

Kauffman Foundation Research Series on City, Metro, and Regional Entrepreneurship

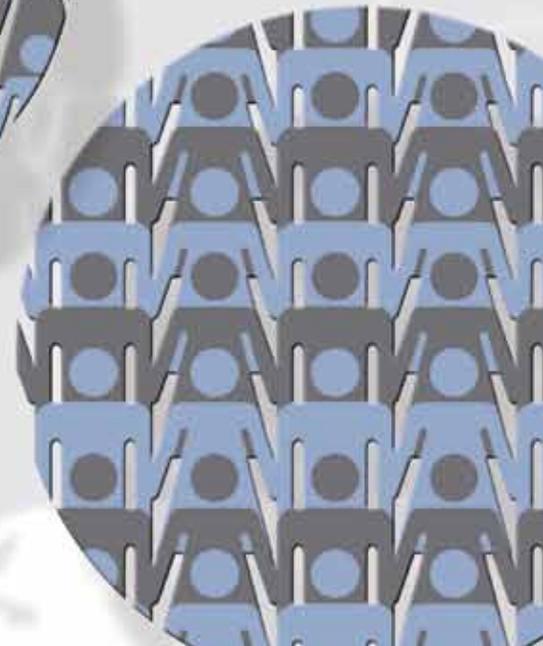
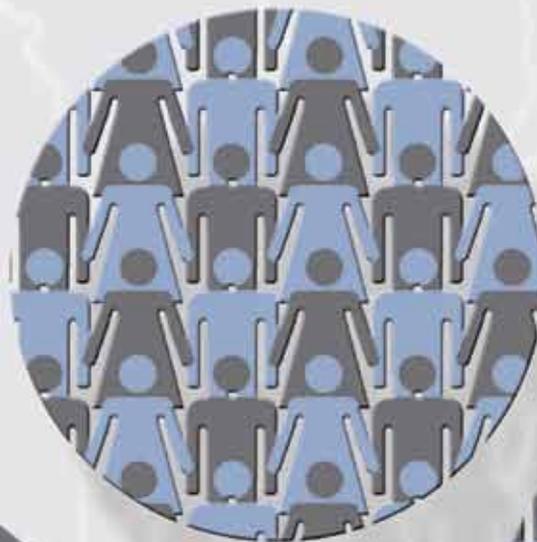
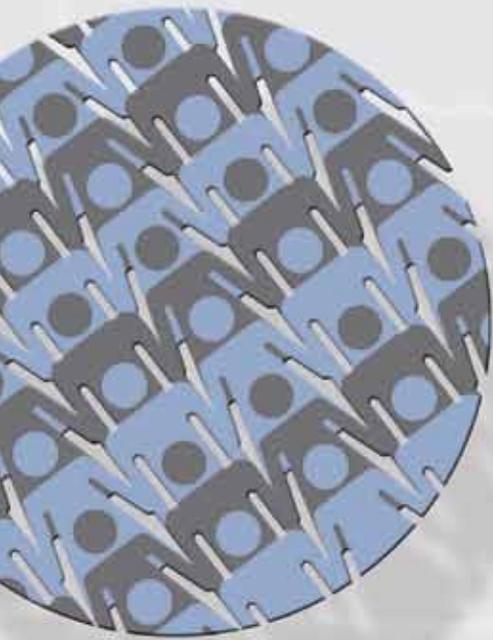
MEASURING AN ENTREPRENEURIAL ECOSYSTEM



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INTRODUCTION

How do you measure your entrepreneurial ecosystem? How should you interpret the data about your startup community? What economic indicators should matter for vibrancy and growth? These questions come up repeatedly in conversations with entrepreneurs, program heads, event organizers, investors, policymakers, and others. The frequency of these queries reflects the phenomenon: With the rapid spread of efforts to build entrepreneurial ecosystems, it's only natural to wonder what outcomes should be tracked. And, what you track depends on what you're trying to achieve.

In some places, the desired outcome is simply more: more entrepreneurs, more companies, and more jobs. Other communities design their ecosystem efforts around a particular type of company or type of job. Some regions, moreover, see the "entrepreneurial ecosystem" as a marketing effort, and focus on a particular type of individual they hope to attract to their area. For other cities, the only thing that matters is the "exit"—initial public offerings and acquisitions.

