2002 total respondent firms	Coefficient of new firms in the total
Startup firms: Total	1,685,442	16,687,541	10.1%
Nonemployer firms	1,498,883	12,595,657	11.9%
Employer firms	171,859	4,091,884	4.2%

Source: See table A1 in the Appendix.

Table 6 estimates the coefficient of employment jobs—the average number of paid employees in respondent firms newly established in 2002. Notice that more than two-thirds, or 115,930, new firms reported no employees as of March 12, 2002, but actually had payroll at some time during the year. Even without the full count of newly created jobs in these startups, an average of 4.4 employment jobs per startup respondent employer firm existed as of March 12, 2002. This average is higher than the estimate, 4.1, from the KFS data.

Table 7 estimates the coefficient of entrepreneurial jobs—the average number of owners per firm. The 2002 SBO respondent data estimated that the number of owners per respondent employer firm is 1.36 and per respondent nonemployer firm is 1.19 (see Table A2 in the Appendix).[16] Based on these estimates, on average, an estimated total of 5.8 jobs (4.4 paid employment jobs and 1.36 entrepreneurial jobs) were created by a startup employer firm and 1.2 entrepreneurial jobs were created by a nonemployer firms in 2002. The total job creation by 2002 new startups was about 3.9 million (3,877,261), of which more than 1 million (27 percent) were employment jobs and more than 2.8 million (73 percent) were entrepreneurial jobs.

[15] A respondent firm is defined as a business that returned the survey form and provided the gender, Hispanic or Latino origin, or race characteristics for the owner(s) or indicated that the firm was publicly held. Detail may not add to the total because a Hispanic or Latino firm may be of any race. Moreover, each owner had the option of selecting more than one race and therefore is included in each race selected.

[16] Since the owner's number of respondent firm by year ownership established was not available during this research conducted, several measures were applied to estimate the coefficients of entrepreneurial jobs—the average number of owners per firm. The results were consistent: the coefficient of entrepreneurial jobs for total respondent firm was 1.23; for respondent employer firm was 1.36 and for respondent nonemployer firm was 1.19.

Table 6-Estimated Number of Paid Workers Employed by Respondent Firms Newly Started in 2002, by Employment Size of Firm

Firm employment size	Respondent employer firms started in 2002[1]	Estimated number of paid employees in new respondent employer firms[2]	Coefficient of employment jobs[3]
All firms	171,859	756,904+	4.4
No employees[4]	115,930	--	NA
1 to 4 employees	34,825	87,063	NA
5 to 9 employees	9,974	69,818	NA
10 to 19 employees	5,758	83,491	NA
20 to 99 employees	4,579	272,451	NA
100 to 499 employees	638	191,081	NA
500 employees or more	106	53,000+	NA

NA = Not available.

Notes:

1. Source: 2002 SBO, http://www2.census.gov/econ/sbo/02/charcbotable_a.xls.
2. Total employees were estimated by multiplying the total number of respondent employer firms by the middle point number of the firm employment size. For example, the middle point number for all firms with 1 to 4 employees is 2.5; for firms with 20 to 99 employees, it is 59.5.
3. The estimated coefficient of employment jobs = 756,904 ÷ 171,859 = 4.4.
4. Firms with no employees as of March 12, 2002, but with payroll at some time during the year.

Table 7-Estimated Number of Total Entrepreneurial Jobs, 2002

	Nonemployers (firms with no payroll)	Employers (firms with payroll)	Number of paid employees	Estimated job creation by the 2002 new startups
Statistics or estimates of the total	17,646,062[a]	5,697,759[b]	112,400,770[b]	3,877,261[c]
Estimated number of 2002 startup firms and their paid employment jobs[1]	2,099,881	239,306	1,052,946[d]	1,052,946[d]
Estimated number of entrepreneurial jobs[2]	2,498,859	325,456	--	2,824,315

Sources:

1. In row 2, the first cell (nonemployers) was obtained by multiplying the total above by 11.9 percent; the second cell was similarly obtained by multiplying the total above by 4.2 percent. These percentages were estimated in Table 5.
2. The estimated number of entrepreneurs in all newly started firms is the sum of two numbers: entrepreneurs in nonemployer firms were estimated by multiplying the estimated number of 2002 nonemployer firms by 1.19 and entrepreneurs in employer firms were estimated by multiplying the estimated number of employer firms by 1.36. See Table A2 for details.

