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BIRTHS, DEATHS, AND ECONOMIC GROWTH: HOW IMPORTANT IS CHURN FOR STATE GROWTH?

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Thanks to Robert Solow and Trevor Swan, we have a better understanding of the role that technological progress plays as a force for economic growth.¹ Independently, Solow and Swan each arrived at the insight that technological progress is captured by the way in which existing capital and labor are combined to yield greater output. Or, alternatively, technological progress means that a company can produce a given level of goods or services at a lower cost. This is a fundamental insight at the 30,000-foot level.

At a practical level, new technologies are harnessed at the company level. But technology adoption does not

occur at the same pace across all firms. Consequently, firms that adopt new technologies quickly will have a cost-advantage over companies that adopt new technologies slowly. Indeed, the adoption rate can explain why companies are born and others die. The term *churn* describes the process of new operations opening and others closing. To the extent that rapid application of new technologies provides a competitive advantage, churning reflects the discovery of new technologies and the differential rate at which companies adopt the new technologies.

In part, churn is one of the chief reasons that so many people believe

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that startups play an important role in economic growth. Remember that technological progress, by definition, involves an untested idea or process. Someone must be willing to experiment in order to realize the returns offered by a technological advance. For an existing firm, there is a tradeoff in the sense that research and development expenditures reduce today's bottom line, and the future returns are not guaranteed. For both established firms and startups, experimentation involves a tradeoff between the expense of research and development and the potential (but not the certainty) of future returns. However, for startups the risk-reward balance may favor experimentation for two reasons: First, independent of experimentation, starting a new company is an uncertain venture that may be more attractive to those with relatively high tolerance for risk; that risk tolerance may manifest itself as a willingness to experiment with new technology. On the reward side, ownership of the fruits of experimentation can offer benefits (both financial and personal) to the entrepreneur that might provide additional incentive to accept the risk that comes with experimentation. Insofar as startups are freer to experiment, they will be associated with faster economic growth; without entrepreneurial experimentation, it would take longer to find out which ideas represent technological progress and which ones fail.

The purpose of this essay is to look at churn and its relation to economic growth. We do not have direct observations of startups. Fortunately, there are data from the Census Bureau's Business Dynamics Statistics that report on the births and deaths of establishments. An establishment is the physical location at which companies meet their customers. A single company can have lots of establishments—think chain stores—or just one. We will use the data on the births and deaths of establishments at the state level to study the relationship between churn and employment growth. This level of detail provides some idea of the dynamism that is occurring within each state.

It is important to clarify the difference between a *new establishment* (as the term is used in the Census Bureau's report) and a *startup*. New establishments encompass both startups and new locations of already-existing companies. We should note also that the Census data measure the number of establishments on a given date from year to year. This means that new establishments that both open

and close their doors within the same year might not be captured in the Census data. With these caveats in place, the analysis still adds to our understanding of the relationship between churn and economic growth. Indeed, because Missouri has struggled with slow growth over the past two decades, the results could help researchers identify regulations that inhibit new establishments being formed in our state. Because churn consists of establishments that are being born and establishments that are dying, we can study how births and deaths separately are related to economic growth across states.

One last issue: The analysis focuses on long-run outcomes over three decades. Specifically, I compute the average annual flow of new and dying establishments across states. In this way, I get rid of influences associated with business cycles.

This study addresses four questions:

1. Do states with a greater number of entering establishments grow faster than states with fewer entering establishments?
2. Do states with a greater number of entering establishments also have a greater number of exiting establishments?
3. Do states with a larger percentage of jobs created by entering establishments grow faster than states with a smaller percentage of jobs created by entering establishments?
4. Do states with a larger percentage of jobs destroyed by exiting establishments grow faster than states with a smaller percentage of jobs destroyed by exiting establishments?

The questions are by no means exhaustive, but are intended to identify a set of patterns across states. In other words, let's start with some basic facts and then we can move on to harder questions.

I start with a description of the dataset and the key variables used in this analysis. I report the average annual values by state for the following variables: employment growth, the number of entering establishments, the number of exiting establishments, the fraction of jobs

created by entering establishments, and the fraction of jobs destroyed by exiting establishments. In addition, I report the correlation coefficients between employment growth and the variables.

Because I introduced this essay by referencing startups, you may be asking a basic question: Why is the number of entering establishments a good measure of churn? Existing firms that open new shops would be recorded as new establishments. Obviously, such a new establishment is not the same thing as a startup. The chief reason is that the flow of new and dying establishments better captures the idea of the full extent of the churn that is going on in the economy than the appearance and disappearance of startups alone.

THE DATA

The Census Bureau's Business Dynamics Statistics (BDS) document entering and exiting businesses. This dataset covers the period from 1977 through 2013. In this study, I use the data on establishments. A firm will consist of one or more establishments.² So a new establishment could be a new firm or a new operating location for an existing firm. The BDS measures the number of establishments in each state as of March 12 of each year. To illustrate, a new establishment is one that is operating on, say, March 12, 1991, but was not operating on March 12, 1990. Conversely, an exiting establishment is one that was operating on March 12, 1990, but was not operating on March 12, 1991.³

In this essay, economic growth is measured by employment growth. The advantage of using employment growth is that we have a consistent measure of nonfarm, payroll employment back to 1977. Unfortunately, there is no consistent measure of real GDP growth before 1997. Thus, we forego a broader measure of economic activity and use employment growth in order to obtain a longer history of economic growth.⁴

For both entering establishments and exiting establishments, I use two different measures. First, I examine the level, or number, of entering and exiting establishments for each state in order to determine whether the number of new establishments or the number of dying establishments is related to economic

growth. It is possible, indeed likely, that the number of new or dying establishments will be highly correlated with the size of the state and not anything related to economic growth. In other words, states with lots of people will also have lots of new establishments and lots of dying establishments. Accordingly, I also include the rate of entering establishments and the rate of exiting establishments by state. I define the *rate* of entering establishments as the number of new establishments divided by the total number of existing establishments. Likewise, the rate of exiting establishments is the number of exiting establishments divided by the total number of establishments. The rates effectively control for size of state and focus on the pace of establishment births and establishment death.