These are all worthy objectives, and communities must define their own goals. Yet where most places fail is in reliance on a handful of limited input metrics rather than *outcomes*. To judge the vibrancy of their entrepreneurial ecosystems, many states and regions focus on things like research and development funding at universities, available investment capital, and engineering degrees. These may be associated with more entrepreneurial activity, but they are inputs, not necessarily the outcomes to be tracked. Other regions focus on patents or technology licenses out of universities—these are a piece of the puzzle, but they're not necessarily the leading indicators of entrepreneurial vibrancy.

At the other end of the spectrum is the kitchen-sink approach—because every part of an entrepreneurial ecosystem is critically important, you must track everything. This approach has the admirable quality of avoiding Campbell's Law but provides no

sense of prioritization or focus for those community leaders involved in the ecosystem.¹ There must be some middle ground between trying to capture every dimension of an entrepreneurial ecosystem and overly focusing on only one or two indicators.

There are also different levels of measurement for entrepreneurial ecosystems. In this paper, we focus on the overall performance of the ecosystem in terms of outcomes and vibrancy. In future work, we will explore measurement indicators that can be instituted at the level of programs and organizations.

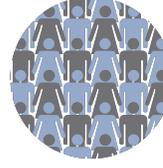
What and How

Here, we propose four indicators that we think answer the question from ecosystem leaders: what do we measure, and how do we measure it?

Indicators of Entrepreneurial Ecosystem Vibrancy
Density
Fluidity
Connectivity
Diversity

For each category, we propose different measures and suggest possible statistical sources for them (see Appendix for greater detail).

MEASURING ENTREPRENEURIAL ECOSYSTEM VIBRANCY

Indicator	Measure	Possible Sources
 DENSITY	New and young firms per 1,000 people	Census Bureau, Business Dynamics Statistics (BDS)
	Share of employment in new and young firms	Census Bureau, BDS
	Sector density, especially high tech	National Establishment Time Series (NETS)
 FLUIDITY	Population flux	Internal Revenue Service
	Labor market reallocation	Quarterly Workforce Indicators (QWI)
	High-growth firms	Inc. 5000 and NETS
 CONNECTIVITY	Program connectivity	Under development
	Spinoff rate	Possibly: CrunchBase; LinkedIn
	Dealmaker networks	Private databases, including Capital IQ
 DIVERSITY	Multiple economic specializations	Quarterly Census of Employment and Wages (QCEW)
	Mobility	Equality of Opportunity project
	Immigrants	American Community Survey (ACS)

What matters is not necessarily a snapshot, but the trajectory over time, so all these measures need to be tracked continuously. The frequency of collection will depend, of course, on availability from data sources, but we suggest annual collection (and, if possible, quarterly or semiannually).

Before we delve into specifics, it's important to note that these suggested indicators are only starting points. We'd like to invite others to revise this list accordingly. What are we missing? What should not be included? What do you track in your region? Where can new sources of data be generated?

Density

Our first indicator of entrepreneurial vibrancy is density, for which we recommend three measurements: density of new and young firms, share of employment in new and young firms, and high-tech (or your preferred sector) density.

To begin with, we want to measure entrepreneurial density. At the core of any entrepreneurial ecosystem are the entrepreneurs themselves, so naturally we want to know how many entrepreneurs are in a given city or region. Pure volume alone, however, is insufficient—you want to know the relative *density* of entrepreneurship, and you also



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want to distinguish among different types of firms. As many research studies have confirmed, new and young companies are not necessarily the same as small businesses, so here we focus on the former as the proper measure of entrepreneurial density.

Density is an important component in the research literature on urban growth, and entrepreneurial density is, as Brad Feld has observed, the statistical corollary of the number of entrepreneurs you'll run into walking across the street.²

The most straightforward way to measure this is the number of new and young companies per 1,000 people in your city or metro area, where "young" can mean less than five or ten years old. This will tell you, in the most basic way, how the level of entrepreneurship changes over time relative to population.

Another way of getting at density is by looking at the employment impact of new and young companies. Entrepreneurial vibrancy should not just be measured by the number of companies—it also should include all the people involved in those companies. Thus, another data point to track is the share of employment accounted for by new and young companies. This will capture founders and employees.