a. Nonemployer Statistics, U.S. Census Bureau, http://www.census.gov/econ/nonemployer/index.html.
b. Statistics of U.S. Businesses, http://www.census.gov/econ/susb/.
c. The total number of jobs created in the 2002 startup firms (3,877,261) is the sum of estimated employment jobs (1,052,946) and entrepreneurial jobs (2,824,315).
d. The total number of paid employees of the 2002 startup firms was estimated by multiplying the total estimated number of 2002 startup firms by the coefficient of employment jobs. See Table 5.

Table 8- Estimated Average Number of Hours Spent Managing or Working in the Business by Owners, 2002

Category	Total estimated owners[1]	Total estimated hours worked in a week[2]	Average hours worked per week
Owners of respondent firms	18,804,314	622,872,368	33.1
Owners of employer respondent firms	5,022,215	210,567,928	41.9
Owners of nonemployer respondent firms	13,758,307	411,440,679	29.9

Notes:
1. Total estimated number of owners in this table did not include owners who did not work for the firm. This estimated number also did not include items not reported in the survey.
2. The middle point calculation was used to estimate total hours owners worked for the firm. Tables A3-A5 in the appendix provide detailed information about the numbers of estimated owners and total hours.

Table 9-Owner Responses to the Question Whether or Not the Business Provided the Owner's Primary Source of Personal Income, 2002

Business was primary source of income	Owners of respondent firms		Owners of employer respondent firms		Owners of nonemployer respondent firms	
	Number	Percent	Number	Percent	Number	Percent
All owners of respondent firms	20,528,726	--	5,574,045	--	14,954,681	--
Yes	10,449,122	50.9	3,873,961	69.5	6,565,105	43.9
No	9,627,972	46.9	1,577,455	28.3	8,045,618	53.8
Item not reported	451,632	2.2	117,055	2.1	329,003	2.2

Notes: Detail may not add to the total or subgroup total because a Hispanic or Latino firm may be of any race, and because a firm can be tabulated in more than one racial group. See Table A1 for detailed information about the table.

On average, active business owners spent more than 33.1 hours weekly managing or working in startup businesses (Table 8). About 70 percent of employer businesses and 44 percent of nonemployer businesses provided the entrepreneurs' primary source of personal income (see Table 9).

IV. Adjusting the Existing Job Counts

Table 10 summaries job creations from business creations. Three databases come together to a consistent fact: of the total jobs created, entrepreneurial jobs were a significant proportion. To estimate the entrepreneurial jobs in the U.S., it is applicable to utilize the parameters estimated by the SBO data that sampled on the base of the national business population. On average, 4.4 employment jobs and 1.23 entrepreneurial jobs per new business startup were created during the startup year.

Using the coefficients and other parameters calculated in Tables 5, 6, and A2, Table A6 shows the estimated number of jobs created by new startup firms in 1997 through 2008. More than 2.5