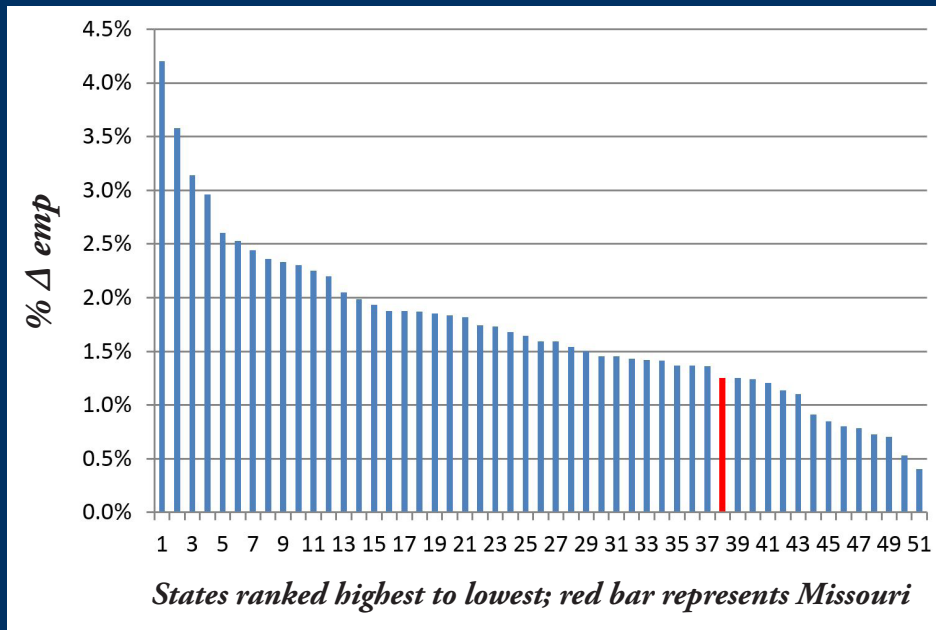
The dataset also includes measures of the number of jobs created by entering establishments divided by total nonfarm payroll employment and the number of jobs destroyed by exiting establishments divided by total nonfarm payroll employment. Data on job creation and job destruction rates fill a void in the literature.

In a study on job creation, John Haltiwanger, Ron Jarmin, and Javier Miranda separate the size and the age of the firms they examine. They report that most new establishments for existing firms are for large, older firms.⁵ (This relates to the warning earlier in this essay against assuming that all new establishments are startups.) Haltiwanger et al. conclude that small business is not the engine of employment that many believe it to be. They report that in the United States, after one controls for the firm's age, there is no statistically significant relationship between the size of the firm and its contribution to net job growth. In this essay, I do not control for size of firm. Rather, I focus on the newness of the establishment and also on the departure of the establishment. Clearly, a new establishment captures only the young part of the age distribution of firms. With exiting establishments, we do not know if they are relatively young or old. The intent is to focus on the relationship between new establishments and the rate of overall job growth and also in the relationships between exiting establishments and the rate of overall job growth at the state level.

It is important to note that the findings presented here are consistent with those presented by Haltiwanger and

Figure 1:

Employment Growth Ranking for 50 States and the District of Columbia, 1983–2013.



colleagues, who focus on the dynamism of startups in terms of job creation rates and job destruction rates. They report that within five years, about 40 percent of the jobs initially created by startups have been eliminated by exiting firms. Overall, startups account for roughly one-fifth of the net job growth rate while only accounting for three percent of total employment. In this essay, I present evidence at the state level, indicating that there is a strong, positive relationship between jobs created by entering establishments and jobs destroyed by exiting establishments. More generally, these simple correlations indicate there is a strong, positive relationship between the rate at which establishments enter the state and the employment growth rate. Moreover, there is a strong, positive relationship between the rate at which establishments exit the state and the employment growth rate. As such, this essay extends one of Haltiwanger and colleagues' questions by considering whether overall churn is important to the state's economic growth rate.

In particular, do we see a relationship between economic growth and the number of new establishments across

states? Because we have data on the rate at which establishments exit, the evidence suggests that it is important for startups to occur and for exiters to leave when their time is up. Based on such evidence, I conclude that the worse business environment is one in which regulations keep new establishments from entering and in which subsidies are used to keep existing firms operating.