Finally, we want to get some idea of density in terms of specific sectors. Some places already may have a particular economic sector that has been identified as the centerpiece of an ecosystem, such as "creative" industries or manufacturing. We are sector agnostic in this paper, but will use high-technology sectors as an example here because of work that already has been done,³ and because of the multiplier effect that high-tech entrepreneurs can exert on other, non-technology companies.⁴ So, a third density indicator we include here is the density of new and young companies within

specific high-tech sectors (again using population as a denominator).⁵

Our suggested starting points for entrepreneurial density are:

- Number of new and young companies—in your defined geographic area—per 1,000 people⁶
- Share of employment in new and young companies
- High-tech (or other sectoral) startup density

Fluidity

Our second indicator of entrepreneurial vibrancy is fluidity, which we can measure in three ways: population flux, labor market reallocation, and number of high-growth firms.

Phil Auerswald, a professor at George Mason University, describes entrepreneurs as "Lego builders." They take existing resources—the Lego bricks—and recombine them into new creations. The academic literature calls this "*bricolage*" because entrepreneurs typically face severe resource constraints, and must piece together whatever resources they find at hand. This is the essence of entrepreneurial strategy.⁷

From an ecosystem perspective, this means that the entrepreneurial environment must be fluid to enable entrepreneurs to engage in that Lego-building process. In her well-known book, *Regional Advantage*, AnnaLee Saxenian identified this as one of the hallmarks of Silicon Valley.⁸ The obverse, of course, is that limits on fluidity will suppress entrepreneurial vibrancy.

One of the principal resources that entrepreneurs need is people, and population flux should provide a mixing and remixing of people, strengthening entrepreneurial bricolage.

Our first suggested way to measure fluidity is by looking at population flux, or individuals moving between cities or regions. This is how cities “re-sort” and “react adaptively,” and this population flux should lead to the “collisions” that are key to idea generation.⁹ Entrepreneurial vibrancy means people both coming and going.¹⁰ One of the principal resources that entrepreneurs need is people, and population flux should provide a mixing and remixing of people, strengthening entrepreneurial *bricolage*. The data points to track here are, very simply, flows of both in-migration and out-migration.

The second way to look at fluidity is with regard to movement *within* a given region. Population flux tells us about geographic mobility more broadly, but individuals also need to be able to find the right match with different jobs within a region. The pace at which they are able to move from job to job and between organizations (what economists call “reallocation”) also should be an important indicator of vibrancy. Economists have illuminated the value of this process:

The high pace of worker churning in the United States plays a critical role in improving the allocation of workers to jobs—that is, improving the quality of matches between workers and jobs. Moreover, churning (i.e., switching jobs) is very important for wage growth over the life cycle of workers.¹¹

This reallocation, or churn, also has been found to be an important element in regional growth, and barriers to such fluidity will act as an anchor, dragging down entrepreneurial vibrancy.¹² A relatively new dataset, the Quarterly Workforce Indicators, allows us to measure this reallocation directly.

Our third suggested measure of fluidity in an ecosystem is the number (and density) of high-growth firms, which account for a small share of companies, but are responsible for a disproportionate share of job creation and innovation. A concentration of high-growth firms will indicate whether or not entrepreneurs are able to allocate resources to more productive uses and rapidly capitalize on that process of bricolage. Importantly, high growth is not necessarily synonymous with high tech, so data sources here can include lists such as the Inc. 5000, which are loaded with examples of non-tech companies that found relatively small niches, allowing for rapid growth.¹³

Our suggested indicators for ecosystem fluidity are:

- Population flux
- Labor market reallocation
- High-growth firms—number and density

Connectivity

Our third indicator of entrepreneurial vibrancy is connectivity, which we can measure with data on: program connectivity, spinoff rates, and dealmaker networks.

A vibrant entrepreneurial ecosystem is not simply a collection of isolated elements—the connections between the elements matter just as much as the elements themselves. To adopt culinary parlance, recipes matter more than the inventory of ingredients. This applies to programs, companies, and individuals, and the connectivity between them is another gauge of entrepreneurial vibrancy.



