The Status of Entrepreneurs in Kansas City, Mo: Exploring the Quarterly Census of Employers and Wages.

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Introduction

The recent persistence of wage stagnation, high unemployment, and low growth has policymakers looking for new ways to stimulate the economy. Many leaders have turned towards entrepreneurship as a potential source of light in dark times. A crucial component of achieving this, or any, goal is an accurate measurement of indicators. Economic theory, beginning with Schumpeter, that places the entrepreneur as an integral economic agent provides critical theoretical support to these plans. Recent empirical research has also found entrepreneurial firms to be important contributors of jobs, and startup activity has been shown to have a positive relationship with economic growth. This paper first describes the existing theoretical framework and research of the role of entrepreneurship plays in the economy, and then sets out on to describe the status of Kansas City entrepreneurial economy using the exhaustive data in the Quarterly Census of Employers and Wages (QCEW). The QCEW dataset contains records for every employer and worker, and can be explored to generate measurements of an entrepreneurial ecosystem. The status of Kansas City startups will be measured by generating statistics that represent key components of the local economy. First, the number of startups in a period provides information on the level of entrepreneurial activity. The number of startups is broken down by industry and indexed to identify sectors with more entrepreneurial activity than others. Second, since new companies are important job creators in a growing economy, the amount of jobs contributed by startups at birth and over their lives is examined. Third, since wages are the key drivers of the economic development that policy makers are targeting, wage growth patterns are examined. Finally, the survival rate of firms in Kansas City is calculated. Finally, survival rates are broken down by industry for comparison. New firms are the transition mechanism between technological advance and production, but without the death of sluggish firms that source of innovation would be stifled.

The goal of the exploratory analysis is to identify trends for Kansas City startups. Where are jobs, innovation, and economic benefits in Kansas City, Mo? Patterns or unique findings will identify potential questions for future research. Connecting the data from Kansas City with the existing theory pertaining to entrepreneurship is a positive step in supporting politicians in their quest to boost the economic prosperity.

Entrepreneur in Economic Theory

Economic theory often ignores the entrepreneur's role as the human connection between technological innovation and the production process. Production functions used to describe the distribution of income between capital and labor take the level of activity, the technique, and employment as exogenously determined. Ignoring the means by which technological advance enters into the production process limits the usefulness of economic models for growth and development. Entrepreneurship started receiving academic attention in the late 1980s as evidence began to demonstrate an important place for small new firms. Low (2001) discusses a growing interest in the topic as a response to macroeconomic trends, and argues that the variety of topics represents a strength of the field. Shane and Venkataraman (2000), on the other hand, argue that the large variety of topics is a weakness, and focusing the field on a finite paradigm would produce more productive research by entrepreneurial researchers and encourage interdisciplinary collaboration. Jones et. al.'s (2011) literature review describes a wide diversity of research theory and methodology, but the diversity exhibits an evolutionary convergence is taking place. Their conclusion is that potential rich intellectual territory exists for future research.

Keynes famously recognized the importance of the entrepreneur in 1936, but his analysis restricted itself to the decision to invest. It is the Schumpeterian (1912) innovation process that argues development originates from entrepreneurs acting on perceived market opportunities and seeking credit to facilitate investment. The use of credit acts to redistribute capital from old, less efficient firms to new innovative startups. The role of the entrepreneur was further advanced by Baumol (1968). His argument was that "It is [the entrepreneur's] job to locate new ideas and to put them into effect. He must lead, perhaps even inspire; he cannot allow things to get into a rut and for him today's practice is never good enough for tomorrow." (Baumol, 65) Baumol's description of the entrepreneur was a theory of endogenous growth at a time when inherited models ignored the entrepreneurial function by taking the level of output as exogenous. Capital and labor distribution do not adequately account for output growth of early 20th-century productivity growth.

Recent developments have been made in formalizing the endogenous growth model. Wong et. al. (2005) model technological growth as the result of decisions made by profit-maximizing agents. Endogenous growth comes from the entrepreneur acting within the economic system, rather than starting with a technique being bestowed upon firms from above. Wong et. al. contributed to the literature using GEM data to empirically demonstrate the validity of entrepreneurs' role in economic development. Entrepreneurship as a realm of investigation is a relatively recent event, but incorporating the entrepreneur into formal theoretical models provides economists a framework for empirical research.