ENTRY AND EXIT ACROSS THE STATES

Figure 1 plots the annual average rate of employment growth for each of the 50 states and the District of Columbia for the period 1977 through 2013. The growth rates of the states are shown in descending order from left to right. Nevada reported the highest employment growth rate, increasing at a 4.2 average annual rate. Rhode Island reported the lowest employment growth rate, increasing at a 0.4 percent average annual rate. Missouri is represented by the red bar in Figure 1. Between 1977 and 2013, Missouri's employment, on average, increased at a 1.25 percent annual rate. Overall, Missouri's employment growth rate was the 38th-highest.⁶

Is there a relationship between the average annual number of entering establishments in each state and the state's employment growth rate? Figure 2 presents the average annual number of entering establishments by state. The data are reported in descending order from highest number of average annual entrants to lowest. Again, Missouri is represented by a red bar in Figure 2. California reported the highest average annual number of establishments entering with over 88,000. Vermont reported the lowest average annual number with 1900 entering establishments. Missouri was the 15th-highest state, reporting slightly more than 14,000

entering establishments in a typical year. The correlation coefficient for employment growth and average entering establishments across the 50 U.S. states and the District of Columbia is 0.03. Thus, the evidence suggests there is no statistically significant relationship between the number of establishments that start up in a state and the state's employment growth rate.

Is there a relationship between the number of establishments exiting a state and employment growth? Figure 3 reports the average annual number of exiting establishments by state. Here, the data are reported from the lowest number of annual exiting establishments to the highest. Missouri is identified by the red bar. California has, on average, the highest number of exiting establishments, reporting more than 75,000 exiting a year. Arkansas reported the lowest number of exiting establishments, averaging slightly more than 1,600 a year. Missouri was the 15th-highest state, averaging 12,600 exiting establishments a year. Here, the correlation coefficient is $[0.74E(-0.5)]$. So, there is no evidence that the number of exiting firms is related to the employment growth rate across states.

The levels of startups and exiters are not related to employment growth, but the

Figure 2:
Establishment Entry Level Ranking for 50 States and the District of Columbia, 1983–2013.

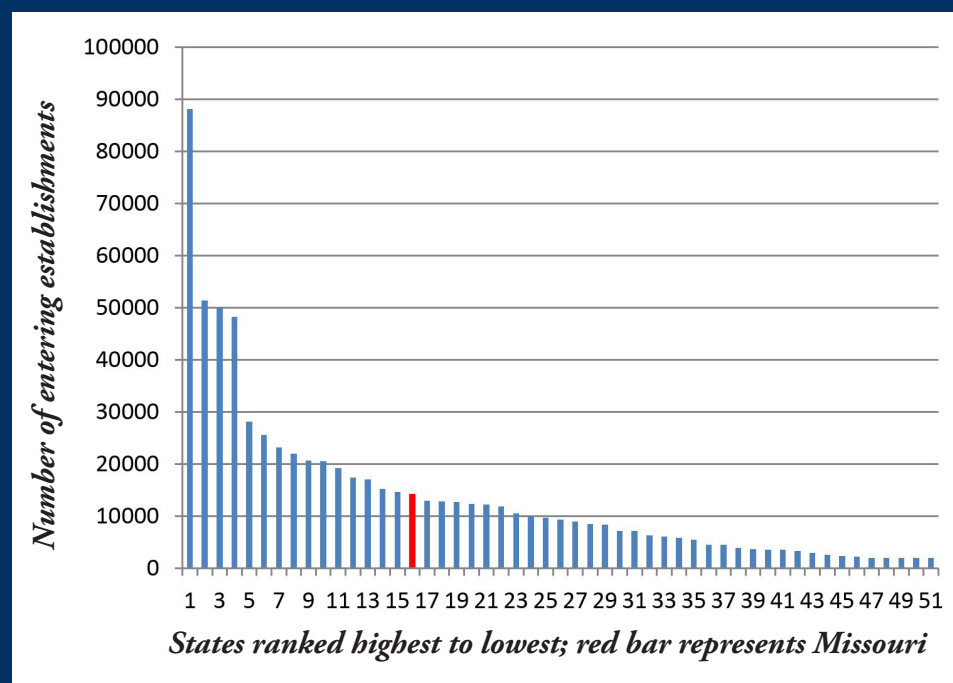


Figure 3:
Establishment Exit Level Ranking for 50 States and the District of Columbia, 1983–2013

