

KAUFFMAN INDEX OF
entrepreneurial
activity

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EXECUTIVE summary

Although research on entrepreneurship is growing rapidly, there are very few large national data sets that provide information on recent entrepreneurial trends. Using matched data from the 1996–2004 Current Population Surveys (CPS), a new measure of entrepreneurship has been developed: the Kauffman Index of Entrepreneurial Activity. Separate estimates of the Kauffman Index are reported for several demographic groups. The key findings are:

- Over the period from 1996 to 2004, an average of 0.36 percent of the adult population created a new business each month, representing approximately 550,000 new businesses per month.
- The entrepreneurship rate was relatively constant in the late 1990s, but rose in the past few years. The average rate of entrepreneurship was 0.36 percent in 1996, 0.35 percent in 2001, and 0.40 percent in 2004.
- Entrepreneurial activity is substantially higher among men than among women. From 1996 to 2004, the average rate of entrepreneurship for men was 0.46 percent while the average rate for women was only 0.28 percent.
- The rate of entrepreneurship increased in the early 2000s for men, but not for women. The male entrepreneurship rate was 0.43 percent in 2001 and rose to 0.50 percent in 2002.
- Entrepreneurial activity is much lower for African Americans than other ethnic or racial groups; however, rates appear to be increasing. The average rate of entrepreneurship for African Americans was 0.29 percent in 1996 and 0.35 percent in 2004.
- The Latino rate of entrepreneurship increased from 0.38 percent in 1996 to 0.48 percent in 2004, which was higher than the white, non-Latino rate of 0.39 percent.
- Immigrants have substantially higher rates of entrepreneurship than U.S.-born individuals. The average rate of entrepreneurship for immigrants was 0.46 percent compared to 0.35 percent for the U.S.-born.
- Entrepreneurial activity is highest in the West. Other regions have similar rates of entrepreneurship.
- Entrepreneurship activity increased most in the West and South in the past few years. The entrepreneurship rate in the West increased from 0.42 percent in 2001 to 0.49 percent in 2004, and the entrepreneurship rate in the South increased from 0.35 percent to 0.41 percent.
- The construction industry has the highest rate of entrepreneurship among all major industry groups.

Introduction

Using matched data from the 1996–2004 Current Population Surveys (CPS), the new Kauffman Index of Entrepreneurial Activity measures the rate of business creation at the individual owner level. The detailed demographic information available in the CPS and large sample sizes allow for the estimation of separate indices by gender, race, education, region, age, immigrant status, and major industries.

The CPS, conducted monthly by the U.S. Bureau of the Census and the Bureau of Labor Statistics (BLS), is used to create a time series of entrepreneurship rates. All business owners are captured in the CPS microdata, including those who own incorporated or unincorporated business, and those who are employers or non-employers. To create the Kauffman Index, all individuals ages 20–64 who do not own a business as their main job are identified in the first survey month. By matching CPS files, it is then determined whether these individuals own a business as their main job with fifteen or more usual hours worked per week in the following survey month. The Kauffman Index is thus defined as the percent of the population of non-business owners who start a business each month. Average monthly rates of entrepreneurship are calculated by quarter and year. More details about the data sets and measures used are provided in the Appendix.

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Despite major changes in the economy during the strong growth period of the late 1990s, entrepreneurship rates did not change substantially during this time.

Trends in Entrepreneurship

Figure 1 reports average monthly estimates of the Kauffman Index by quarter from 1996 to 2004, and Table 1 presents average monthly estimates of the Kauffman Index by year from 1996 to 2004. The average rate of entrepreneur-

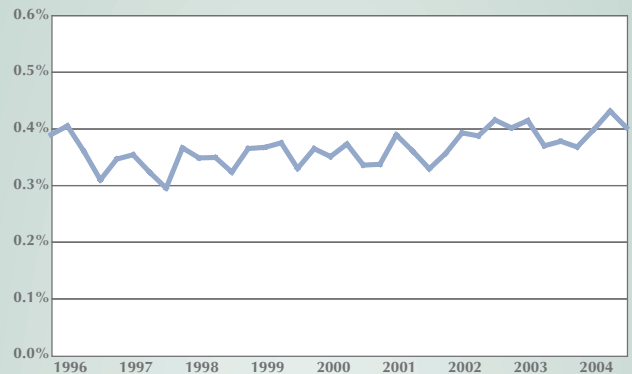
ship over the entire period was 0.36 percent. Thus, an average of 0.36 percent of the adult population created a new business each month. This represents approximately 550,000 new businesses per month over the period.

The rate of business creation was generally between 0.3 and

0.4 percent over the period. Although there does not appear to be a strong trend in the Kauffman Index in the late 1990s, entrepreneurship appears to be higher in the past couple of years than in the earlier period. The average monthly rate of entrepreneurship was 0.36 percent in 1996, 0.35 percent in 2001, and rose to 0.40 percent in 2004. Entrepreneurship also appears to follow a seasonal pattern, with a dip usually occurring in the fourth quarter of each year.

The relative constancy of the Kauffman Index is somewhat surprising in light of the major changes in the economy occurring over this period. Entrepreneurship did not change substantially in the strong growth period of the late 1990s. Moreover, the recession of the early 2000s did not result in a major change in entrepreneurship rates. Although the returns to becoming an entrepreneur may have increased in the 1990s and fell in the 2000s, changes in the returns to wage/salary work may have offset these forces.

FIGURE 1
KAUFFMAN INDEX OF
ENTREPRENEURIAL ACTIVITY
 Average Monthly Estimate by Quarter
 (1996–2004)



SOURCE: Robert W. Fairlie, University of California, Santa Cruz using the Current Population Surveys.

TABLE 1
KAUFFMAN INDEX OF
ENTREPRENEURIAL ACTIVITY
 Average Monthly Estimate by Year and Gender
 (1996–2004)

Year	MEN		WOMEN		TOTAL	
	Index	Sample Size	Index	Sample Size	Index	Sample Size
1996	0.45%	248,966	0.29%	293,377	0.36%	542,343
1997	0.42%	250,833	0.25%	292,132	0.33%	542,965
1998	0.40%	252,493	0.29%	293,146	0.35%	545,639
1999	0.44%	254,508	0.28%	295,561	0.36%	550,069
2000	0.45%	255,779	0.27%	294,091	0.35%	549,870
2001	0.43%	274,809	0.28%	315,526	0.35%	590,335
2002	0.50%	300,082	0.29%	346,603	0.39%	646,685
2003	0.51%	296,643	0.28%	343,650	0.39%	640,293
2004	0.50%	290,991	0.31%	336,168	0.40%	627,159

Notes: (1) Estimates calculated by Robert W. Fairlie, University of California, Santa Cruz using the Current Population Surveys. (2) The entrepreneurship index is the percent of individuals (ages 20–64) who do not own a business with fifteen or more hours worked per week in the first survey month that start a business in the following month with fifteen or more hours worked per week.