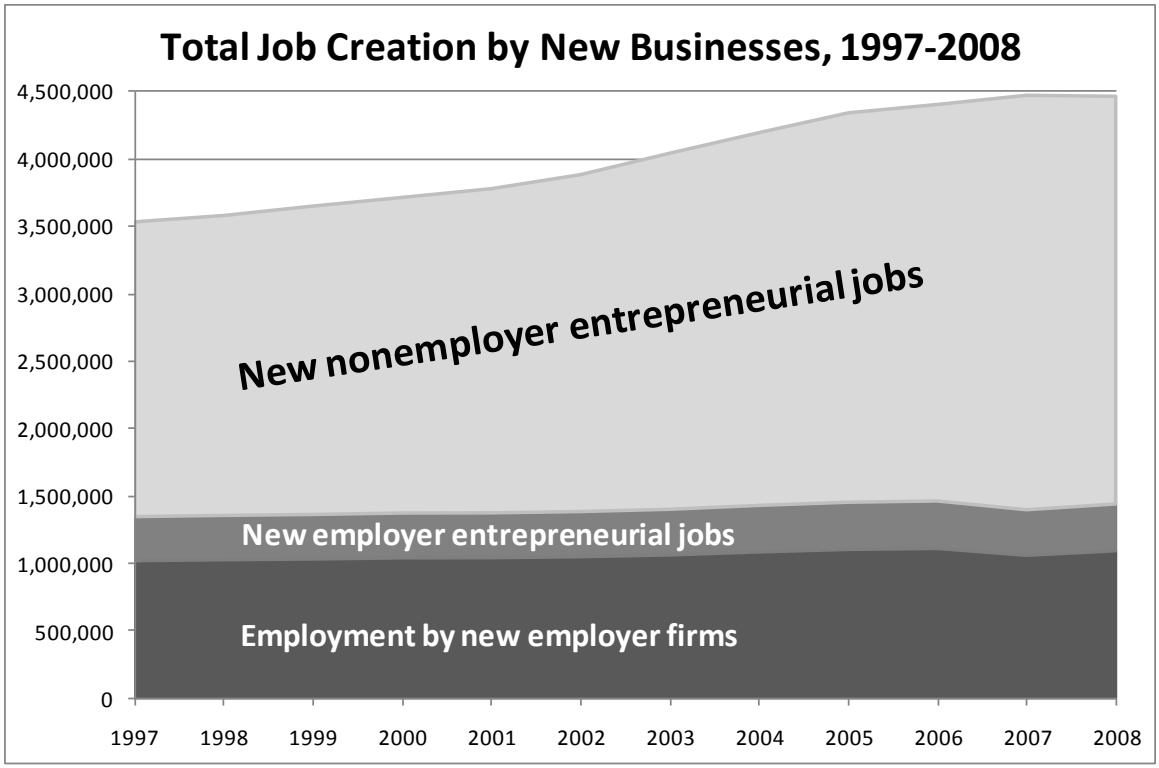
million entrepreneurs have contributed their labor effort and other human and financial capital to the economy, on top of creating one million paid employment jobs since 1997. Therefore, the total job creation from business creation should be counted at least 3.5 million a year rather than merely one million between 1997 and 2008. Chart 2 displays Table A6 and illustrates a large undercount of startup businesses' job creation because that only small proportion of employer firms offered employment were taken into account.

Table 10-Database Comparison: Employment Jobs and Entrepreneurial Jobs in the Business Creations

Database	Employment jobs			Entrepreneurial jobs		
	Number	Percent	Average[1]	Number	Percent	Average[2]
PSED-II (weighted)	2,428,000	44%	NA	3,128,000	56%	NA
KFS (sample)	8,117	54%	4.1	6,871	46%	1.39
SBO (respondent)	1,052,946	27%	4.4	2,824,315	73%	1.23

Sources: Table 1, 2, A2 and 6.
Notes:
1. Average number of employment jobs per startup employer firm.
2. Average number of entrepreneurial jobs per startup firm.

Chart 2-Total job creations by new startup firms



Data source: Data presented in this figure are estimated by the authors based on sources including: *Statistics of U.S. Businesses*, http://www.census.gov/econ/susb/, and *Nonemployer Statistics*, U.S. Census Bureau. http://www.census.gov/econ/nonemployer/index.html. The detail is in Table A6 in Appendix.

V. Conclusions

This paper estimates a relatively stable employment creation of more than one million by a relative stable number of more than 300,000 new employer entrepreneurs each year between 1997 and 2008. At the same time, more than 2 million and growing nonemployer entrepreneurs start new ventures and participate in business operational and managerial activities. I estimated at least a total of 3.5 million job creations due to business creations each year since 1997: more than one million are employment jobs; and more than 2.5 million are entrepreneurial jobs.

Business creation is job creation. Business creation generates not only employment jobs but also entrepreneurial jobs. In the face of high unemployment and one of the most severe financial crises since the Great Depression, rather than waiting for job offers, entrepreneurs continue to create businesses and employment for others but most importantly for themselves.