First, we recommend looking at connectivity with respect to programs, or resources, for entrepreneurs. Recent years have seen a proliferation of entrepreneurship education and training programs around the world, but the mere existence of programmatic resources is not the same thing as effectiveness, let alone vibrancy.¹⁴ Connections matter, and a dense network of connections, among a small number of programs, is arguably more important than a sparse network among a larger number.¹⁵

Those connections, moreover, should allow you to determine the use of different resources and the interactions between the organizations. The diversity of your entrepreneurial population is likely to be high, and a one-stop shop for serving entrepreneurs is unlikely to do much good in serving all of them.¹⁶ Entrepreneurs move through an ecosystem, piecing together knowledge and assistance from different sources, and the connectivity of supporting organizations should help underpin the development of a strong entrepreneurial network.

In terms of measurement, advances in network analysis should allow us to track resource connectivity, but readily available data on this metric remains limited.

Second, we want to look at connectivity over time, and one of the ways that concept manifests itself is through spinoffs. The entrepreneurial “genealogy” of a given region, as measured by links between entrepreneurs and existing companies, is an important indicator of sustained vibrancy. In Silicon Valley, for example, generations of spinoffs—beginning with the “Traitorous Eight” and then the “Fairchildren”—have helped drive periods of renewal.¹⁷ Elsewhere, a certain company or institution has served as a fertile source of new company creation, whether as officially sanctioned spinouts or in the form of employees leaving to start

something new.¹⁸ This is true in places such as Boston, Austin, Boulder, and Seattle. Researcher Heike Mayer has also found it to be true in so-called “second tier” regions like Boise, Portland, and Kansas City.¹⁹

This genealogy can be captured as the spinoff rate, and we are exploring different ways of measuring this.²⁰ Leaders of a given region should pay attention to the extent to which successive waves of new companies are created—do existing companies produce the next generation, or do they try to suppress it?²¹ Perhaps a corollary indicator that should be explored is some way of measuring the dominance of established firms.

Our third measure of connectivity is the “dealmaker” network: Ted Zoller and Maryann Feldman have looked at the role of these “individuals with valuable social capital, who have deep fiduciary ties within regional economies and act in the role of mediating relationships, making connections and facilitating new firm formation.”²² They are, in other words, dealmakers, and they play a critical role in a vibrant entrepreneurial ecosystem.

As with other measures, we care less about volume here—more important to vibrancy are the number of connections per dealmaker “node,” as well as the links between dealmakers. Zoller and Feldman have already produced excellent network maps of dealmaker connectivity for various cities, but we are still working on ways to make these data even more available and accessible.

Our suggested indicators for ecosystem connectivity are:

- Connections between programs and resources

Connections matter, and a dense network of connections, among a small number of programs, is arguably more important than a sparse network among a larger number.¹⁶

- Spinoff rate
- Dealmaker networks

Diversity

Our fourth indicator of entrepreneurial vibrancy in a given place is diversity, which we propose to measure along three dimensions: economic diversification, immigration, and income mobility.

The first measure of diversity is economic diversification; an important concept because no city or region should be overly reliant on one particular industry. At a country level, research has shown that economic complexity is correlated with growth and innovation.²³ Yet in reality, cities and regions also seek to specialize in certain economic activities because specialization brings comparative advantage and economic gains.

What we have in mind here is not diversity instead of specialization, but a *diversity of specializations*. Cities and regions that specialize in multiple economic areas should enjoy greater entrepreneurial outcomes than those that only specialize in one or two industries.²⁴ To collect data on economic diversification, we recommend looking at location quotients.²⁵

The second measure of diversity in an entrepreneurial ecosystem is the attraction and assimilation of immigrants. Historically, immigrants have a very high entrepreneurial propensity. In the United States, for example, immigrants start businesses at twice the rate of native-born Americans.²⁶ The extent to which cities and regions can attract immigrants and include them in the entrepreneurial ecosystem should thus be an important marker of progress. Importantly,

this should encompass all types of immigrants, from all backgrounds and all skill types. The data collected here should look at the immigrant share of the population and its growth rate over time.

Finally, our third measure of diversity is how well your entrepreneurial ecosystem successfully diversifies opportunity. What is the point, after all, of trying to increase entrepreneurial vibrancy in a region and trying to build an entrepreneurial ecosystem? The purpose is to improve the quality of life for your citizens, to expand opportunity, and to create a virtuous circle of opportunity, growth, and prosperity. Young companies play an important role in the career ladder of young workers—a smaller share of young companies in a city or region conceivably could mean fewer opportunities not only for entrepreneurs but also for young workers to become economically productive.²⁷

Economic mobility, then, should be an important marker for your entrepreneurial ecosystem, measured by data on the probability of moving up or down the economic ladder between different income quintiles.