Early evidence for the importance of the entrepreneur came in David L. Birch's work that showed small businesses are the source of net new jobs in the American economy. Birch's 1981 finding showed that half of all jobs and firms must be replaced every five years for the economy to "break-even,", which illustrates the necessity of job creators. Birch (1987) found that firms with 1-19 employees created 88 percent of net new jobs during the period from 1981-1985, which Birch argues more than offsets the high failure rate among small firms. In an almost side note, Birch mentions that a majority of the net new jobs from small firms are created by firms less than four years old, leading Birch to conclude "the job creators are the relatively few younger ones that start up and expand rapidly in their youth, outgrowing the "small" designation in the process." This early auxiliary finding has remained relevant in recent work. Haltiwanger, Jarmin, and Miranda (2013) continue the attention on new firms using the Census Bureau's Longitudinal Business Database by. The authors find that it is not just young firms, but young firms with above average growth that add most to net new jobs. The evidence is growing that young, entrepreneurial firms are economic engines through the job generation process. The evidence for relevance to economic growth is equally supportive.

In recent history, US employment trends have shifted away from large firms (500+ employees). In 1970 these firms accounted for twenty percent of employment, but by 1996 they only accounted for 8.6 percent. (Carree and Thurik, 2003) This structural shift is evidence for the importance of entrepreneurial activity to economic growth. Entrepreneurial activity has demonstrated a relationship with growth at all geographic levels. Audretsch et. al. (2015) find positive growth at the city level attributable to both direct (effects from founding) and indirect effects (effects from new firms becoming established). Hafer (2013) and Robinns et. al. (2000) both find that small business has an impact on economic activity at the state level. Van Stel et. al. (2005) identify a positive impact for developed nations. The empirical support provided by these studies support the Schumpeterian Entrepreneur as an innovator.

A difficulty in researching entrepreneurship is created by the unspecific nature of the word "entrepreneur". For Schumpeter, the entrepreneur was the early mover who invested in new opportunities. Carland et. al. (1988) state that entrepreneurship is a dynamic activity, so the entrepreneur is best defined by what they do. They argue research on the entrepreneur will be studying the activity of an Innovator, a Risk Taker, a Resource Coordinator, Founder, a Doer/Undertaker, or someone who recognizes opportunities. For the Acs et. al.'s (2009) endogenous model, the entrepreneur is the agent that exploits knowledge spillover from incumbents. Entrepreneurial activity, in part, determines the level of investments in new knowledge. This paper defines entrepreneur based on the applicability to the dataset. The QCEW uses unemployment insurance records, so new firms will be identified as entrepreneurial.

The role of the entrepreneur in economic development has strong support in the economic literature. The agents of change are best defined by what they do, which is fitting for economic models that include them as the transmission mechanism. Entrepreneurial activity has shown a positive relationship with economic growth. New firms are necessary for replacing the jobs shed by older unresponsive firms. The evidence from the national, state, and local level supports entrepreneurs as innovators. Economic theory must include, at the very least, the role of an entrepreneur in their models. Not an easy empirical task, but with access to increasingly better datasets inclusion of entrepreneurs may be more possible. Since entrepreneurs are crucial to the economy, an important first step in researching their economic contributions is exploring the data.

The Role of the Entrepreneur in Kansas City

Kansas City has identified startups as an important source of new job creation and economic growth in setting their goal to become the most entrepreneurial city in America. In an effort to understand how entrepreneurs currently fit into the local economy, this paper performs exploratory analysis with one of the most comprehensive employment data sets in existence. The Quarterly Census of Employment and Wages (QCEW) has been used in previous studies to understand entrepreneurship in the job generation process. Spletzer (2000) uses quarterly UI microdata to overcome data limitations seen in previous studies that typically rely on manufacturing survey data. State laws requiring employers to report quarterly Unemployment Insurance (UI) contributions provides records that result in a large, exhaustively inclusive, high-frequency database. Spletzer prefers the QCEW for it's ability to accurately identify firm birth and deaths. Spletzer's key findings is that firm birth and death are the primary source creating and destroying jobs.

A benefit of the QCEW is that the longitudinal records enable researchers to ask very specific questions of the data. For example, Ferree and Smith (2013) mine the QCEW to track employment and wage changes due to the recent oil boom in South Dakota. Dolfman et. al. (2007) use the QCEW to measure the economic impact of Hurricane Katrina on New Orleans. The QCEW has an ability to track individuals within industries or by activities as demonstrated by Salamon and Sokolowski (2005) in their work focused on Non-Profit firms. This report follows in the footsteps of these papers to create a picture of the status of entrepreneurs in Kansas City.