In his study of small business, the political scientist John Bunzel captured well the enduring symbolic importance of entrepreneurial jobs to Americans. He said, the entrepreneur "appears to have few enemies and is, in fact, something of a national hero. In his own way he represents the independence, freedom, and perseverance that have long been identified with the American way of doing things. …The small businessman has managed to be a symbol of success even in times when he has not, in point of fact, been financially successful."[17]

The Small Business Act of 1953 stated very well the government's role in supporting small businesses: "It is the declared policy of the Congress that the Government should aid, counsel, assist, and protect, insofar as is possible, the interests of small-business concerns in order to preserve free competitive enterprise, to ensure that a fair proportion of the total purchases and contracts or subcontracts for property and services for the Government (including but not limited to subcontracts for maintenance, repair and construction) be placed with small-business enterprises, to ensure that a fair proportion of the total sales of Government property be made to such enterprises, and to maintain and strengthen the overall economy of the Nation."[18]

The current joblessness reflects technological progress resulted structural change in international and domestic markets. The comparative advantage of the United States has shifted from manufacturing and other traditional industry sectors that required large numbers of workers toward new growth sectors such as information and communications, green technologies, health care, biotech and nanotech—sectors in which the potential for both employment and entrepreneurial jobs abounds. To encourage job creation in these frontier sectors, policymakers need to recognize the effectiveness and importance of business creation for job creation.

[17] Quoted in Blackford (1991), p. xiv.
[18] § 2. (a) in the *Small Business Act*, Public Law 65-536.

References:

Bartel, Ann, Saul Lach, and Nachum Sicherman (2004), "Outsourcing and Technological Change," *National Bureau of Economic Research Working Paper*.

Bartelsman, E., S. Scarpetta and F. Schivardi (2003), "Comparative Analysis of Firm Demographics and Survival: Micro-level Evidence for the OECD Countries," *OECD Economics Department Working Papers*, No. 328.

Blackford, Mansel (1991), *A History of Small Business in America*, New York: Twayne Publishers.

Blanchflower, David G. and Andrew J. Oswald (1998), "What Makes an Entrepreneur?" *Journal of Labor Economics* 16, no. 1: 26-60. (b).

Blau, David M. (1987), "A Time-Series Analysis of Self-Employment in the United States." *Journal of Political Economy* 95: 445-67.

Birch, David (1979), *The Job Creation Process*, Cambridge, MA: Center for the Study of Neighborhood and Regional Change, Cambridge, MA: MIT Press.

Bowler, Mary and Teresa Morisi (2006), "Understanding the employment measures from the CPS and CES survey," *Monthly Labor Review*, February, 23-38.

Bunzel, John (1956), *The American Small Businessman*, Salt Lake City: University of Utah Press.

Davis, S. J. and J.C. Haltiwanger (1990), "Gross Job Creation and Destruction: Microeconomic Evidence and Macroeconomic Implications," *NBER Macroeconomic Annual*, 123-168.

Dunne, T., M. J. Roberts, and L. Samuelson (1988), "Patterns of Firm Entry and Exit in U.S. Manufacturing Industries," *Rand Journal of Economics*, 19, 495-515.

Dunn, Thomas A., and Holtz-Eakin, Douglas J. (2000), "Financial Capital, Human Capital, and the Transition to Self-Employment: Evidence from Intergenerational Links," *Journal of Labor Economics* 18, no. 2: 282-305.

Evans, David, and Jovanovic, Boyan (1989), "An Estimated Model of Entrepreneurial Choice under Liquidity Constraints," *Journal of Political Economy* 97, No. 4: 808-27.

Evans, David, and Leighton, Linda (1989), "Some Empirical Aspects of Entrepreneurship," *American Economic Review* 79: 519-35.

Fairlie, Robert W. (1999), "The Absence of the African-American Owned Business: An Analysis of the Dynamics of Self-Employment," *Journal of Labor Economics* 17, no. 1: 80-108.

Gartner, W.B., K.G. Shaver, N. M. Carter, and P. D. Reynolds (Eds) (2004), *Handbook of Entrepreneurial Dynamics: The Process of Business Creation*. Thousand Oaks, CA: Sage Publications.

Greene, Richard (1982), "Job Growth in Private Industry," *MONTHLY LABOR REVIEW*, September 1982, 3-9.