Our suggested indicators for ecosystem diversity are:

- Multiple economic specializations
- Immigrant share of population
- Economic mobility

Conclusion

We offer these indicators and measures as postulates that require testing, not definitive declarations. These are the indicators we believe to be important for capturing the vibrancy and evolution

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Future work will focus on developing measures for specific programs and actions within an ecosystem.

of an entrepreneurial ecosystem. We realize that we probably have missed many indicators that are likely important to regional leaders and entrepreneurs. Housing affordability, for example, matters for productivity and growth, and some type of land-use indicator likely needs to be included in ecosystem measurement.²⁸ Different places will have different priorities.

Nonetheless, once these baseline indicators are in place and the data are collected and tracked, they should give those involved in an entrepreneurial ecosystem a good idea of where they stand, and also point them in the direction of potential actions they can take to enhance vibrancy. We have not discussed here, for example, important inputs like the educational attainment of a region's population, or the quality of entrepreneurship programs at universities, or the relationship between degree programs and entrepreneurship. Some economic research has found that generalists, or "jacks-of-all-trades," make better entrepreneurs than specialists do.²⁹ Other research has found that entrepreneurial companies tend to hire from the ranks of marginal workers—those who cannot find work at big companies or stable small businesses.³⁰

Depending on what further research finds, this will point ecosystem participants in the direction of different measurements and different actions that could be taken to link programs to entrepreneurial outcomes. Future work will focus on developing measures for specific programs and actions within an ecosystem.

Our postulates need rigorous testing at different geographic levels and across different countries—the link between entrepreneurial density and sustained job creation needs further analysis. The role of entrepreneurship in economic mobility, long an accepted theoretical relationship, also needs more

testing. And in every case, more and better data are essential. We're only just beginning, for example, to have the ability to measure the quality of jobs across different types of firms and workers.

These indicators, moreover, must not be interpreted in a vacuum—they need to be tracked across time and always need a comparison group. Even if a particular comparison between different metropolitan areas is not flattering to your particular region, it could be that the trajectory of change in the indicators shows a more positive picture. For longitudinal tracking, the time period should be long enough to capture ebbs and flows in the business cycle, but short enough to be manageable and measurable. For comparison, other metropolitan areas or regions that are comparable in size and that are geographically proximate would be the simplest way to go about it.

We invite others to propose revisions to our list, to improve the datasets that underlie these indicators (and create the necessary new datasets), and test the presumed relationships among these indicators. Questions of causality abound in these indicators, but we present this list as a starting point for measuring the health of your entrepreneurial ecosystem.

APPENDIX: POSSIBLE DATA SOURCES AND HOLES TO BE FILLED

Density—Possible Data Sources

- Population
 - Bureau of Economic Analysis (BEA)
 - *Download:* <http://www.bea.gov/regional/downloadzip.cfm>
 - *Methodology:* <http://www.bea.gov/regional/docs/msalist.cfm>
 - *Technical Notes:* We prefer this population file because metropolitan statistical areas (MSAs) change over time, but the BEA retroactively calculates population for older years with the newest MSA definitions. This comparability over time is absolutely critical.
- New and Young Businesses
 - Business Dynamics Statistics, Census Bureau
 - *Download:* http://www.census.gov/ces/dataproducts/bds/data_firm.html
 - *Methodology:* <http://www.census.gov/ces/dataproducts/bds/methodology.html>
 - *Technical Notes:* We prefer the firm tables, as opposed to the establishment tables. In the BDS, a new establishment is any physical location—for example, a new McDonald’s franchise. A new firm is a brand new legal entity, which is more closely aligned with our usual conception of a startup.
- Sectoral Density—here, because of data availability, we use high tech.
 - National Establishment Time Series (NETS)
 - *Download:* Not available for public download; must be purchased directly. More information available: <http://exceptionalgrowth.org/our-databases.iegc#NETS>
 - *Methodology:* <http://maryannfeldman.web.unc.edu/data-sources/longitudinal-databases/national-establishment-time-series-nets/>
 - *Technical Notes:* Since this is a micro-level database, it can be disaggregated by industry. In our own work, we have used the definition of high tech provided by the Bureau of Labor Statistics (BLS), which includes: Information & Communication Technologies (ICT), pharmaceutical, aerospace, engineering services, and scientific research and development sectors. Provide the exact reference.