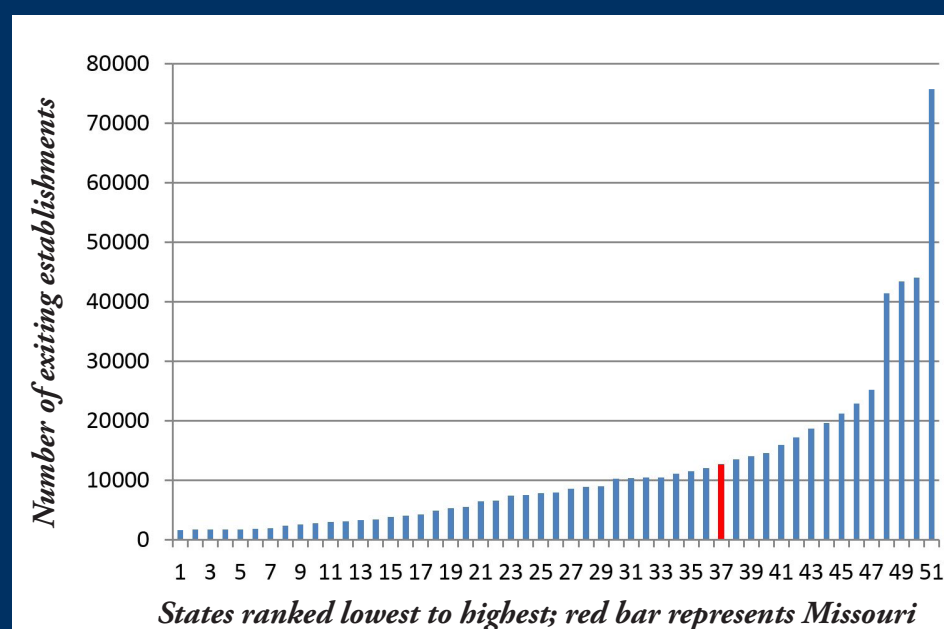
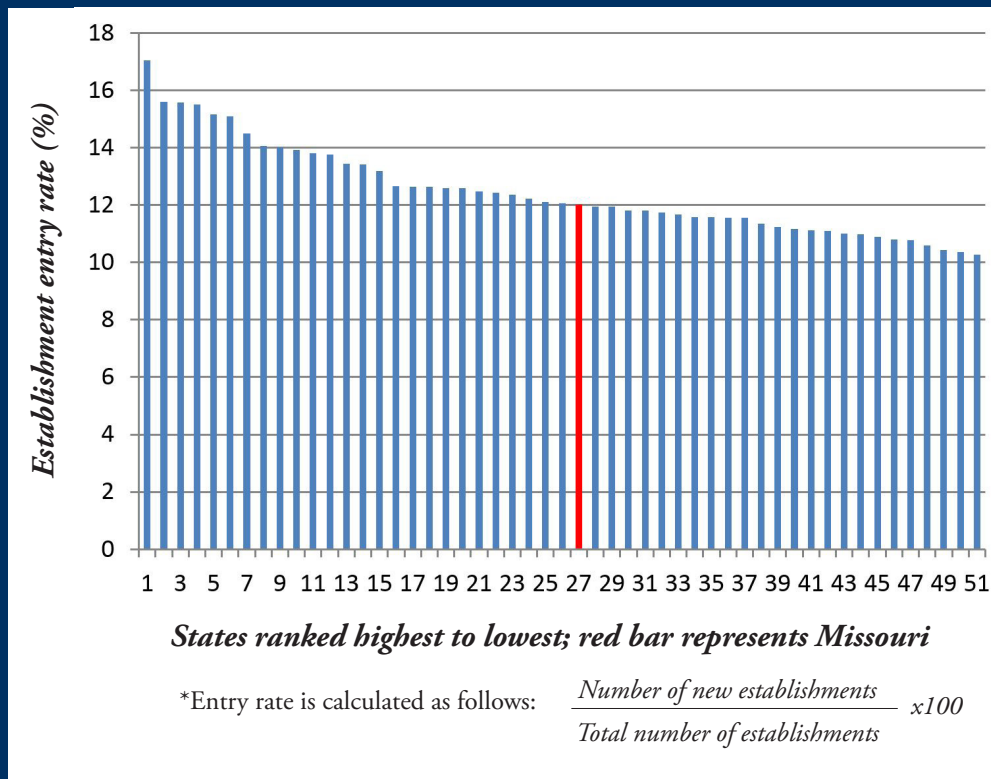


Figure 4:
**Establishment Entry Rate Ranking for 50 States
 and the District of Columbia, 1983–2003***



issue is potentially deeper than that. By looking at the levels of entering and exiting establishments, the evidence mostly follows the same pattern that one sees when looking at population. Big states have lots of startups and lots of exiting establishments. The evidence indicates that there is no systematic relationship between average annual entering establishments and employment growth across states. Nor is there a systematic relationship between the average annual number of exiting establishments and employment growth.

There is another way to analyze the relationship between the flow of establishments and the employment growth rate. Employment growth is a rate of change that is constructed by dividing a change in employment by the level of employment. We can also construct a rate of entering establishments and a rate of exiting establishments. The normalization is straightforward:

simply divide the flow of entering establishments by the number of establishments in the state. Do the same thing for the number of exiting establishments.

Figure 4 plots the average annual entering establishment rate for each state. Missouri is represented by the red bar and is ranked the 27th-fastest state in terms of the average annual rate at which new establishments enter the state. Nevada is the fastest, with an average annual rate of slightly above 17 percent. Iowa is the slowest, reporting an average annual rate of 10.3 percent. Missouri reported an average annual rate equal to 12 percent. The correlation coefficient between the average rate of new establishments entering and employment growth is 0.869.

In other words, states with higher average annual rates of new establishments created, on average, also have faster employment growth. Thus, the evidence supports the view that startups are related to economic growth.

Next, I consider the relationship between employment growth and the average annual rate at which establishments exit. Figure 5 presents the findings for the 50 states and D.C. Here, the ranking is from lowest exit rate to highest. Missouri is represented by the red bar, reporting an average annual exit rate of 10.7 percent, ranking 31st-lowest among the 51 observations. Wisconsin has the lowest exit rate among the states with a 9.24 percent average annual exit rate. Interestingly, Nevada had the highest exit rate, reporting a 12.9 percent average annual rate of exiting establishments. Do states with high average annual exit rates tend to have faster or slower employment growth rates? The correlation coefficient is

0.751, indicating that states with higher average annual exit rates are states that have higher average annual employment growth rates.

If the exit rate and employment growth rate correlation were the only result, the evidence would be very confusing. But this result has to be viewed in conjunction with other results. In particular, it is important to observe the relationship between entry rates and exit rates across states.