Data

This report uses Quarterly Census of Employment and Wages (QCEW) data from the Bureau of Labor Statistics (BLS), which is collected by the State Employment Security Agencies (SESAs).

Employment and Wage information are collected for workers covered by unemployment insurance (UI) laws and by the Unemployment Compensation for Federal Employees (UCFE) program.[1] The QCEW database consists of two files. The Employer file contains records of firm location. The Wage file contains records of employee wages. Entries in the files are matched by an Unemployment Insurance Identification Number (UiN). The Employer database is the primary source used for this report, with the wage file used for calculation of quantity employment and wage variables. The number of employees is calculated by the number of employee records filed under a UiN in a period. Average wages are mean wages reported under each UiN in the wage file. The Missouri Employer database consists of 6898958 observations over the years 2005 through 2015 and 290871 firms.

Kansas City straddles the border between Kansas and Missouri. This report will include only records for Kansas City, Mo because of the method used for recording firm identifiers in the Missouri QCEW. In the Missouri QCEW Employer file, firms are identified by UiN for firms, which includes all establishments organized as a part of that firm. Also included is a RuN for individual establishment locations. The Missouri QCEW Wage file identifies employees only by UiN. This identification process prevents users from differentiating between employees in St. Louis or Kansas City working for one firm. On the other hand, this method for identification does allow the ability to distinguish between establishment and firm. A truly new firm can then be identified by firms who report paying employees for the first time with only one location. These first-time reporters closely fit the theoretical definition of an entrepreneur. Some firms demonstrate seasonal activity when they report employment one quarter but not in following quarters, and then report again in later quarters. To account for this intermittent activity in the identification of newness, the report identifies birth using the full dataset, and then subsets for firms born since the year 2009. The subset limits error because only identifiers that do not appear in the first four years of the data will be recognized as births. Because the reporting process is unique to Missouri, the method for identifying startups can only be done for Kansas City, Mo (KCMO). The Kansas files record a unique UiN for individual establishments, which makes distinguishing between firm and establishment impossible. The resulting data used in this report includes 137031 observations of 15916 firms over the years 2009 through 2015. The geographical area used is MARC county definition of the Kansas City metro, including: Cass, Clay, Jackson, Platte, Ray.

Number of Startups

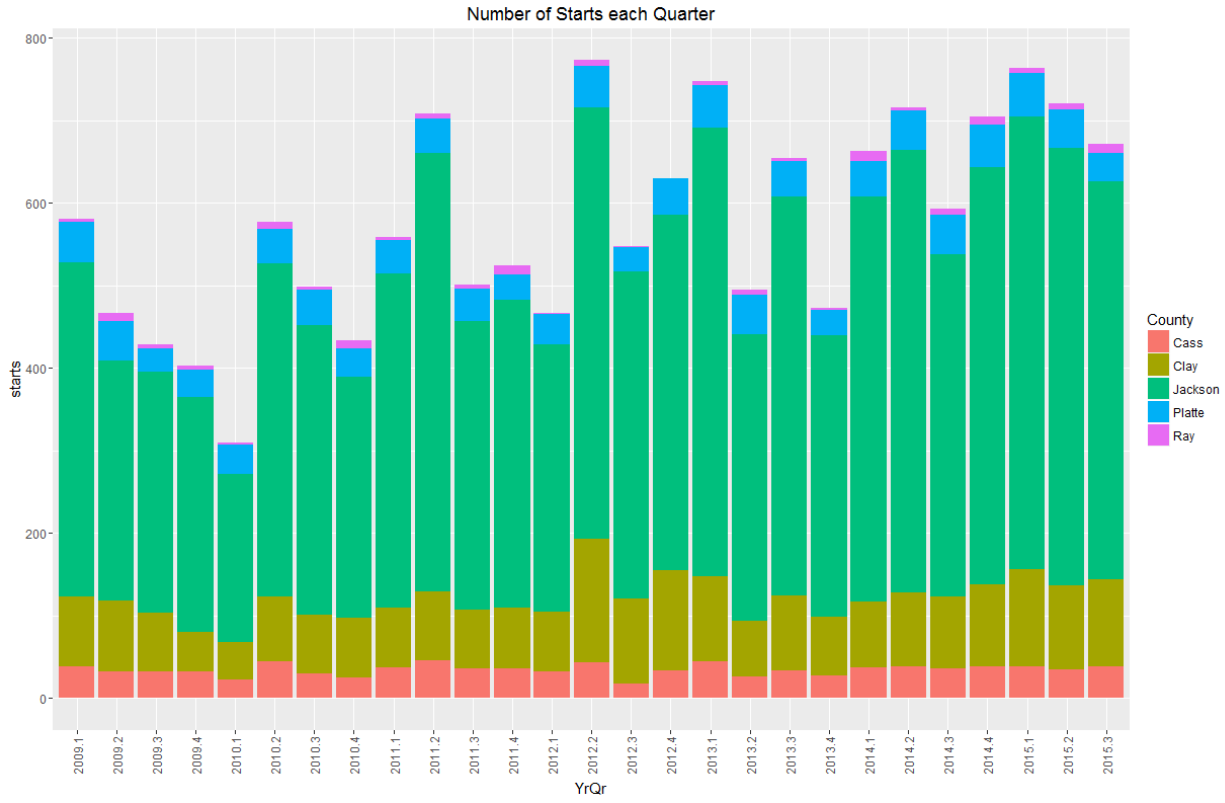
The above theory suggests that a healthy quantity of startups is crucial to economic development. This first section reviews the number of startups by period. Figure 1 shows that an overwhelming majority of new firms are in Jackson County, with proportions remaining relatively constant through the recovery after the recession. This is expected as the metropolitan core is entirely located within Jackson county. The level of startups reflected in the quarterly data demonstrates a seasonality to when firms hire a first employee. Excluding the downward trend at the end of the recession, the second quarter most often has the highest number of new employer firms each year and the fourth quarter most often has the fewest number of startups.