There is some evidence that African American entrepreneurship rates increased over the past decade.

ENTREPRENEURSHIP RATES BY GENDER

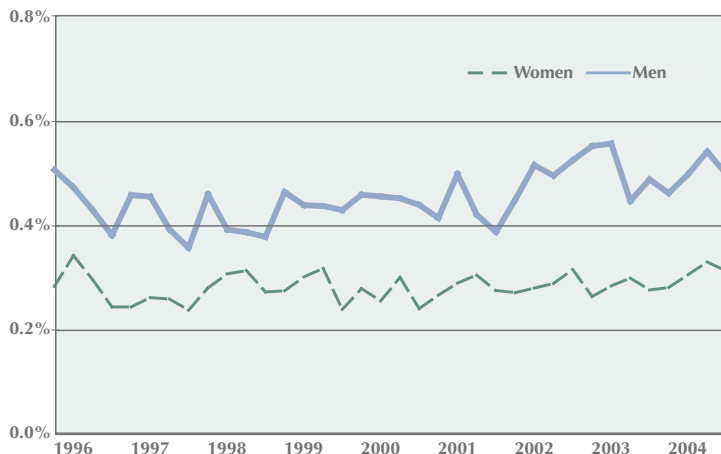
The rate of entrepreneurial activity is substantially higher among men than among women. Figure 2 and Table 1 report estimates of the Kauffman Index by gender. From 1996 to 2004, the average rate of entrepreneurship for men was 0.46 percent. In contrast, the Kauffman Index for women was only 0.28 percent. In every quarter and year, entrepreneurial activity was substantially higher for men than for women. Men's entrepreneurship rates also appear to be more cyclical than women's rates and were higher in the past couple of years than in earlier years. The rate at which women are starting new businesses does not appear to have changed over the past decade. The entrepreneurship rate for men was 0.43 percent in 2001 and rose to 0.50 percent in 2004.

Men's entrepreneurship rates appear to be more cyclical than women's rates.

ENTREPRENEURSHIP RATES BY DEMOGRAPHIC GROUPS

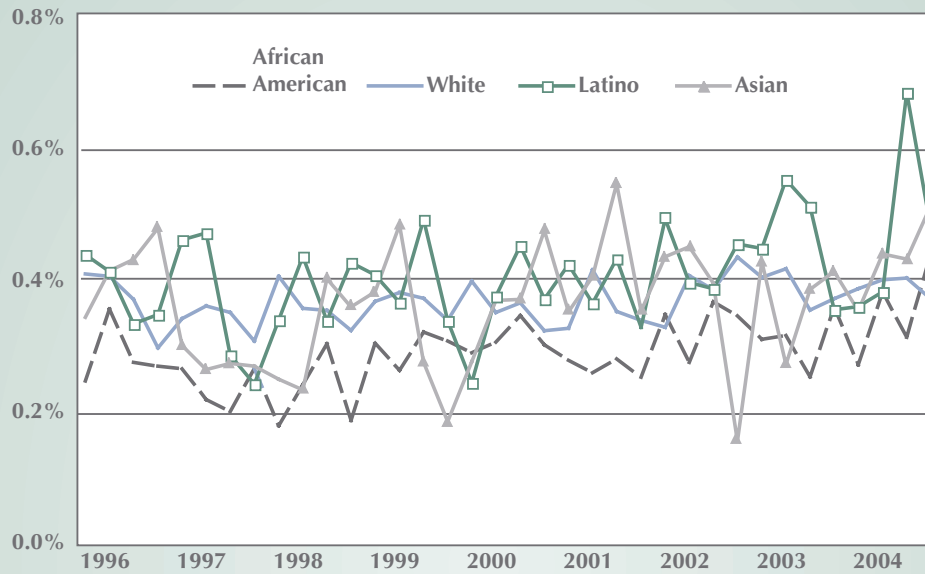
The detailed demographic information available in the CPS and large sample sizes also allow for estimates of entrepreneurship rates by race, education, region, age, and immigrant status. Figure 3 and Table 2 report estimates of the Kauffman Index by race and ethnicity. Overall, entrepreneurship rates are highest for Latinos at 0.41 percent. Non-Latino whites and Asians have an average rate of 0.37 percent. African Americans have entrepreneurship rates that are substantially lower at 0.29 percent. There is some evidence, however, that African American entrepreneurship rates increased over the past decade. The average rate of entrepreneurship for African Americans was 0.29 in 1996, but it increased to 0.35 percent in 2004. Latino entrepreneurship rates also increased substantially over the period. In 1996, the Latino rate was 0.38 percent, and

FIGURE 2
KAUFFMAN INDEX OF ENTREPRENEURIAL ACTIVITY BY GENDER (1996–2004)



SOURCE: Robert W. Fairlie, University of California, Santa Cruz using the Current Population Surveys.

FIGURE 3
KAUFFMAN INDEX OF ENTREPRENEURIAL ACTIVITY BY RACE
 Average Monthly Estimates by Quarter
 (1996–2004)



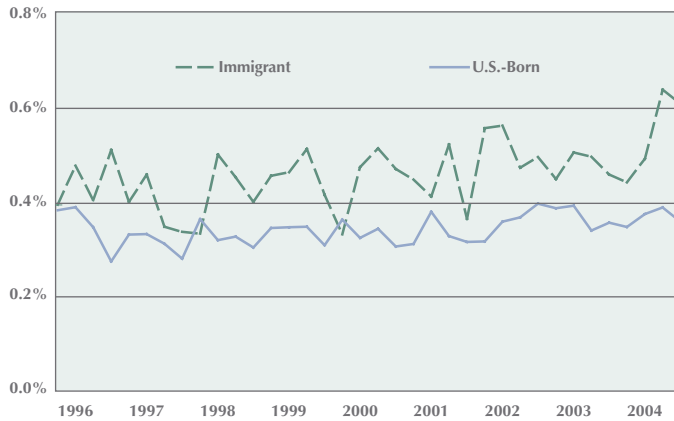
SOURCE: Robert W. Fairlie, University of California, Santa Cruz using the Current Population Surveys.