States with a high average annual rate of entering establishments are also states with a high average annual exit rate. The correlation coefficient between the average annual entry rate and the average annual exit rate is 0.966. Now it is possible to offer a deeper interpretation of the evidence. In line with the work by John Haltiwanger and others, the simple fact is that many startups fail. Therefore, one implication is that the relationship between the average annual exit rate and employment growth is spurious across states; in other words, it is a statistical fact but there is no causal relationship implied by the correlation.

To further illustrate how the correlation coefficients would both be positive, consider an example with two states. Suppose State A has a higher annual average rate of entering establishments than State B. In addition, suppose that State A also has a faster average annual employment growth rate than State B because of the faster rate at which establishments are being created in State A relative to State B. The new establishments simply require new additional employees. Assume that there is positive relationship between entering establishments and exiting establishments because some positive fraction of startups will fail. Employment growth is, therefore, owing to the

non-failing startups. And, overall, the description can account for three correlations: (1) the positive correlation between entering establishments and employment growth is a product of the need for personnel; (2) the correlation between entering rates and exiting rates reflects the difficulty of succeeding; and (3) the correlation between exit rates and employment growth is an artifact of the first two facts.

We can go a step further and offer an interpretation of the link between startups and the high failure rate. Joseph Schumpeter put forward the idea of *creative destruction*. The gist of Schumpeter's idea is that as new technologies are developed, competition will drive up the rate of entering establishments (the creative part) and drive up the rate of exiting establishments (the destructive part).⁷ Startups are not doomed to failure at a pre-specified rate. Rather, every startup is attempting to offer a good or service at a lower cost compared to previous producers. Some startups will fail (and exit). Those startups that

Figure 5:
Establishment Exit Rate Ranking for 50 States and the District of Columbia, 1983–2003*

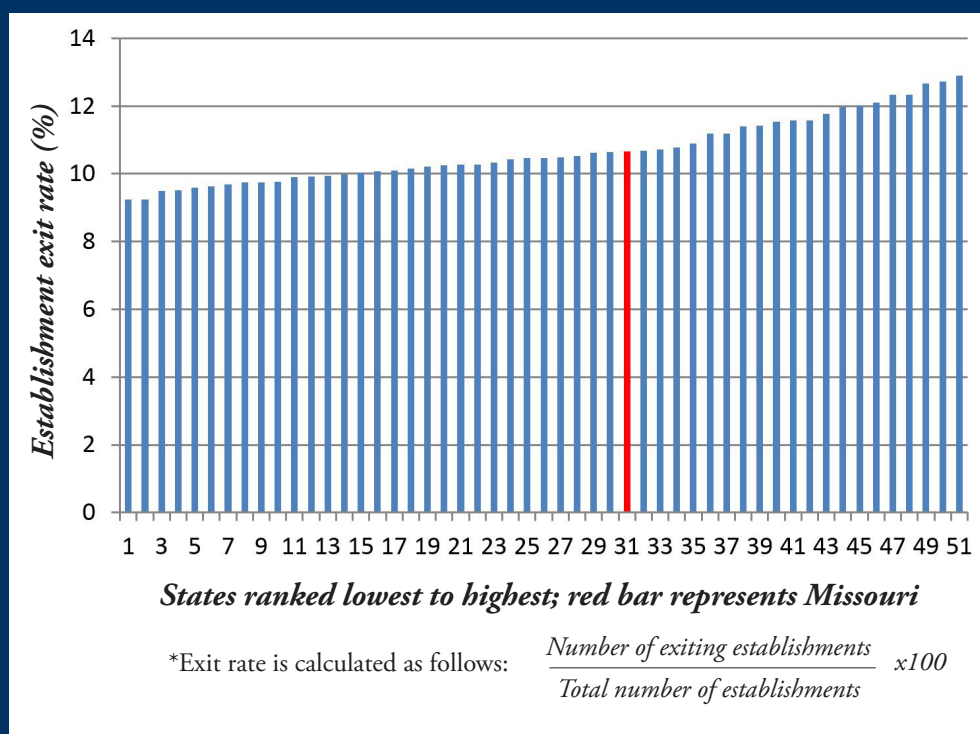
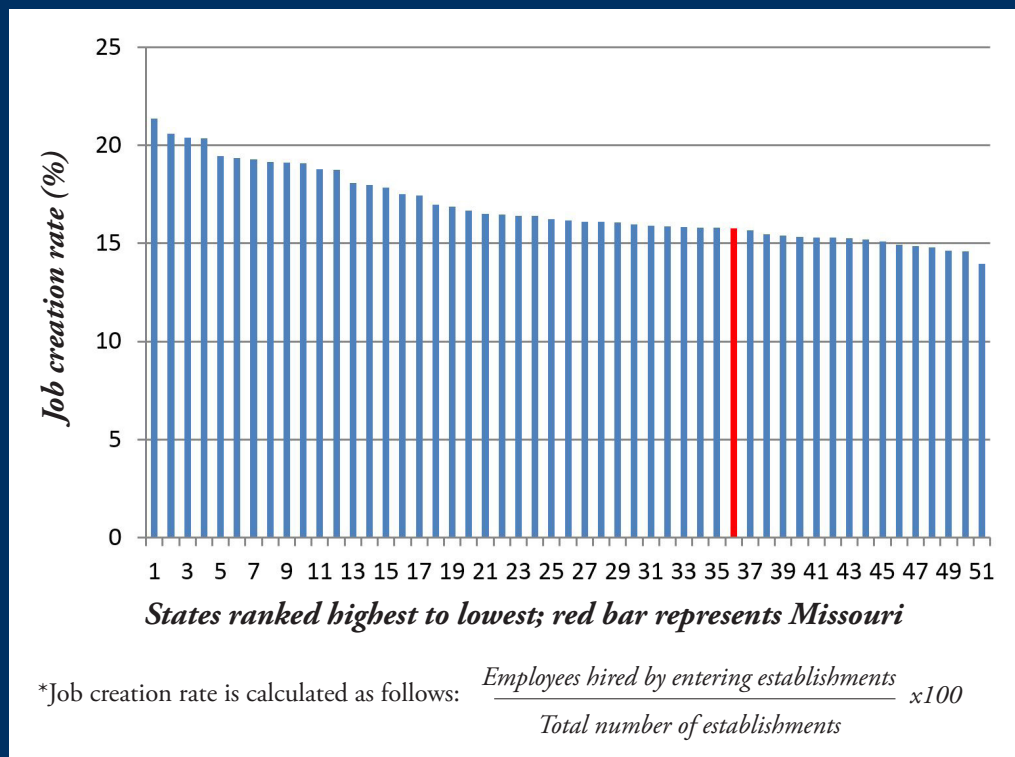