Figure 2 is the same data as Figure one, but is here categorized by an industrial breakdown of startups in each industry per quarter. The effects of the recession that officially ran from late 2008 to late 2010 are observed in the startup activity. The lowest number of startups are seen in the first

[1] http://www.bls.gov/cew/cewover.htm

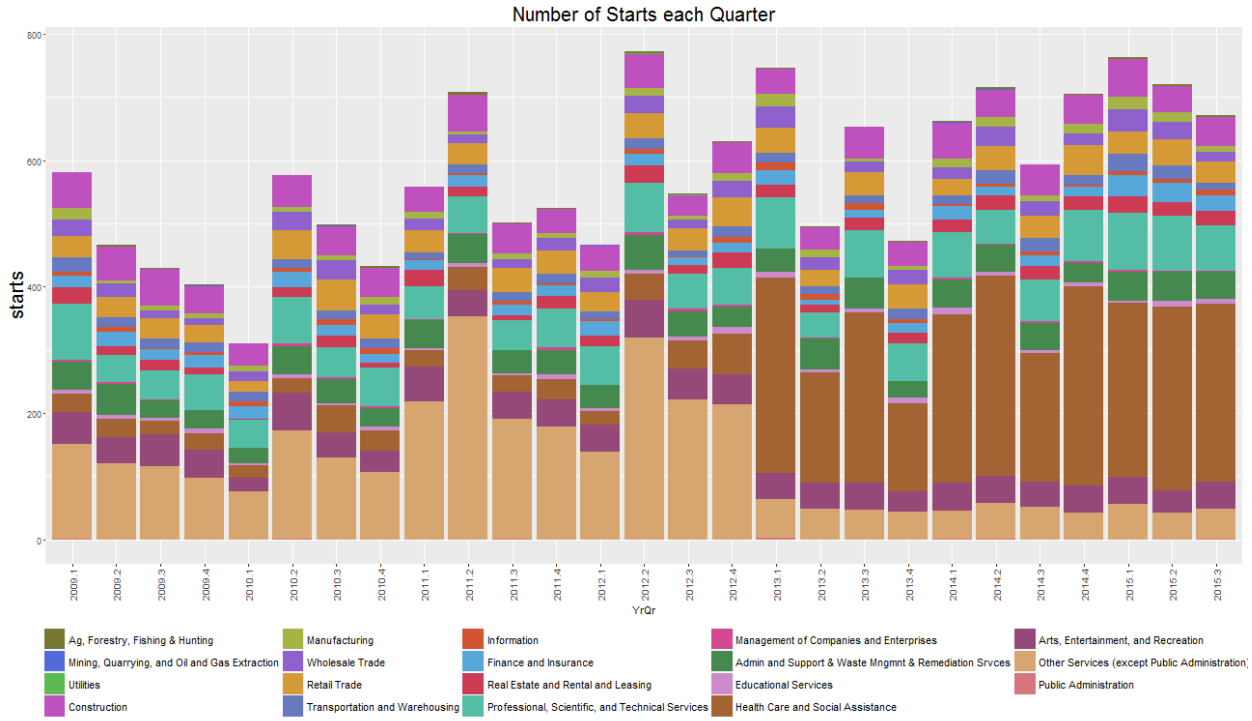
quarter of 2010. Another industrial characteristic is the large increase in the share of startups in the healthcare industries after 2012. This is due in part to a re-categorization of the NAICS firms are assigned. A large group of firms before 2012 are identified as Other Services, but, are now considered as a part of the healthcare industries.[2] Aside from this change in record keeping, we see the relatively constant industrial composition. The number of Professional, Scientific and Technical startups is maintained through the recession, while other industries see considerable declines. The relative stability of these industries may be influencing the current push towards STEM education. As of 2015 Healthcare and Professional, Scientific and Technical, Administrative, and Construction industries represented the highest number of startups.