Holtz-Eakin, Douglas, David Joulfaian, and Harvey Rosen (1994), "Entrepreneurial Decisions and Liquidity Constraints," *Rand Journal of Economics* 23, No. 2: 334-47.

Knight, Frank H. (1921), *Risk, Uncertainty and Profit*, New York: Houghton Mifflin.

Lazear, Edward (2005), "Entrepreneurship," *Journal of Labor Economics* 23(4), 649-680.

Light, Ivan (1979), "Disadvantaged Minorities in Self Employment," *International Journal of Comparative Sociology* 20, nos. 1-2:31-45.

Lowrey, Y. (2010), "Preference for Exerting Entrepreneurial Effort: a Neoclassical Model and Computational Simulation," paper presented to the Society for the Advancement of

Behavioral Economics (SABE) 2010 conference and submitted to the Journal of Socio-Economics for publication.

_____ (2006), "An Examination of Entrepreneurial Effort," paper presented at the 2006 *American Economic Association Conference* in Boston, posted at the web-link: http://www.aeaweb.org/annual_mtg_papers/2006/0107_1430_0302.pdf.

Meyer, Bruce. (1990), "Why Are There So Few Black Entrepreneurs?" *Working Paper* No. 3537, Cambridge, MA: National Bureau of Economic Research.

Moore, Robert L. (1983), "Employer Discrimination: Evidence from Self-Employed Workers," *Review of Economics and Statistics* 65, August: 496-501.

Phillips, Bruce and Holly Wade (2008), *Small Business Problems and Priorities 2008*, the NFIB Research Foundation.

Reynolds, Paul D. and Richard T. Curtin (Eds) (2009), *New Firm Creation in the U.S.: Initial Explorations with the PSED II Data Set*. New York: Springer (in press).

Reynolds, Paul D. (2004), "Nature of Business Start-Ups," Chapter 23 in Gartner, William B. et al (Eds), *Handbook of Entrepreneurial Dynamics: The Process of Business Creation*, Thousand Oaks, CA: Sage, 244-258.

Yamada, Gustavo (1996), "Urban Informal Employment and Self-Employment in Developing Countries: Theory and Evidence," in *Economic Development and Cultural Change*, Vol. 44, No. 2, pp. 289-314, The University of Chicago Press.

John Haltiwanger, Ron Jarmin and Javier Miranda (2008), "Business Formation and Dynamics by Business Age: Results from the New Business Demography Statistics."

Sadeghi, Akbar, James R. Spletzer, and David M. Talan (2009), "Business employment dynamics: annual tabulations," *Monthly Labor Review Online*, Vol. 132, No. 5.

Schumpeter, Joseph (1947), "The Creative Response in Economic History," in *Essays on Entrepreneurs, Innovations, Business Cycles, and the Evolution of Capitalism*, Transaction Publishers, 3rd printing, 1997.

Spletzer, James R. (2000), "The Contribution of Establishment Births and Deaths to Employment Growth," *Journal of Business & Economic Statistics*, January, Vol. 18, No. 1, p. 113-126.

Stauss, James H. (1944), "The Entrepreneur: The Firm," *The Journal of Political Economy*, Vol. 52, Issue 2, June, P112-127.

Thurika, A. Roy, Martin A. Carree, André van Stel, and David B. Audretsch (2008), "Does self-employment reduce unemployment?" *Journal of Business Venturing*, 23(6).

Definitions

http://www.census.gov/manufacturing/asm/definitions/index.html

Appendix:

Table A1-Number of Respondent Firms by Year Established, Purchased, or Acquired by Owner in 2002

Year owner established	Number			Percent	
	Total respondent firms	Respondent employer firms	Respondent nonemployer firms	Respondent employer firms	Respondent nonemployer firms
Total	16,687,541	4,091,884	12,595,657	100.0	100.0
2002	1,685,442	171,859	1,498,883	4.2	11.9
2001	1,201,503	208,686	995,057	5.1	7.9
2000	1,068,003	216,870	856,505	5.3	6.8
1999	851,065	196,410	654,974	4.8	5.2
1998	700,877	171,859	529,018	4.2	4.2
1997	634,127	171,859	466,039	4.2	3.7
1990 to 1996	2,953,695	847,020	2,103,475	20.7	16.7
1980 to 1989	2,369,631	810,193	1,561,861	19.8	12.4
Before 1980	1,702,129	650,610	1,058,035	15.9	8.4
Item not reported	3,521,071	642,426	2,871,810	15.7	22.8

Source: The 2002 Survey of Business Owners (SBO): Company Statistics Series: Statistics for Respondent Firms by Year Owner Established in http://www2.census.gov/econ/sbo/02/sb0200cscb.pdf.
Full technical documentation is available on the Census Bureau Internet site at www.census.gov/csd/sbo.