TABLE 2
KAUFFMAN INDEX OF ENTREPRENEURIAL ACTIVITY BY RACE
 Average Monthly Estimates by Year
 (1996–2004)

Year	WHITE		AFRICAN AMERICAN		LATINO		ASIAN		TOTAL	
	Index	Sample Size	Index	Sample Size	Index	Sample Size	Index	Sample Size	Index	Sample Size
1996	0.37%	412,161	0.29%	57,068	0.38%	45,215	0.42%	21,038	0.36%	542,343
1997	0.34%	410,049	0.24%	57,603	0.37%	46,837	0.28%	21,250	0.33%	542,965
1998	0.36%	411,132	0.23%	57,049	0.39%	48,506	0.31%	21,854	0.35%	545,639
1999	0.37%	412,783	0.30%	57,266	0.40%	51,070	0.33%	22,071	0.36%	550,069
2000	0.36%	406,322	0.31%	58,412	0.36%	54,654	0.37%	22,919	0.35%	549,870
2001	0.36%	438,366	0.27%	62,021	0.39%	56,570	0.42%	25,001	0.35%	590,335
2002	0.39%	484,574	0.33%	65,215	0.43%	60,362	0.36%	27,552	0.39%	646,685
2003	0.39%	471,623	0.31%	63,170	0.47%	62,998	0.38%	25,245	0.39%	640,293
2004	0.39%	459,458	0.35%	61,007	0.48%	62,121	0.44%	25,524	0.40%	627,159

Notes: (1) Estimates calculated by Robert W. Fairlie, University of California, Santa Cruz using the Current Population Surveys. (2) The entrepreneurship index is the percent of individuals (ages 20–64) who do not own a business with fifteen or more hours worked per week in the first survey month that start a business in the following month with fifteen or more hours worked per week. (3) Race and Latino codes changed in 2003. Estimates for 2003 only include individuals reporting one race.

FIGURE 4
KAUFFMAN INDEX OF ENTREPRENEURIAL
ACTIVITY BY NATIVITY (1996–2004)
 Average Monthly Estimates by Quarter



SOURCE: Robert W. Fairlie, University of California, Santa Cruz using the Current Population Surveys.

TABLE 3
KAUFFMAN INDEX OF
ENTREPRENEURIAL ACTIVITY BY NATIVITY
 Average Monthly Estimates by Year

Year	U.S.-BORN		IMMIGRANT		TOTAL	
	Index	Sample Size	Index	Sample Size	Index	Sample Size
1996	0.35%	484,539	0.45%	57,804	0.36%	542,343
1997	0.32%	483,173	0.39%	59,792	0.33%	542,965
1998	0.33%	483,594	0.42%	62,045	0.35%	545,639
1999	0.34%	486,466	0.46%	63,603	0.36%	550,069
2000	0.34%	481,517	0.45%	68,353	0.35%	549,870
2001	0.34%	517,694	0.44%	72,641	0.35%	590,335
2002	0.36%	568,792	0.52%	77,893	0.39%	646,685
2003	0.37%	561,390	0.48%	78,903	0.39%	640,293
2004	0.37%	549,442	0.55%	77,717	0.40%	627,159

Notes: (1) Estimates calculated by Robert W. Fairlie, University of California, Santa Cruz using the Current Population Surveys. (2) The entrepreneurship index is the percent of individuals (ages 20–64) who do not own a business with fifteen or more hours worked per week in the first survey month that start a business in the following month with fifteen or more hours worked per week.

it was 0.48 percent in 2004. The Latino rate in 2004 surpassed the white, non-Latino rate of 0.39 percent in that year.

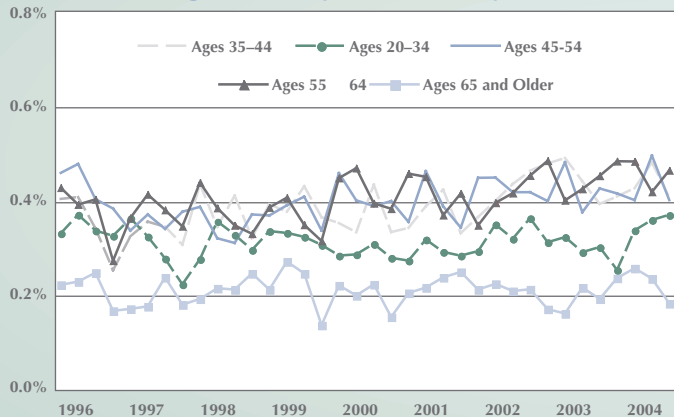
Immigrants have substantially higher rates of entrepreneurship than U.S.-born individuals. Figure 4 and Table 3 report estimates of the Kauffman Index by nativity. The average rate of entrepreneurship for immigrants was 0.46 percent compared to 0.35 percent for the U.S.-born. Although there is some variability in rates over time, there appears to be an upward trend in entrepreneurial activity among immigrants.

For most age groups, entrepreneurship rates are similar and follow the same trends (see Figure 5 and Table 4). Entrepreneurship rates are much lower, however, for both the youngest and oldest groups. The age sixty-five and older group is not included in the main sample and is only reported here for comparison. Older individuals have a much lower likelihood of becoming business owners than other adults because of retirement.

Entrepreneurship rates do not differ substantially by education level. Figure 6 and Table 5 report estimates. The primary exception is that less-educated individuals

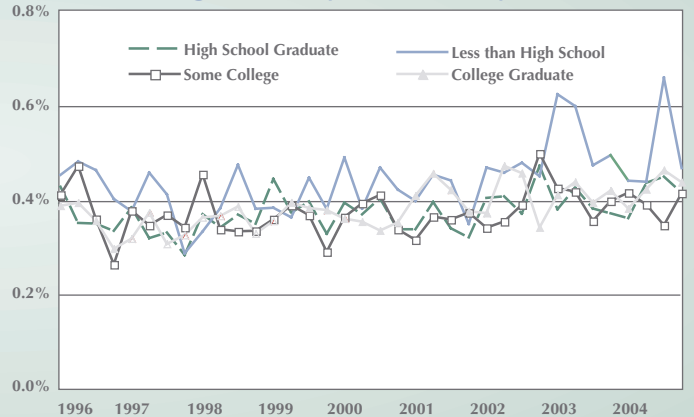
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FIGURE 5
KAUFFMAN INDEX OF ENTREPRENEURIAL
ACTIVITY BY AGE (1996–2004)
 Average Monthly Estimates by Quarter



SOURCE: Robert W. Fairlie, University of California, Santa Cruz using the Current Population Surveys.