Figure 1



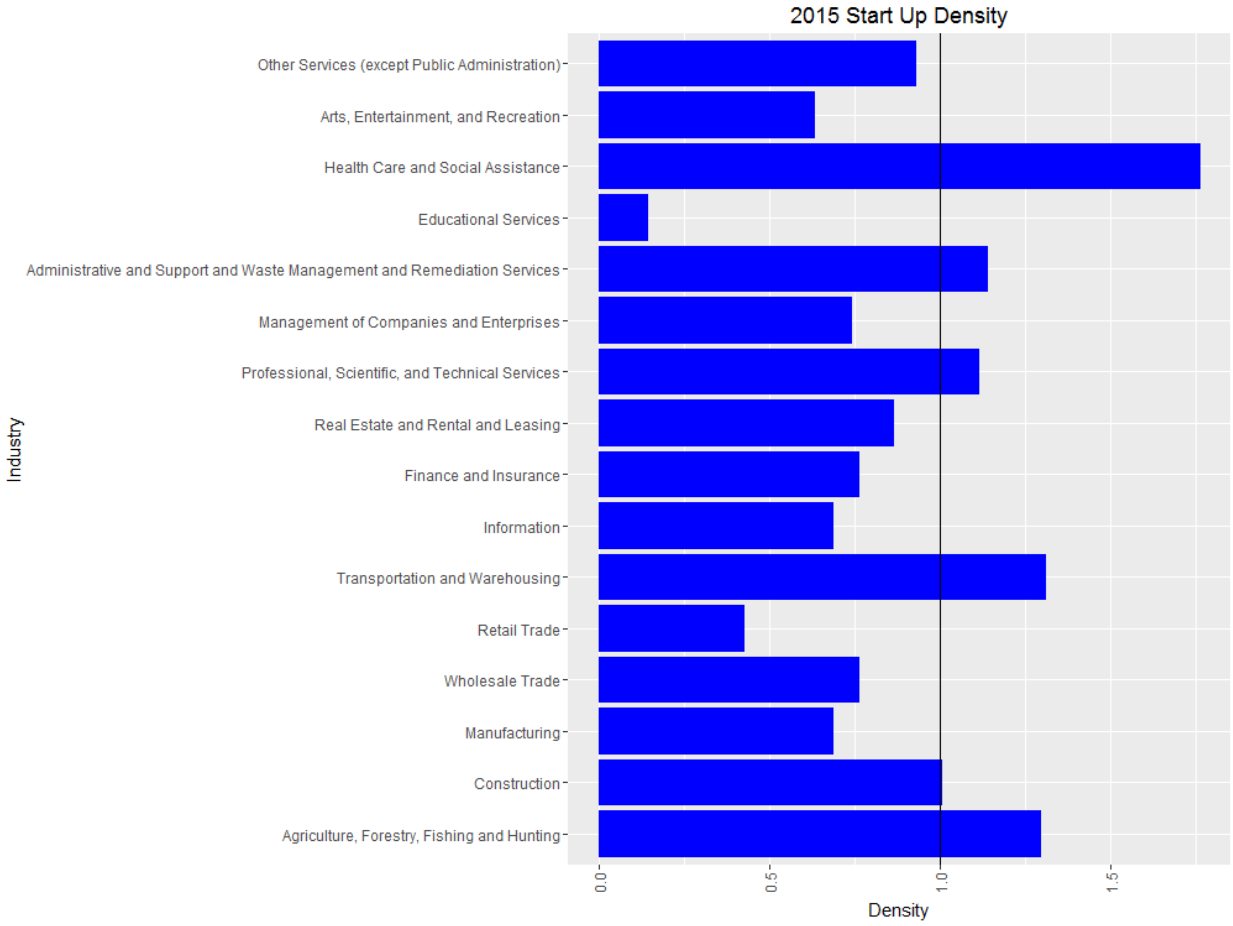
[2] This is assumed, large number of continuing firms switch their NAICS code in that year.