Fluidity—Possible Data Sources

- Population Flux
 - Internal Revenue Service, Statistics of Income (SOI)
 - *Download:* <http://www.irs.gov/uac/SOI-Tax-Stats-Migration-Data-Downloads>
 - *Methodology:* <http://www.irs.gov/uac/SOI-Tax-Stats-Migration-Data>
 - *Technical Notes:* While these detailed data tables are extraordinarily useful, a much quicker and interactive look at these data can be had via the excellent Jon Bruner and the data visualization he hosts on Forbes: <http://www.forbes.com/special-report/2011/migration.html>.
- Labor Market Reallocation
 - Quarterly Workforce Indicators (QWI)
 - *Download:* <http://qwiexplorer.ces.census.gov/> and <http://lehd.ces.census.gov/data/#qwi>
 - *Methodology:* http://lehd.ces.census.gov/doc/QWI_data_notices.pdf and http://lehd.ces.census.gov/doc/QWI_101.pdf



- *Technical Notes:* One way to characterize job churning is by looking at hires minus job creation (or separations minus job destruction, which is equivalent), as a share of employment.
- High-growth Firms
 - o Inc. 5000
 - *Download:* <http://www.inc.com/inc5000/list/2014>
 - *Methodology:* <http://www.inc.com/magazine/201309/leigh-buchanan/how-the-inc.500-companies-were-selected-2013.html>
 - *Technical Notes:* Because companies self-select into these data, the Inc. 5000 is far from a random sample, discouraging comparisons across regions and provoking caution in viewing these companies as fully representative within a region.
 - o NETS also may provide a data source for high-growth firms.

Connectivity—Possible Data Sources

- This is the least developed area in terms of good indicators. Here we propose a few tools that have been used to gauge resource connectivity and the spinoff genealogy.
- Example: connectivity maps using 1 Million Cups in Kansas City
 - o *Location:* http://www.kauffman.org/~media/kauffman_org/research%20reports%20and%20covers/2014/04/1mc_think_locally_act_locally.pdf
 - The Kauffman Foundation may be able to provide a template of the underlying survey for use in your region.
 - o See also Yasuyuki Motoyama, “Examining the Connections within the Startup Ecosystem: A Case Study of St. Louis,” Kauffman Foundation, September 2014, at <http://www.kauffman.org/what-we-do/research/2014/09/examining-the-connections-within-the-startup-ecosystem-a-case-study-of-st-louis>.
- Spinoff Regions
 - o Heike Mayer
 - *Source:* <http://www.heikemayer.com/spinoff-regions.html>
 - See also: <http://siliconprairienews.com/2012/11/to-map-kc-tech-universe-professor-asks-companies-to-complete-survey/>
 - o We are exploring the use of CrunchBase for this measure, at least in an anecdotal manner.
 - A recent paper also used intra-regional LinkedIn connections to map economic growth.
 - o Michael Mandel, “Connections as a Tool for Growth: Evidence from the LinkedIn Economic Graph,” South Mountain Economics, November 2014, at <https://southmountaineconomics.files.wordpress.com/2014/11/mandel-linkedin-connections-nov2014.pdf>.

Diversity—Possible Data Sources

- Multiple Economic Specializations
 - o Quarterly Census of Employment and Wages (QCEW), Bureau of Labor Statistics
 - *Methodology:* <http://www.bls.gov/cew/cewlq.htm>
 - *Download:* http://data.bls.gov/location_quotient/ControllerServlet

- Immigration
 - o American Community Survey (ACS) (product of the Census Bureau)
 - *Download:* <http://www.census.gov/population/foreign/data/acs.html> (going through the FactFinder) or, far more easily, <http://www.migrationpolicy.org/programs/data-hub/charts/us-immigrant-population-metropolitan-area>
 - *Methodology:* http://www.census.gov/acs/www/data_documentation/documentation_main/
 - o IPUMS, Minnesota Population Center
 - *Download:* <https://usa.ipums.org/usa/>
- Income Mobility
 - o Income Tax Records assembled by Raj Chetty et al.
 - *Download:* <http://www.equality-of-opportunity.org/index.php/data>
 - *Methodology:* http://obs.rc.fas.harvard.edu/chetty/mobility_geo.pdf
 - *Technical Notes:* As with the geographic mobility data tables, there is a more easily accessible and searchable version of these data available in interactive map form, hosted at the NYT: <http://www.nytimes.com/2013/07/22/business/in-climbing-income-ladder-location-matters.html?pagewanted=all&r=2&#map-search>.