FIGURE 6
KAUFFMAN INDEX OF ENTREPRENEURIAL
ACTIVITY BY EDUCATION (1996–2004)
 Average Monthly Estimates by Quarter



SOURCE: Robert W. Fairlie, University of California, Santa Cruz using the Current Population Surveys.

TABLE 4
KAUFFMAN INDEX OF ENTREPRENEURIAL ACTIVITY BY AGE
 Average Monthly Estimates by Year
 (1996–2004)

Year	AGES 20–34		AGES 35–44		AGES 45–54		AGES 55–64		TOTAL	
	Index	Sample Size	Index	Sample Size	Index	Sample Size	Index	Sample Size	Index	Sample Size
1996	0.34%	198,112	0.35%	151,236	0.43%	115,505	0.37%	77,490	0.21%	129,200
1997	0.30%	194,710	0.33%	152,218	0.35%	117,700	0.37%	78,337	0.19%	129,173
1998	0.31%	191,292	0.38%	151,130	0.35%	122,369	0.37%	80,848	0.21%	128,432
1999	0.32%	186,758	0.39%	151,502	0.37%	127,819	0.36%	83,990	0.21%	128,033
2000	0.29%	186,041	0.36%	150,064	0.41%	129,697	0.42%	84,068	0.20%	121,566
2001	0.29%	195,932	0.37%	158,545	0.39%	144,043	0.42%	91,815	0.22%	136,420
2002	0.33%	212,487	0.41%	171,251	0.43%	158,335	0.40%	104,612	0.21%	143,709
2003	0.30%	207,834	0.45%	164,825	0.42%	158,607	0.44%	109,027	0.18%	147,346
2004	0.33%	202,190	0.43%	156,488	0.43%	156,777	0.46%	111,704	0.23%	144,190

Notes: (1) Estimates calculated by Robert W. Fairlie, University of California, Santa Cruz using the Current Population Surveys. (2) The entrepreneurship index is the percent of individuals who do not own a business with fifteen or more hours worked per week in the first survey month that start a business in the following month with fifteen or more hours worked per week.

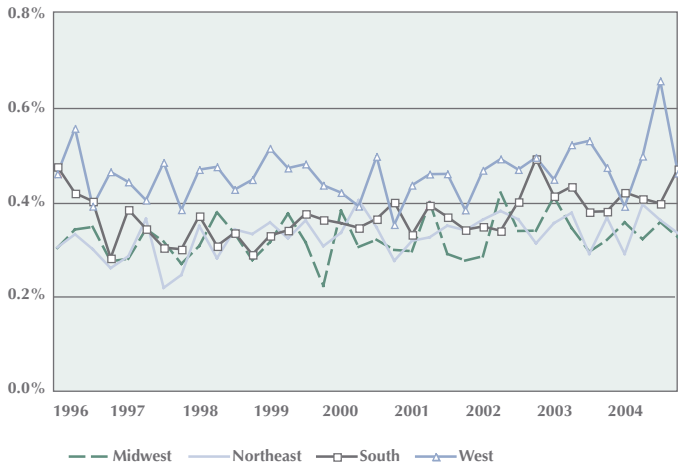
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TABLE 5
KAUFFMAN INDEX OF ENTREPRENEURIAL ACTIVITY BY EDUCATION
 Average Monthly Rates by Year
 (1996–2004)

Year	LESS THAN HIGH SCHOOL		HIGH SCHOOL GRADUATE		SOME COLLEGE		COLLEGE GRADUATE		TOTAL	
	Index	Sample Size	Index	Sample Size	Index	Sample Size	Index	Sample Size	Index	Sample Size
1996	0.46%	65,627	0.36%	165,895	0.38%	128,766	0.36%	123,552	0.36%	542,343
1997	0.38%	64,195	0.33%	165,880	0.36%	128,953	0.33%	126,055	0.33%	542,965
1998	0.39%	62,442	0.36%	164,600	0.36%	129,680	0.36%	130,980	0.35%	545,639
1999	0.39%	60,722	0.38%	163,990	0.35%	132,144	0.38%	135,330	0.36%	550,069
2000	0.44%	59,810	0.37%	161,203	0.37%	133,575	0.35%	135,716	0.35%	549,870
2001	0.41%	62,425	0.35%	171,081	0.35%	145,237	0.41%	148,646	0.35%	590,335
2002	0.46%	66,006	0.41%	186,221	0.39%	159,071	0.41%	166,677	0.39%	646,685
2003	0.54%	64,270	0.39%	182,846	0.40%	156,707	0.41%	167,861	0.39%	640,293
2004	0.50%	62,448	0.41%	177,456	0.39%	154,372	0.42%	165,867	0.40%	627,159

Notes: (1) Estimates calculated by Robert W. Fairlie, University of California, Santa Cruz using the Current Population Surveys. (2) The entrepreneurship index is the percent of individuals who do not own a business with fifteen or more hours worked per week in the first survey month that start a business in the following month with fifteen or more hours worked per week.

FIGURE 7
KAUFFMAN INDEX OF ENTREPRENEURIAL
ACTIVITY BY REGION
 Average Monthly Estimates by Quarter
 (1996–2004)



SOURCE: Robert W. Fairlie, University of California, Santa Cruz using the Current Population Surveys.

appear to have slightly higher rates than other groups throughout the period.

Entrepreneurial activity is highest in the West. Estimates of the Kauffman Index by region are reported in Figure 7 and Table 6. Other regions have similar rates of entrepreneurship. Entrepreneurship increased most in the West and South in the past few years. The entrepreneurship rate in the West increased from 0.42 percent in 2001 to 0.49 percent in 2004, and the entrepreneurship rate in the South increased from 0.35 percent to 0.41 percent.