Figure 2



The next section addresses industrial startup activity. Knowledge spillover means that new firms are active and taking advantage of the experience of established players. One way to measure startup activity within an industry is to compare the number of new firms to the total number of firms in an industry with a Startup Density Index (SDI). SDI is the number of startup firms as a share of the industry as a whole normalized by the startup metro density. A high SDI industry means that that industry is experiencing a firm growth. Here we observe the Health Care and Social Assistance has the highest startup density index with Administrative and Support and Waste Management and Remediation Services; Professional, Scientific and Technical Services; Transportation and Warehousing; Construction; and Agriculture, Forestry, Fishing and Hunting all above the regional average in 2015. Education Services has the lowest startup density, which is expected given the industrial organization of the educational system.

Figure 3



Employment

The definition of a startup using the QCEW data identifies firms who are reporting employees for the first time, but the number of the employees hired in the initial period varies between industries. These newly created jobs from Startups are the important net new jobs that replace lost jobs. Figure 4 demonstrates Startups in the Management and Enterprises sector and companies in Manufacturing have the largest number of hires in their first quarter. Surprisingly though, the typically labor intensive industries, utilities and mining, have the lowest number of hires in their first period. Both these industries observed fewer than five startup firms in the dataset, so they are unlikely to represent typical operations.

Figure 4

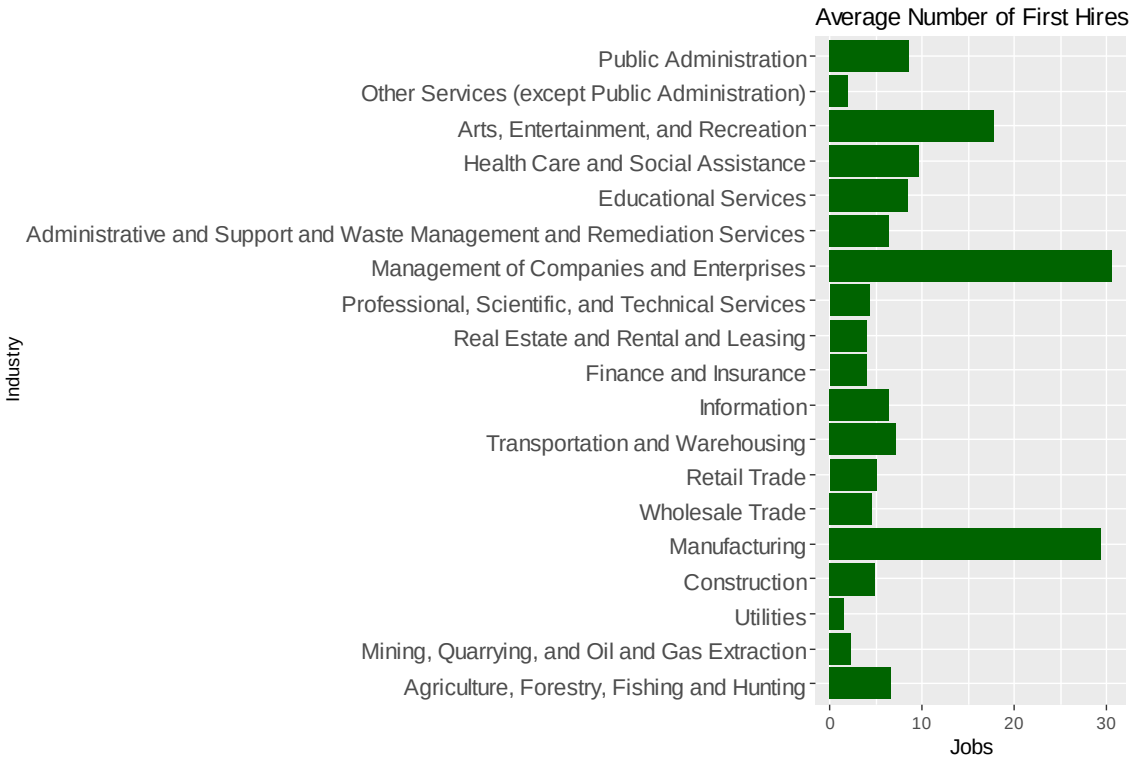
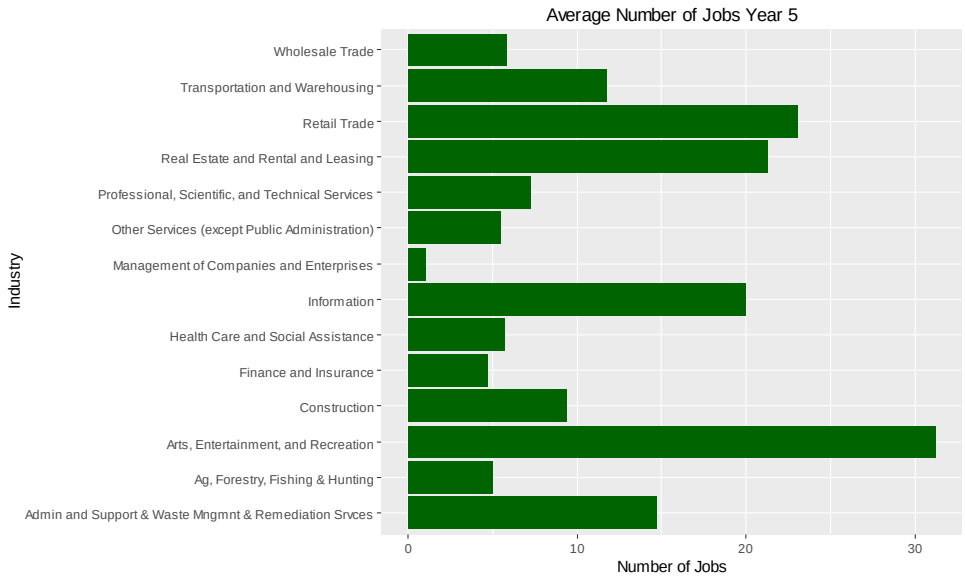