ENDNOTES

1. For a particularly striking example of the distortive effects of Campbell's Law, see Rachel Aviv, "Wrong Answer," *The New Yorker*, July 21, 2014, at <http://www.newyorker.com/magazine/2014/07/21/wrong-answer?currentPage=all>. Aviv describes it as "a principle that describes the risks of using a single indicator to measure complex social phenomena: the greater the value placed on a quantitative measure, like test scores, the more likely it is that the people using it and the process it measures will be corrupted."

2. Brad Feld, "Entrepreneurial Density," *Feld Thoughts*, August 23, 2010, at <http://www.feld.com/archives/2010/08/entrepreneurial-density.html>; Brad Feld, "Entrepreneurial Density Revisited," *Feld Thoughts*, October 3, 2011, at <http://www.feld.com/archives/2011/10/entrepreneurial-density-revisited.html>.

3. Yasuyuki Motoyama and Jordan Bell-Masterson, "Beyond Metropolitan Startup Rates: Regional Factors Associated with Startup Growth," Kauffman Foundation, January 2014, at http://www.kauffman.org/~media/kauffman_org/research%20reports%20and%20covers/2014/01/beyond_metropolitan_startup_rates.pdf.

4. See Ian Hathaway, "Tech Starts: High-Technology Business Formation and Job Creation in the United States," Kauffman Foundation, August 2013, at http://www.kauffman.org/~media/kauffman_org/research%20reports%20and%20covers/2013/08/bdstechstartsreport.pdf.

5. Depending on the availability of data and the geographic level at which these indicators are gathered (street, neighborhood, zip code, city, metro, etc.), it also should be possible to look at entrepreneurial density from a spatial perspective: for example, how many young companies are operating within a given part of the city?

6. Some measures of the rate of business creation use the population of existing businesses as the denominator, so the rate measure is (new and young firms)/(all businesses). The Kauffman Foundation has used this construction before, but unless there is a constant rate of business failure or exit, the population of existing businesses should grow over time, which is not necessarily a bad thing.