TABLE 6
KAUFFMAN INDEX OF ENTREPRENEURIAL ACTIVITY BY REGION
 Average Monthly Estimates by Year
 (1996–2004)

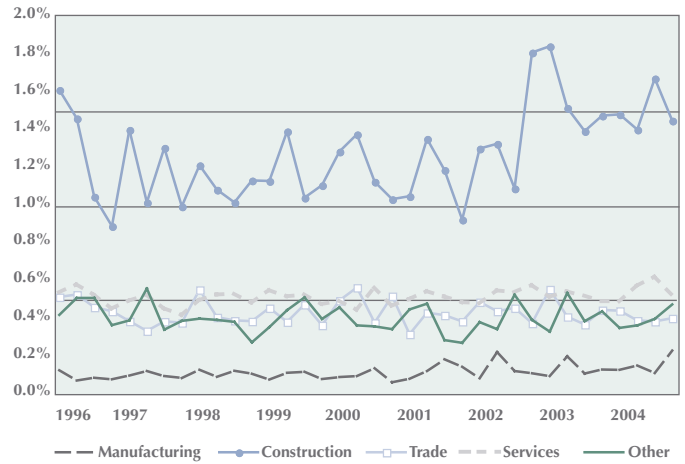
Year	NORTHEAST		MIDWEST		SOUTH		WEST		TOTAL	
	Index	Sample Size	Index	Sample Size	Index	Sample Size	Index	Sample Size	Index	Sample Size
1996	0.29%	117,652	0.31%	128,626	0.39%	167,837	0.46%	128,228	0.36%	542,343
1997	0.27%	117,091	0.29%	127,870	0.33%	167,915	0.42%	130,089	0.33%	542,965
1998	0.32%	117,898	0.32%	127,987	0.32%	167,997	0.44%	131,757	0.35%	545,639
1999	0.33%	117,330	0.30%	128,670	0.34%	169,515	0.46%	134,554	0.36%	550,069
2000	0.33%	116,131	0.32%	130,682	0.36%	169,078	0.41%	133,979	0.35%	549,870
2001	0.33%	127,664	0.31%	144,162	0.35%	175,501	0.42%	143,008	0.35%	590,335
2002	0.35%	140,777	0.34%	161,804	0.39%	185,971	0.47%	158,133	0.39%	646,685
2003	0.34%	139,213	0.34%	160,098	0.39%	184,717	0.48%	156,265	0.39%	640,293
2004	0.34%	134,788	0.33%	154,973	0.41%	186,375	0.49%	151,023	0.40%	627,159

Notes: (1) Estimates calculated by Robert W. Fairlie, University of California, Santa Cruz using the Current Population Surveys. (2) The entrepreneurship index is the percent of individuals (ages 20–64) who do not own a business with fifteen or more hours worked per week in the first survey month that start a business in the following month with fifteen or more hours worked per week.

ENTREPRENEURSHIP RATES BY INDUSTRY

Entrepreneurship rates differ substantially by the industry of the worker. Figure 8 and Table 7 report estimates of entrepreneurship rates by major industry. As expected, entrepreneurship rates are highest in construction at 1.26 percent. Entrepreneurship rates are higher in construction than other industries in every quarter of the sample period. They also show strong seasonality trends and an increase in recent years. Entrepreneurship rates in services are the next highest at 0.50 percent, followed by trade (0.42 percent) and the other category (0.39 percent). Manufacturing has substantially lower rates of entrepreneurship than all other industries. Only 0.11 percent of individuals start businesses in this industry per month.

FIGURE 8
KAUFFMAN INDEX OF ENTREPRENEURIAL ACTIVITY BY INDUSTRY
Average Monthly Estimates by Quarter
(1996–2004)



SOURCE: Robert W. Fairlie, University of California, Santa Cruz using the Current Population Surveys.

TABLE 7
KAUFFMAN INDEX OF ENTREPRENEURIAL ACTIVITY BY INDUSTRY
Average Monthly Estimates by Year
(1996–2004)

Year	CONSTRUCTION		MANUFACTURING		TRADE		SERVICES		TOTAL	
	Index	Sample Size	Index	Sample Size	Index	Sample Size	Index	Sample Size	Index	Sample Size
1996	1.24%	24,425	0.08%	72,324	0.47%	61,428	0.51%	211,113	0.44%	57,281
1997	1.17%	24,516	0.09%	72,324	0.36%	60,836	0.46%	213,894	0.41%	57,061
1998	1.10%	24,878	0.10%	71,143	0.42%	61,403	0.50%	217,706	0.35%	57,026
1999	1.15%	26,031	0.09%	68,524	0.41%	61,872	0.50%	221,319	0.42%	57,140
2000	1.19%	27,173	0.09%	67,352	0.48%	61,583	0.48%	221,889	0.37%	56,929
2001	1.12%	30,006	0.12%	69,669	0.38%	65,417	0.50%	241,823	0.36%	60,143
2002	1.37%	33,043	0.12%	72,275	0.43%	72,286	0.52%	268,830	0.40%	65,125
2003	1.54%	33,026	0.12%	67,581	0.43%	71,884	0.50%	268,083	0.41%	62,34
2004	1.49%	33,178	0.14%	63,971	0.39%	70,407	0.54%	261,601	0.39%	61,028

Notes: (1) Estimates calculated by Robert W. Fairlie, University of California, Santa Cruz using the Current Population Surveys. (2) The entrepreneurship index is the percent of individuals (ages 20–64) who do not own a business with fifteen or more hours worked per week in the first survey month that start a business in the following month with fifteen or more hours worked per week.

Summary

Between 1996 and 2004, an average of 0.36 percent of the adult population created a new business each month, representing approximately 550,000 new businesses per month.

The matched basic monthly files from the Current Population Surveys (CPS) provide a uniquely large, nationally representative panel data set for measuring entrepreneurial activity. The total sample size for the period from 1996 to 2004 for the adult population is more than 7.5 million. The monthly rate of business creation at the individual owner level can be estimated using these data.

The Kauffman Index measures the percent of individuals starting businesses with more than fifteen hours worked per week during the month. The detailed demographic information available in the CPS and large sample sizes allow for estimates of separate indices by gender, race, education, region, age, immigrant status, and major industries.

Between 1996 and 2004, an average of 0.36 percent of the adult population created a new business each month, representing approximately 550,000 new businesses per month. The Kauffman Index did not change significantly during the late 1990s, but rose in the early 2000s. Estimates of the Kauffman Index by gender reveal that new

entrepreneurship is substantially higher among men than among women. The entrepreneurship rate is highest for Latinos, and appears to be much lower among African Americans than other ethnic/racial groups. The African American rate, however, has risen in recent years. Immigrants have higher rates of entrepreneurship than U.S.-born individuals, and entrepreneurship rates are highest in the West. Entrepreneurship appears to be increasing more rapidly in the West and South than in other regions of the country in recent years. Finally, entrepreneurship rates are substantially higher in construction than other major industries. Entrepreneurship rates are lowest in manufacturing.

appendix

DATA

The underlying data sets that are used in this analysis are the basic monthly files to the CPS. By linking the CPS files over time, longitudinal data can be created, which allows for the examination of business creations. These surveys, conducted monthly by the U.S. Bureau of the Census and the Bureau of Labor Statistics (BLS), are representative of the entire U.S. population and contain observations for more than 130,000 people each month. Combining the 1996 to 2004 monthly data creates a sample size of more than 7.5 million observations.