Table A2-Estimated Average Number of Owners per Respondent Firm, 2002 by Gender, Hispanic or Latino Origin, and Race

Business ownership by gender, Hispanic or Latino origin, and race	Respondent firms			Employer respondent firms			Nonemployer respondent firms		
	Number of firms	Number of owners	Owners per firm	Number of firms	Number of owners	Owners per firm	Number of firms	Number of owners	Owners per firm
All	16,687,541	20,528,725	**1.23**	4,091,884	5,574,044	**1.36**	12,595,657	14,954,681	**1.19**
Female	4,659,815	7,283,412	**1.56**	657,531	1,503,278	**2.29**	4,002,284	5,780,134	**1.44**
Male	9,544,370	13,244,750	**1.39**	2,577,861	4,070,762	**1.58**	6,966,509	9,173,988	**1.32**
Hispanic	868,751	1,090,738	**1.26**	136,394	209,553	**1.54**	732,357	881,185	**1.20**
Non-Hispanic	15,340,683	19,437,850	**1.27**	3,617,197	5,364,479	**1.48**	11,723,486	14,073,371	**1.20**
White	14,769,662	18,820,349	**1.27**	3,458,780	5,164,102	**1.49**	11,310,881	13,656,247	**1.21**
Black or African American	609,025	716,396	**1.18**	60,254	85,591	**1.42**	548,771	630,804	**1.15**
American Indian and Alaska Native	128,111	173,667	**1.36**	17,280	28,574	**1.65**	110,831	145,093	**1.31**
Asian	721,916	951,942	**1.32**	209,850	319,202	**1.52**	512,066	632,741	**1.24**
Native Hawaiian and Other Pacific Islander	17,823	25,812	**1.45**	2,505	4,680	**1.87**	15,318	21,131	**1.38**

Data source: U.S. Census Bureau, 2002 Survey of Business Owners, http://www2.census.gov/econ/sbo/02/charcbotable_a.xls.
Note: The detail may not add to the total or subgroup total because a Hispanic or Latino firm may be of any race, and because a firm can be tabulated in more than one racial group.

Table A3-Owner's Average Number of Hours Spent Managing or Working in the Business, 2002

Owner's average number of hours spent managing or working in the business	Owners of respondent firms[1]		Owners of employer respondent firms		Owners of nonemployer respondent firms	
	Number	Percent	Number	Percent	Number	Percent
All owners of respondent firms	20,528,726	100.0	5,574,045	100.0	14,954,681	100.0
None	1,395,953	6.8	395,757	7.1	1,001,964	6.7
Less than 20 hours	6,179,147	30.1	730,200	13.1	5,443,504	36.4
20 to 39 hours	3,633,585	17.7	707,904	12.7	2,916,163	19.5
40 hours	2,217,102	10.8	769,218	13.8	1,450,604	9.7
41 to 59 hours	4,126,274	20.1	1,727,954	31.0	2,392,749	16.0
60 hours or more	2,648,206	12.9	1,086,939	19.5	1,555,287	10.4
item not reported	348,988	1.7	161,647	2.9	179,456	1.2

Source: The 2002 Survey of Business Owners, http://www2.census.gov/econ/sbo/02/cvbo4.xls, by U.S. Bureau of Census.