Figure 6:

Job Creation Rate by Entering Establishments: Ranking for 50 States and the District of Columbia, 1983–2003*



succeed become incumbents, to be challenged in turn over time, as subsequent startups experiment with a business plan or technological innovation that offers a product at a lower cost, perhaps driving out the incumbent business.

The key friction in Schumpeter's view can be summarized as follows: existing establishments have invested in mastering a particular technology. When a newer technology is being developed, it is more difficult for the existing establishments (who have incorporated the old technology into complex work flows) to transition to the new technology. Startups, with less invested in previous technology, are more nimble and can invest in implementing the new technology. Because the new technology permits the startup to produce goods and services at a lower cost, the goods and services provided by existing establishments with old technology have a higher relative cost. Eventually, the existing establishments

exit. Thus, states with higher average annual rates for entering establishments are likely to also be states with high average annual rates of exiting establishments without startup failure.

Thus far, the evidence bears on two of the questions raised in the introduction. Overall, there is a positive relationship between the rate, not the level, at which startups enter a state economy and the state's employment growth rate. In addition, I present evidence that states with higher average annual rates of startups also tend to be states with higher average annual rates of exiting establishments. The evidence suggests that startups play an important role in the rate of a state's economic growth. Further, the evidence is consistent with the idea that an important dynamism is present in state economies marked by an environment

in which startups occur and establishments are allowed to exit in a vibrant economy.

EMPLOYMENT GROWTH: EXISTING VS. STARTUPS

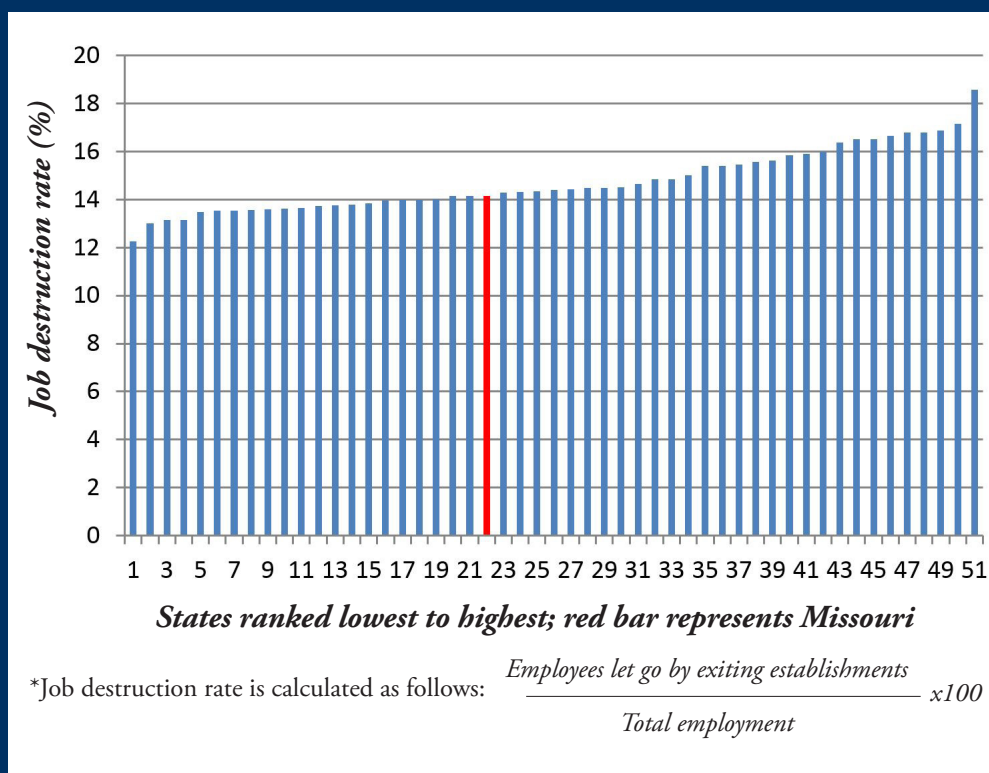
In this part of the essay, I consider the evidence on the relationship between employment growth and the rate at which jobs are created and destroyed at the state level. In general, employees are added by businesses already established and continuing to operate, and also by entering businesses. In other words, the new workers are added to payrolls because existing businesses hire additional workers and because entering establishments hire new workers. So, the two questions here are: (i) do states that have high average annual rates of jobs created by entering establishments also tend to have higher employment

growth?; and (ii) do states with high average annual rates of jobs created by entering establishments also tend to have high average annual rates of jobs destroyed by exiting establishments?