Households in the CPS are interviewed each month over a four-month period. Eight months later they are re-interviewed in each month of a second four-month period. Thus, individuals who are interviewed in January, February, March, and April of one year are interviewed again in January, February, March, and April of the following year. The rotation pattern of the CPS

makes it possible to match information on individuals monthly, and therefore, to create monthly panel data for 75 percent of all respondents in the CPS. To match these data, the household and individual identifiers provided by the CPS are used. The Madrian and Lefgren (2000) suggestion of removing false matches by comparing race, sex, and age codes from the two months is also followed.

After all non-unique matches are also removed from the data sets, the data sets provided by the BLS are checked extensively for coding errors and other problems.

Monthly match rates are generally between 94 and 96 percent, and false positive rates were low for almost every month. There are several reasons for the few months with low match rates and high false positive rates. First, the CPS periodically scrambled the ages of participants in order to protect their confidentiality. In two instances, August and September 2000 and January and February 2001, the age

scramble led to a significantly lower match rate. An age scramble also occurred in December 1998, although the true match rate was not seriously affected. Second, between December 2002 and January 2003, the CPS instituted new race codes, requiring all participants to re-identify their race. The CPS did not recode the old to the new race questions, leading to a higher false match rate. Third, the September to November 2004 Basic Monthly CPS databases contain some observations with missing household identification numbers. When matching from August to September 2004, this leads to a lower true match rate. Fourth, in June 2001 the CPS sample increased due to the SCHIP sample expansion, causing a one month decrease in the match rate and a small increase in the false match rate.

Finally, the primary reason for non-matching is household moves. Therefore, a somewhat non-random sample (mainly geographic movers) will be lost due to the matching routine.

Moves do not appear to create a serious problem for month-to-month matches, however, because the observable characteristics of the original sample and the matched sample are very similar. Appendix Table 1 reports sample means for demographic characteristics and the self-employment rate for the full cross-sectional sample, a sample only containing observations in rotations 1–3 and 5–7, which are the only rotation groups that can be matched to the following month, and the matched sample. The original cross-sectional sample of adults (ages 16+) includes 10,640,052 observations. Only 75 percent of these observations can be matched to the following month, which is captured in the next two columns. The sample size is 7,961,433. As expected, the means characteristics for this sample are nearly identical to the original sample.

The matched CPS sample has a total sample size of 7,555,475 observations. For most characteristics, the matched CPS sample and the full CPS are very similar. Immigrants, Latinos, and young adults are slightly underrepresented and the self-employed are slightly overrepresented in the matched CPS sample compared to the full CPS. These differences reflect higher and lower mobility rates for these groups, respectively.

DETAILED DEFINITIONS

As stated previously, the Kauffman Index uses these matched CPS data over time to create a time series of entrepreneurship rates. All business owners are captured in the CPS microdata, including those who own incorporated or unincorporated business, and those who are employers or non-employers. To create the Kauffman Index, all individuals who do not own a business as their main job are identified in the first survey month. By matching CPS files, it is then determined whether these individuals own a business as their main job with fifteen or more usual hours worked per week in the following survey month. The Kauffman Index is thus defined as the percent of the population of non-business owners who start a business each month. To identify whether they are business owners in each month, responses to the question concerning their main job (defined as the one with the most hours worked) are used. Thus, individuals who start side businesses will not be counted if they are working more hours on a wage/salary job.

In the Kauffman Index, self-employment is counted only if the individual reports usually working fifteen or more hours per week during the second month. The hours restriction is imposed to rule out part-time

business owners and very small business activities. This will understate the percent of individuals creating any type of business. The Kauffman Index also excludes individuals who owned a business and worked less than fifteen hours in the first survey month. Thus, the Kauffman Index does not capture business owners who increase their hours from less than fifteen to fifteen or more. It also does not capture when these business owners initially went from non-business owners to business owners with less than fifteen hours worked. These individuals are excluded from the sample but may have been at the earliest stage of starting a business.

On the other hand, the Kauffman Index may overstate business creation because individuals may simply report not being business owners as their main jobs in a particular month because their wage/salary jobs had more hours, and then the individuals switched to having more hours in business ownership the following month. Thus, small changes in how individuals report their work status may appear as a business creation.

The main sample used to calculate the Kauffman Index includes only adults ages 20–64. For estimates of entrepreneurship rates by education level, the population ages 25–64 is used instead.

These age categories follow the Bureau of Labor Statistics practice of publishing unemployment rates for ages 20+ for total rates and ages 25+ for rates by education. Older individuals are removed

from the main sample to avoid retirement decisions.

APPENDIX TABLE 1
COMPARISON OF FULL CPS SAMPLE TO MATCHED CPS SAMPLE
(1996–2004)

	FULL CPS		CPS WITH MATCHABLE ROTATIONS		MATCHED CPS	
	Percent	Sample Size	Percent	Sample Size	Percent	Sample Size
Men	47.3%	5,031,630	47.3%	3,765,630	47.2%	3,564,302
Women	52.7%	5,608,422	52.7%	4,195,803	52.8%	3,991,173
White	76.4%	8,125,094	76.4%	6,080,903	76.8%	5,805,892
African American	9.7%	1,036,467	9.7%	774,090	9.6%	721,900
Latino	8.5%	899,081	8.5%	672,919	8.3%	623,761
American Indian	1.2%	129,484	1.2%	97,144	1.2%	89,828
Asian/Pacific	3.8%	407,623	3.8%	304,550	3.8%	284,158
Multiple Race (2003)	0.4%	42,303	0.4%	31,827	0.4%	29,936
U.S. born	89.0%	9,470,361	89.0%	7,086,789	89.3%	6,744,285
Immigrant	11.0%	1,169,691	11.0%	874,644	10.7%	811,190
Ages 16–19	7.3%	777,293	7.3%	582,012	7.3%	547,858
Ages 20–29	16.0%	1,707,181	16.1%	1,278,728	15.5%	1,172,423
Ages 30–39	19.4%	2,058,942	19.4%	1,540,800	19.3%	1,455,650
Ages 40–49	20.3%	2,161,500	20.3%	1,617,159	20.5%	1,548,757
Ages 50–59	15.1%	1,607,111	15.1%	1,202,043	15.3%	1,157,455
Ages 60–64	5.4%	574,140	5.4%	429,465	5.5%	414,756
Ages 65+	16.5%	1,753,885	16.5%	1,311,226	16.7%	1,258,576
High School Dropout	19.2%	2,038,612	19.2%	1,525,347	19.1%	1,439,926
High School Graduate	32.0%	3,408,935	32.1%	2,553,759	32.0%	2,420,791
Some College	25.8%	2,750,109	25.8%	2,054,700	25.9%	1,953,660
College Graduate	23.0%	2,442,395	23.0%	1,827,627	23.0%	1,741,098
Northeast	21.6%	2,298,382	21.6%	1,718,540	21.6%	1,635,755
Midwest	24.1%	2,568,473	24.1%	1,922,597	24.3%	1,839,138
South	30.0%	3,192,656	30.0%	2,389,809	30.0%	2,266,480
West	24.3%	2,580,541	24.2%	1,930,487	24.0%	1,814,102
Not Self-Employed	93.7%	9,967,151	93.7%	7,456,695	93.3%	7,047,640
Self-Employed	6.3%	672,900	6.3%	504,738	6.7%	507,835