Table A4-Owner's Average Number of Hours Spent Managing or Working in the Startup Business, Sample Data, 2004

Range of hours owner worked in a week	Owner 1	Owner 2	Owner 3	Owner 4	Total owners	Total hours*
1-19	822	366	101	34	1,323	13,230
20-35	959	363	68	19	1,409	38,748
36-45	707	228	53	12	1,000	40,500
46-55	756	170	34	11	971	49,036
56-65	899	175	26	6	1,106	66,913
66+	689	130	21	6	846	55,836
Total	4,832	1,432	303	88	6,655	264,262

Note: KFS surveyed up to 10 owners but only the top four owners were chosen for this tabulation, as most firms in the sample have a maximum of two owners. The information was collected from answers to the following question: "During the time (name of business) was in business during 2004, how many hours in an average week did you (owner) spend working at (name of business?)"
* Total hours estimated by using middle point method.

Table A5-Owner's Average Number of Hours Spent Managing or Working in the Startup Business, Weighted Data, 2004

Range of hours owner worked in a week	Owner 1	Owner 2	Owner 3	Owner 4	Total owners	Total hours
1-19	11,999	5,465	1,398	407	19,269	192,690
20-35	14,254	5,309	938	266	20,767	571,093
33-45	10,573	3,422	704	159	14,858	601,749
46-55	11,067	2,527	396	112	14,102	712,151
56-65	13,310	2,503	271	96	16,180	978,890
66+	10,662	1,883	294	88	12,927	853,182
Total	71,865	21,109	4,001	1,128	98,103	3,909,755

Note: KFS surveyed up to 10 owners but only the top four owners were chosen for this tabulation, as most firms in the sample have a maximum of two owners. The information was collected from answers to the following question: "During the time (name of business) was in business during 2004, how many hours in an average week did you (owner) spend working at (name of business?)"
* Total hours estimated by using middle point method.

Table A6-Estimated Number of Job Creation via Business Creation, 1997-2008

Year	Employer firm*	Employ-ment**	Non-employer firms	New employer firms[1]	Employ-ment by new employer firms[2]	New non-employer firms[3]	New employer entre-preneurial jobs[4]	New non-employer entre-preneurial jobs[5]	Total job created by new firms[6]
1997	5,541,918	105,299,123	15,439,609	232,761	1,024,146	1,837,313	316,554	2,186,403	3,527,104
1998	5,579,177	108,117,731	15,708,727	234,325	1,031,032	1,869,339	318,683	2,224,513	3,574,227
1999	5,607,743	110,705,661	16,152,604	235,525	1,036,311	1,922,160	320,314	2,287,370	3,643,995
2000	5,652,544	114,064,976	16,529,955	237,407	1,044,590	1,967,065	322,873	2,340,807	3,708,270
2001	5,657,774	115,061,184	16,979,498	237,627	1,045,557	2,020,560	323,172	2,404,467	3,773,195
2002	5,697,759	112,400,654	17,646,062	239,306	1,052,946	2,099,881	325,456	2,498,859	3,877,261
2003	5,767,127	113,398,043	18,649,114	242,219	1,065,765	2,219,245	329,418	2,640,901	4,036,084
2004	5,885,784	115,074,924	19,523,741	247,203	1,087,693	2,323,325	336,196	2,764,757	4,188,646
2005	5,983,546	116,317,003	20,392,068	251,309	1,105,759	2,426,656	341,780	2,887,721	4,335,260
2006	6,022,127	119,917,165	20,768,555	252,929	1,112,889	2,471,458	343,984	2,941,035	4,397,908
2007	5,752,967	118,665,692	21,708,021	241,625	1,063,148	2,583,254	328,609	3,074,073	4,465,831
2008	5,930,922	120,903,551	21,351,320	249,099	1,096,034	2,540,807	338,774	3,023,560	4,458,369

Source: Statistics of U.S. Businesses, http://www.census.gov/econ/susb/.
* 2008 number is estimated by the authors.
** 2007 and 2008 numbers are from http://censtats.census.gov/cgi-bin/cbpnaic/cbpsel.pl.
The estimating method:
1. New employer firms = Employer firms multiplied by 4.2 percent.
2. Employment by new employer firms = New employer firms multiplied by 4.4.
3. New nonemployer firms = Nonemployer firms multiplied by 11.9 percent.
4. New employer entrepreneurial jobs = New employer firms multiplied by 1.36.
5. New nonemployer entrepreneurial jobs = New nonemployer firms multiplied by 1.19 percent.
6. Total job created by new firms is the sum of 2, 4, and 5 above.