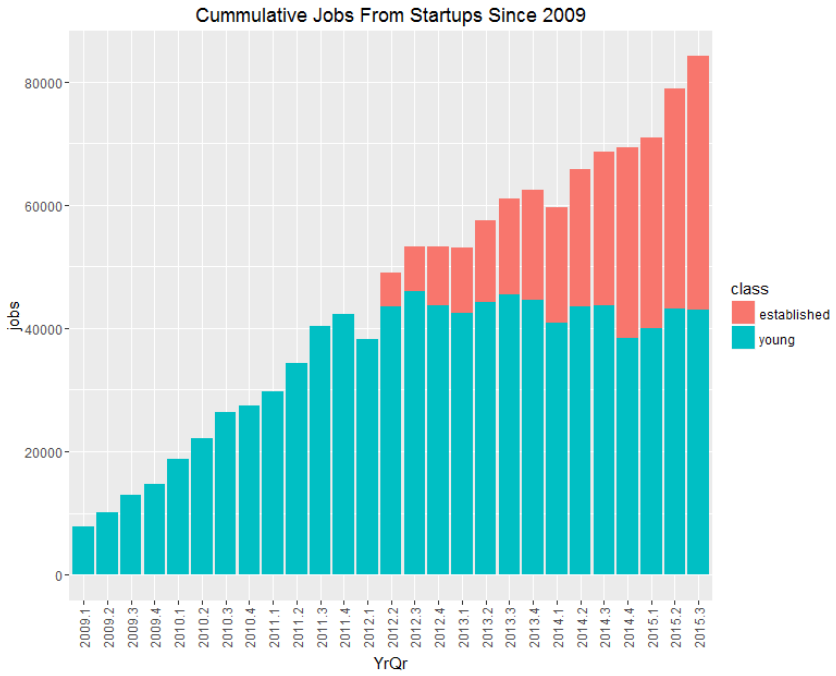
Figure 5 is the average number of jobs contributed by a firm within a specific industry once reaching the age of five years. Startups that reach this age can be considered established within their respective market. (The fact that most firms drop out by five years is shown below) Startups are a source of net new jobs as the job creation offsets job destruction from firm failure.