Notes: (1) Estimates calculated by Robert W. Fairlie, University of California, Santa Cruz using the Current Population Surveys. (2) The Current Population Surveys sample with matchable observations includes month in sample observations 1–3 and 4–7.

SENSITIVITY ANALYSIS

It is useful to examine the sensitivity of the Kauffman Index to alternative definitions. Appendix Figure 1 and Appendix Table 2 provide estimates of the Kauffman Index by quarter using different definitions of entrepreneurship. In Table 2, the Kauffman Index is reported in Column 1. Column 2 reports estimates of an index in which only business owners with less than fifteen usual hours worked per week in the second month are counted. This measure captures small-scale or part-time business owners who do not report wage/salary work as their main job. A relatively large number of individuals report moving from no business ownership to

business ownership with low hours from month to month. Generally, from 0.13 to 0.14 percent of individuals become low-hours business owners. Therefore, estimates of entrepreneurship would be considerably higher if this group were included in the Kauffman Index definition.

Estimates of entrepreneurship are also much higher if all individuals who report less than fifteen hours worked in their business or who do not have a business are included in the first survey month (note that the sample size is now larger). The entrepreneurship rate (shown in column 3) would then increase to roughly 0.6 percent, which is considerably higher than the Kauffman Index. The difference

is large for all quarters.

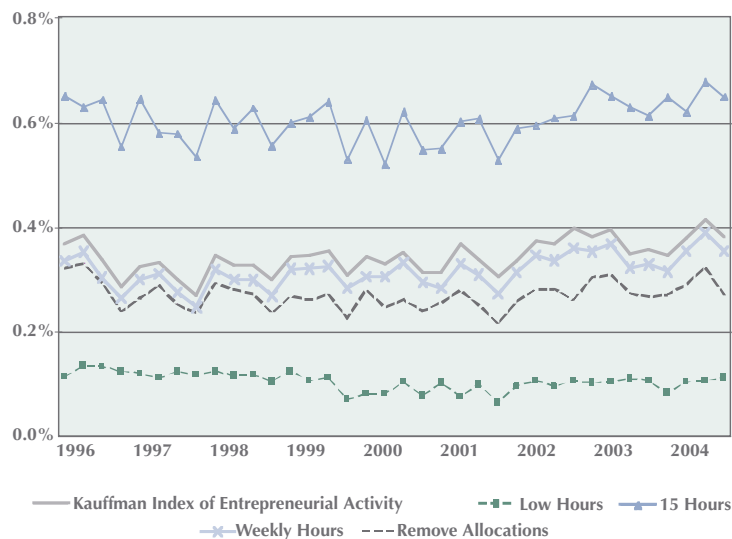
Using the question on hours worked during the survey week rather than the *usual* hours worked per week in the survey month results in a slightly lower entrepreneurship rate in most quarters (see column 4). The pattern of entrepreneurship over time, however, is very similar. Usual hours are used in the Kauffman Index instead of hours worked in the survey week because of concerns regarding vacation or slow weeks (e.g., bad weather for construction).

Finally, the last column in Appendix Table 2 reports estimates of the Kauffman Index after removing all allocated observations. These observations have missing values for either the class of worker question (which identifies self-employment), the current employment status question, or the usual hours worked question. Entrepreneurship rates are somewhat lower after removing these allocated observations, but the time-series patterns are similar to the primary Kauffman Index definition.

TIME PERIODS

The Kauffman Index captures the rate of business creation from month-to-month. Although sample sizes are large in the CPS, business creation is a low probability event. Thus, monthly entrepreneurship rates

APPENDIX FIGURE 1
KAUFFMAN INDEX OF
ENTREPRENEURIAL ACTIVITY
Alternative Definitions of Entrepreneurship
(1996–2004)



SOURCE: Robert W. Fairlie, University of California, Santa Cruz using the Current Population Surveys.

APPENDIX TABLE 2
KAUFFMAN INDEX OF ENTREPRENEURIAL ACTIVITY
SENSITIVITY ANALYSIS USING VARIOUS DEFINITIONS
Average Monthly Estimates by Quarter
(1996–2004)