The Census Bureau data report the rate at which jobs are created by entering establishments. The measure we use is the number of payroll jobs added to a state economy by establishments that entered the state economy in a given year divided by the total number of payroll employees.⁸ Figure 6 plots the average annual job creation rate the 50 states and the District of Columbia. Missouri is represented by the red bar and ranks as the 36th fastest state in terms of job creation rate by entering establishments with 15.8 percent of jobs created by entering establishments for an average year. Arkansas reported the highest average annual job creation rate, reporting 21.4 percent of newly created job attributed to entering establishments. Wisconsin reported the lowest average annual job created rate, reporting 13.9 of newly created jobs attributed to entering establishments.

Is there a systematic relationship between the rate of job creation by entering establishments and overall employment growth across states? The correlation coefficient is 0.818, indicating that states with faster employment growth rates tend to be states with higher rates of job creation by entering establishments. This result is different from the allocation of employment offered in the study by Haltiwanger and colleagues. They found that existing firms, not startups, accounted for nearly half of the employment growth at the national level. Here, I am simply reporting the correlation between employment

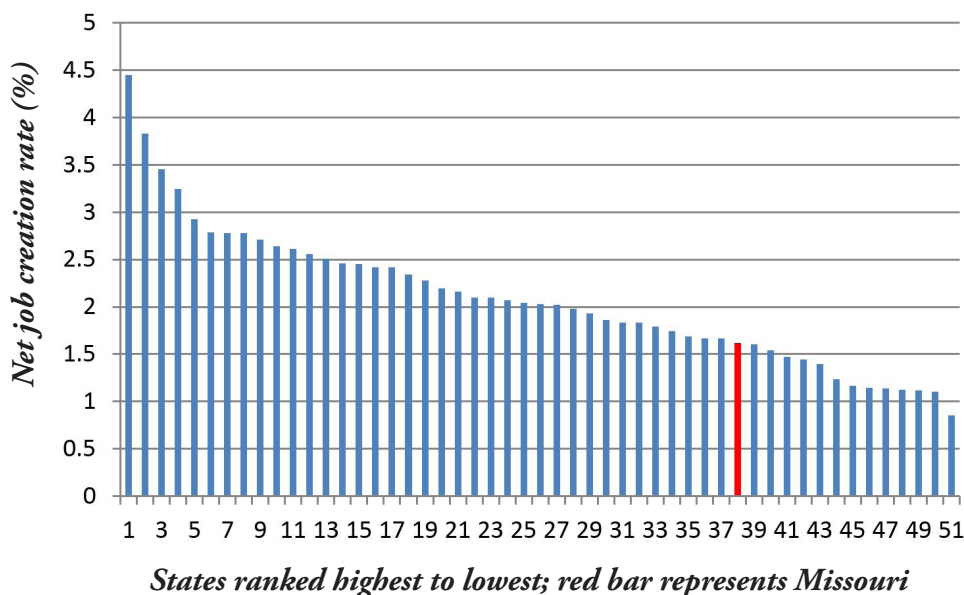
Figure 7:
**Job Destruction Rate by Exiting Establishments:
Ranking for 50 States and the District of Columbia,
1983–2003***



growth and the rate at which jobs are created by startups at the *state* level.

For the sake of completeness and to be parallel with the previous analysis, I consider the rate at which exiting establishments are reducing payroll employment. Figure 7 plots the average annual rate of job destruction by exiting establishments for each state and the District of Columbia. Here, we rank states from the lowest rate to the highest rate. Missouri is represented by the red bar. Missouri is the 22nd-lowest state in terms of rate of job loss due to exiting establishments. Missouri reported that exiting establishments cut 14.1 percent of payroll jobs on average each year. The lowest rate is reported by Wisconsin with job cuts equal to 12.9 percent of payroll employment in an average year. Arkansas reported the highest annual average

Figure 8:
**Net Job Creation Rate*:
 Ranking for 50 States and the District of Columbia,
 1983–2003**



*Net job creation rate is calculated as follows:
$$\frac{\text{Employees hired by new est.} - \text{employees cut by existing est.}}{\text{Total employment}} \times 100$$

rate equal to 18.6 percent of payroll employment cut by exiting establishments. It is interesting that Wisconsin and Arkansas were in the same two spots for the average annual fraction of jobs added to payroll employment by entering establishments. The correlation coefficient between the percent of job destroyed by exiting establishments and the employment growth rate across states is 0.692. Thus, the evidence shows that states with the highest fraction of jobs destroyed by exiting establishments are states that report the fastest employment growth.

To complete the triangle, I compute the correlation coefficient for the average annual fraction of jobs created by entering establishments and the average annual fraction of jobs destroyed by exiting establishments. The correlation coefficient is 0.946. In other words, states in with the largest fraction of jobs created by entering establishments

are also states with the largest fraction of jobs destroyed by exiting establishments. As with startups and exiting establishments, the evidence is consistent with the notion that the greatest economic growth occurs, on average, in jurisdictions in which the greatest churn in jobs happens.