7. See, e.g., Rory McDonald, Tim Holcomb, and Martin Ganco, "Entrepreneurial Strategy," State of the Field, Kauffman Foundation, at <http://sof.kauffman.org/Entrepreneurship/Management-Organization-and-Strategy/Entrepreneurial-Strategy>.
8. AnnaLee Saxenian, *Regional Advantage: Culture and Competition in Silicon Valley and Route 128* (Harvard, 1996).
9. Paul Kedrosky, "Migration in America: Vibrant Flux," *Forbes.com*, November 16, 2011, at <http://www.forbes.com/sites/jonbruner/2011/11/16/migration-in-america-vibrant-flux/>.
10. Kate Maxwell and Samuel Arbesman, "The Ascent of America's High-Growth Companies: Founder Mobility," Kauffman Foundation, September 2012, at http://www.kauffman.org/~media/kauffman_org/research%20reports%20and%20covers/2012/09/inc_founder_mobility.pdf.
11. John Haltiwanger, Henry Hyatt, Erika McEntarfer, and Liliana Sousa, "Job Creation, Worker Churning, and Wages at Young Businesses," Kauffman Foundation, Business Dynamics Statistics Briefing, November 2012, at http://www.census.gov/ces/pdf/BDS_StatBrief7_Creation_Churning_Wages.pdf.
12. Steven J. Davis and John Haltiwanger, "Labor Market Fluidity and Economic Performance," paper presented at the Federal Reserve Bank of Kansas City's Jackson Hole symposium, August 2014. See also Alan Hyde, *Working in Silicon Valley: Economic and Legal Analysis of a High-Velocity Labor Market* (M.E. Sharpe, 2003); Kauffman Foundation, "Rethinking Non-Competes: Unlock Talent to Seed Growth," Entrepreneurship Policy Digest, July 2014, at http://www.kauffman.org/~media/kauffman_org/resources/2014/entrepreneurship%20policy%20digest%20july%202014/entrepreneurship_policy_digest_july_2014_rethinking_non_competes.pdf.
13. See, e.g., Amar Bhide, *The Origin and Evolution of New Businesses* (Oxford, 2000). See also papers by Yasuyuki Motoyama and Samuel Arbesman, on "The Ascent of America's High-Growth Companies," Kauffman Foundation, at <http://www.kauffman.org/what-we-do/research/2012/09/the-ascent-of-americas-high-growth-companies>.
14. Philip Auerswald, "Enabling Entrepreneurial Ecosystems," forthcoming in David Audretsch, Al Link, and Mary Walshok (eds.), *The Oxford Handbook of Local Competitiveness* (Oxford, 2015).
15. See Yasuyuki Motoyama, "Examining the Connections within the Startup Ecosystem: A Case Study of St. Louis," Kauffman Foundation, September 2014, at <http://www.kauffman.org/what-we-do/research/2014/09/examining-the-connections-within-the-startup-ecosystem-a-case-study-of-st-louis>.
16. This is related to Brad Feld's point that the entire spectrum of entrepreneurs should be engaged. Brad Feld, *Startup Communities: Building an Entrepreneurial Ecosystem in Your City* (Wiley, 2013).
17. See Steven Klepper, "Silicon Valley, a Chip off the Old Detroit Bloc," in Zoltan Acs, David Audretsch, and Robert Strom (eds.), *Entrepreneurship, Growth, and Public Policy* (Cambridge, 2009).
18. Toby E. Stuart and Olav Sorenson, "Liquidity Events and the Geographic Distribution of Entrepreneurial Activity," *Administrative Science Quarterly*, June 2003.
19. Heike Mayer, *Entrepreneurship and Innovation in Second Tier Regions* (Elgar, 2011). See also <http://www.heikemayer.com/spinoff-regions.html>.
20. It also has been called "entrepreneurial spawning" in the research literature, but we prefer something more generic. See Paul Gompers, Josh Lerner, and David Scharfstein, "Entrepreneurial Spawning: Public Corporations and the Genesis of New Ventures, 1986 to 1999," *Journal of Finance*, April 2005.

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21. We should point out that this is not equivalent to the idea of an “anchor firm,” a large company that dominates a local economy and is a source of not only jobs but also civic largesse. While existing companies and organizations are, in vibrant ecosystems, progenitors of new entrepreneurs and companies, anchor firms often can induce economic stagnation.
22. Maryann Feldman and Ted D. Zoller, “Dealmakers in Place: Social Capital Connections in Regional Entrepreneurial Economies,” *Regional Studies*, January 2012.
23. Cesar A. Hidalgo and Ricardo Hausmann, “The Building Blocks of Economic Complexity,” *Proceedings of the National Academy of Sciences* (June 2009).
24. We are indebted to Emil Malizia for crystallizing this point for us, and working out the diversity/specialization/multiple specialization idea. Degrees of specialization within a particular geographic area also will be related to the spinoff rate and the presence of dominant firms.
25. Essentially, a measure of specialization in a given sector, in a given geographic area, as compared to a larger encompassing region. See Appendix for more detail.
26. Kauffman Index of Entrepreneurial Activity, at <http://www.kauffman.org/what-we-do/research/kauffman-index-of-entrepreneurial-activity>.
27. For a look at the aggregate relationship between employee age and company age, see Paige Ouimet and Rebecca Zarutskie, “Who Works for Startups? The Relation Between Firm Age, Employee Age, and Growth,” Federal Reserve Board, Working Paper, Finance and Economics Discussion Series, 2013, at <http://www.federalreserve.gov/pubs/feds/2013/201375/201375pap.pdf>.
28. See, e.g., Ryan Avent, *The Gated City* (Kindle Single, 2011); Matthew Yglesias, *The Rent is Too Damn High* (Kindle Single, 2012). See also Emil Malizia and Yasuyuki Motoyama, “The Economic Development—Vibrant Center Connection: Tracking High-Growth Firms in the D.C. Region,” (under review).
29. Edward P. Lazear, “Entrepreneurship,” *Journal of Labor Economics* (2005).
30. Amar Bhidé, *The Origin and Evolution of New Businesses* (Oxford, 2000).

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