Year	Quarter	KAUFFMAN INDEX DEFINITION: 15+ USUAL HOURS WORKED		< 15 USUAL HOURS WORKED		MOVEMENT FROM <15 USUAL HOURS TO 15+ USUAL HOURS		15+ HOURS WORKED IN SURVEY WEEK		MAIN DEFINITION: REMOVE ALLOCATED OBSERVATIONS	
		Index	Sample Size	Index	Sample Size	Index	Sample Size	Index	Sample Size	Index	Sample Size
1996	1	0.39%	133,307	0.14%	133,307	0.66%	134,633	0.36%	133,307	0.34%	131,030
1996	2	0.40%	135,385	0.16%	135,385	0.64%	136,503	0.37%	135,385	0.35%	132,769
1996	3	0.36%	135,325	0.16%	135,325	0.65%	136,676	0.33%	135,325	0.32%	133,043
1996	4	0.31%	138,326	0.15%	138,326	0.56%	139,710	0.29%	138,326	0.26%	135,853
1997	1	0.34%	135,077	0.15%	135,077	0.65%	136,530	0.32%	135,077	0.29%	132,522
1997	2	0.35%	135,903	0.14%	135,903	0.59%	137,143	0.33%	135,903	0.31%	133,234
1997	3	0.32%	134,509	0.15%	134,509	0.59%	135,780	0.30%	134,509	0.28%	132,053
1997	4	0.29%	137,476	0.15%	137,476	0.55%	138,786	0.27%	137,476	0.26%	135,032
1998	1	0.36%	135,661	0.15%	135,661	0.65%	137,049	0.34%	135,661	0.32%	132,878
1998	2	0.35%	136,502	0.15%	136,502	0.60%	137,673	0.32%	136,502	0.30%	133,759
1998	3	0.35%	135,876	0.15%	135,876	0.63%	137,142	0.32%	135,876	0.30%	132,938
1998	4	0.32%	137,600	0.14%	137,600	0.57%	138,874	0.29%	137,600	0.26%	134,594
1999	1	0.36%	135,646	0.15%	135,646	0.61%	136,914	0.34%	135,646	0.29%	132,084
1999	2	0.37%	136,367	0.14%	136,367	0.62%	137,510	0.34%	136,367	0.28%	132,548
1999	3	0.37%	137,659	0.14%	137,659	0.65%	138,885	0.35%	137,659	0.30%	133,833
1999	4	0.33%	140,397	0.10%	140,397	0.54%	141,567	0.31%	140,397	0.25%	136,542
2000	1	0.36%	137,416	0.11%	137,416	0.61%	138,658	0.33%	137,416	0.30%	133,574
2000	2	0.35%	138,089	0.11%	138,089	0.53%	139,059	0.33%	138,089	0.27%	133,991
2000	3	0.37%	136,608	0.13%	136,608	0.63%	137,738	0.35%	136,608	0.28%	132,520
2000	4	0.33%	137,757	0.11%	137,757	0.56%	138,852	0.32%	137,757	0.26%	133,475
2001	1	0.34%	133,108	0.13%	133,108	0.56%	134,142	0.31%	133,108	0.28%	129,098
2001	2	0.39%	133,190	0.11%	133,190	0.61%	134,224	0.35%	133,190	0.30%	128,742
2001	3	0.36%	161,945	0.13%	161,945	0.62%	163,351	0.33%	161,945	0.28%	156,991
2001	4	0.33%	162,092	0.10%	162,092	0.54%	163,458	0.30%	162,092	0.24%	157,017
2002	1	0.36%	160,132	0.13%	160,132	0.60%	161,490	0.34%	160,132	0.28%	155,398
2002	2	0.39%	161,371	0.14%	161,371	0.60%	162,629	0.37%	161,371	0.30%	156,006
2002	3	0.39%	162,744	0.13%	162,744	0.62%	164,046	0.36%	162,744	0.30%	157,284
2002	4	0.41%	162,438	0.14%	162,438	0.62%	163,759	0.38%	162,438	0.28%	156,914
2003	1	0.40%	162,230	0.13%	162,230	0.68%	163,674	0.37%	162,230	0.33%	156,714
2003	2	0.41%	160,344	0.13%	160,344	0.66%	161,705	0.39%	160,344	0.33%	154,500
2003	3	0.37%	158,411	0.14%	158,411	0.64%	159,762	0.34%	158,411	0.30%	152,729
2003	4	0.38%	159,308	0.14%	159,308	0.62%	160,594	0.35%	159,308	0.29%	153,311
2004	1	0.37%	158,419	0.12%	158,419	0.65%	159,895	0.34%	158,419	0.29%	152,567
2004	2	0.40%	156,054	0.14%	156,054	0.63%	157,335	0.37%	156,054	0.31%	150,201
2004	3	0.43%	154,364	0.14%	154,364	0.68%	155,667	0.41%	154,364	0.34%	148,372
2004	4	0.40%	158,322	0.14%	158,322	0.66%	159,716	0.37%	158,322	0.29%	152,235

Notes: (1) Estimates calculated by Robert W. Fairlie, University of California, Santa Cruz using the Current Population Surveys. (2) The entrepreneurship index is the percent of individuals (ages 20–64) who do not own a business with fifteen or more hours worked per week in the first survey month that start a business in the following month with fifteen or more hours worked per week.

are aggregated by quarter and year. These measures capture the average monthly rate of entrepreneurship per quarter or year. Annual and quarterly entrepreneurship rates can also be calculated by matching individuals from one year to the next or from rotation 1 to 4 or rotation 5 to 8. Match rates and initial sample sizes, however, are substantially lower. Also, these measures will tend to understate entrepreneurship as they do not capture short spells of business ownership.

DEMOGRAPHIC BREAKDOWNS

The large sample sizes available in the CPS allow one to estimate entrepreneurship rates for detailed demographic groups and industries.

Entrepreneurship rates are calculated by gender, race, education, region, age groups, immigrant status, and industry. Race and industry experienced major changes in coding over the 1996 to 2004 period. Although every effort was devoted to creating consistent coding over time, definitions are not perfectly consistent over time.

COMPARISON TO OTHER MEASURES

The Kauffman Index differs from many other measures of entrepreneurship in that it measures flows into business ownership rather than the

number of existing businesses at a specific point in time. Other measures of the number of entrepreneurs in the United States are readily available from several nationally-representative government data sets. For example, the Economic Census: Survey of Minority-Owned and Female-Owned Business Enterprises provides estimates of the number of small businesses every five years, and the CPS and Census of Population provide estimates of the number of self-employed business owners annually and every decade, respectively. Typical measures of business ownership based on these data, however, do not capture the dynamic nature of entrepreneurship that the Kauffman Index illustrates.

The Kauffman Index differs from the recently released 2002 Survey of Business Owners (SBO) conducted by the U.S. Census Bureau in several major ways. First, the Kauffman Index is based on household survey data and measures individual business owners. The SBO includes all firms operating during 2002 that filed tax forms as individual proprietorships, partnerships, and any type of corporation. Second, the Kauffman Index captures business entry, whereas the SBO captures numbers of existing businesses. Increases in the number of existing businesses over time

may be a result of more business creation, less business closure or a combination of the two. Third, the Kauffman Index only includes individuals starting businesses as their main work activity with a substantial hours commitment. The SBO includes all firms with receipts of \$1,000 or more, which may include side or "casual" businesses owned by wage/salary workers, the unemployed or retired workers. Finally, the Kauffman Index includes all new business owners, whereas the SBO excludes agricultural and a few other types of businesses.

Finally, the Kauffman Index also differs from the Total Entrepreneurial Activity (TEA) index used in the Global Entrepreneurship Monitor. The TEA captures individuals ages 18–64 who are involved in either the start-up phase or managing a business that is less than forty-two months old (Reynolds, Bygrave and Autio 2003). The Kauffman Index differs from the GEM measure primarily because it does not capture young businesses that are more than one year old. The measure of entrepreneurship defined here captures entrepreneurs only once when they first create their business.

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