There is another way to check the net contribution that startups have on employment growth. Figure 8 plots the average annual net job creation rate—that is, the difference between the rate of job creation by entering establishments less the rate of job destruction by exiting establishments—for each of the 50 states

and District of Columbia. Missouri is the red bar and has the 39th-fastest net job creation rate, reporting an average annual net job creation rate equal to 1.62 percent. Nevada reported the highest average annual net job creation rate at 4.45 percent while West Virginia reported the lowest rate at 0.86 percent. We find that across states, the average annual net job creation is highly correlated with employment growth. The correlation coefficient is 0.975. So states with startups that create a larger percentage of jobs relative to the jobs destroyed by existing establishments tend to report faster employment growth than states with lower net job creation rates.

By looking at rates of employment by type of establishment, the findings further support the notion that startups and the evident churn that follows are important

factors related to state economic growth. I find that states with high average annual rates of job creation by entering establishments also have higher employment growth rates. In addition, states with high average annual rates of job creation by startups also tend to have high average annual rates of job destruction by exiting establishments.

Note that the evidence is not proof that creative destruction is causing economic growth. But the state-level pattern presented in these data suggests that in states where turnover occurs more rapidly, economic growth is faster

CONCLUDING REMARKS

Unfortunately, Missouri is entering its second decade in which its average annual growth rate is less than the national average annual growth rate. Missouri is lagging behind other states.

Fortunately, the United States' Census Bureau has maintained a remarkable dataset that measures the number of establishments operating within a state each year. With these data, it is possible for researchers to know how many new establishments began operating each year, the number of employees added by these new establishments, the number of establishments that exited, (stopped operating) in a year, and the number of jobs destroyed by the exiting establishments.

In this essay, I started with four descriptive patterns on which these data could shed light. The four questions are really broken into two categories. One is whether there is a statistical relationship between startups and economic growth at the state level. The answer is yes. The other category is whether there is a statistical relationship between establishments being born and those dying. The answer is that there is a positive relationship. Therefore, the evidence supports the view that economic growth depends on startups and the churn in establishments that follows.

The purpose of this essay is to present initial findings. The focus is on long-run observations. The dataset is potentially very useful because it can also characterize lead and lag patterns in these series over time. So there are many more questions that researchers can begin to study at the state level. There are at least two additional questions

raised by this evidence that deserve further study. First, why do entering rates differ so much across states? It is hard to imagine that the outbreak of entrepreneurial spirit is really distributed so unevenly with respect to geography. Rather, the evidence suggests that something about the rules, policies, and regulations in a state can account for why startups occur at high rates in some states and lower rates in others. Second, it is important to use these data to characterize the dynamic relationships between employment growth, entering establishment rates and exiting establishment rates.

No less important is whether policymakers use these results. The descriptions presented in this essay need explanation. One thing that is suggested by the findings is that policymakers should not necessarily respond to change among the businesses operating in their jurisdictions. It is useful to create an environment in which businesses are free from regulatory barriers to entry. In addition, it is important to avoid creating incentives, like subsidies, that keep existing businesses operating beyond their economically useful life.

NOTES

1. See Solow, Robert. 1956. A Contribution to the Theory of Economic Growth. *Quarterly Journal of Economics*, 70:65–94; and Swan, Trevor W. 1956. Economic Growth and Capital Accumulation. *Economic Record*, 32:334–361.
2. Note that a firm with an online presence is considered as an establishment with one location. The computer that is associated with the online presence is treated as the physical location.
3. The data would not register new establishments that began operations after March 12, 1990 and ceased operations before March 12, 1991. The entering establishment is also an exiting establishment within the same year. By the March 12 criterion, these two events are recorded as no net change in the BDS.
4. There are tradeoffs with any measure of economic growth. In this case, some will wonder if including the data over such a long time period is relevant to obtaining current insights into an economy's growth. Since the Great Recession, for example, the factors driving economic growth are likely to be different than those working in

1977. In this view, growth rates are segmented and need to be divided over shorter intervals. The alternative view is that while specific forces driving economic growth do change over time, growth is a low-frequency event. In this essay, I follow the view that the average annual growth is valid, using as many observations as I can to compute this value.

5. See Haltiwanger, John, Ron Jarmin, and Javier Miranda, 2013. Who Creates Jobs? Small versus Large versus Young. *The Review of Economics and Statistics*, 95:2: 347–361. There is evidence that many small businesses are young businesses. Haltiwanger et al. ask whether small businesses can account for most of the job growth in the United States They find that small firms do not contribute disproportionately to employment growth. Their answer depends critically on controlling for firm age. More specifically, young firms do contribute substantially to net job creation. Because new firms tend to be small, Haltiwanger, et al. explain that the relationship between firm size and net employment growth is capturing the fact that most new firms are in the small-firm class.

6. With more data, Missouri ranks somewhat higher than it does when we look at real GDP growth during the period from 1997 through 2014. In previous studies we have reported that Missouri has ranked as low as the 49th-fastest-growing state by real GDP growth. Over the longer period, the evidence suggests that Missouri has not always been such a slow-growth state.

7. Schumpeter developed his ideas in the book, Schumpeter, Joseph A. *Capitalism, Socialism and Democracy*. New York: Harper, 1975. (reprinted from original in 1942.) More recently, the ideas have been further developed in work by Phillippe Aghion and Peter Howitt. See, Aghion, Phillippe and Peter Howitt. 1992. A Model of Growth through Creative Destruction. *Econometrica*. 60(2): 323–351.

8. Formally, the denominator is developed by Davis, Haltiwanger, and Schuh. In each year, the employment number is the average of this year's and the previous year's employment. This employment measure attempts to dampen the effects of transitory shocks that would create a bias in the relationship between net employment growth in the year-to-year values.



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