Figure 5



We see the effect of net job contribution in Figure 6. Figure 6 marks established firms as those older than three years. At the three-year mark, consistent job creation is coming from young firms. It is also shown that net jobs from earlier cohorts continue to add jobs after they reach the three-year mark. This finding supports the Birch finding that most net new jobs come from firms younger than four years old.

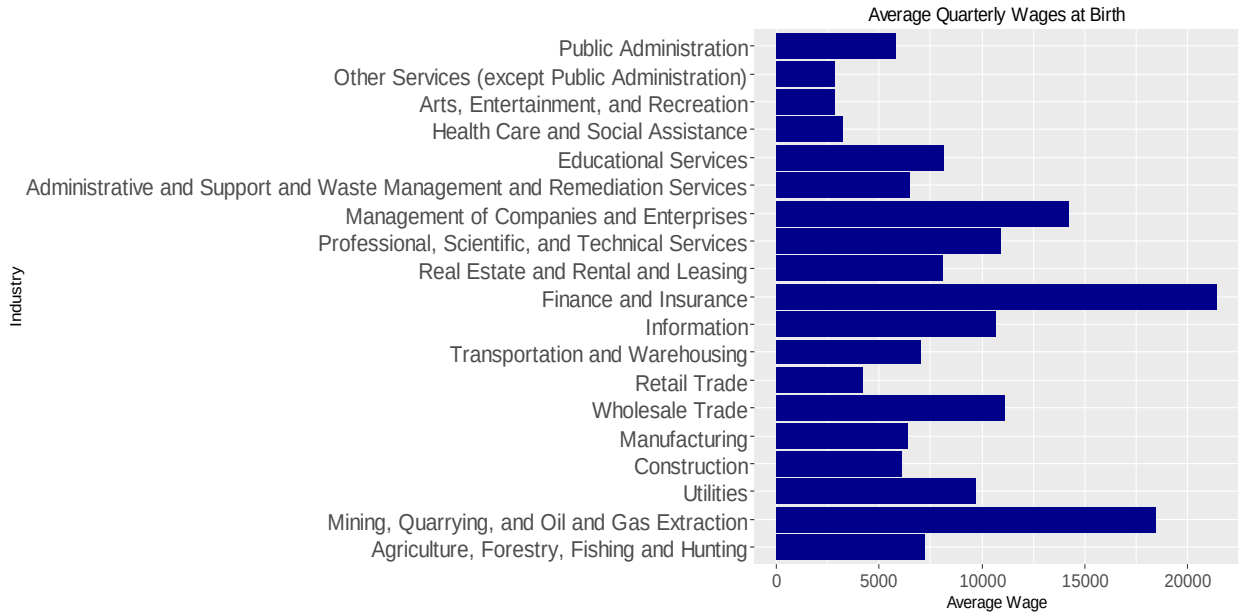
Figure 6



Wages

Wages are where the investment in an entrepreneurial economy becomes a driver of economic growth. Wages paid to new employees filter out into the larger economy when workers buy goods and generate revenue. Figure 7 shows the potential for immediate impact with average wages at startup birth. We see that Finance and Insurance have high wages at birth, with Information; Management of Companies and Enterprises; and Retail Trade all paying high wages at birth.

Figure 7



Wages at birth compared to wages after can shed light on the entrepreneurial business model employed in Kansas City. If wages start low, but then rise it could indicate that new firms are making attempts at cost cutting to increase market share. On the other hand, constant wages over lifecycle would suggest that wages are market determined with no room for growth. Figure 8 displays average industry wages after birth. Wild fluctuations and high growth are observed in the Management Industry, but the overall trend is low steady growth. This finding suggests that entrepreneurial strategies for business growth are likely centered around a perceived market opportunity. Entrepreneurs enter the market with lower, but competitive wages, and then increase wages as firms become established. Tiers are observed in the wages for startup firms. Management firms are sitting above the rest. Information industry sits near the top of a lower wage cluster, which would include young tech companies. A middle cluster of well-paying jobs is observed for Finance and Insurance, Professional, Scientific, and Technical Services, and wholesale trade.

When considering the overall wage trend of startups verse established firms we notice that new entrepreneurial firms pay less than the metro average at birth, but eventually move towards and surpass the average. Figure nine shows the average wage of firms at a given age. As firms age, inefficient operations drop out, they are able to take advantage of innovation. In turn wages can rise and eventually pass the metro average wage (indicated by blue line). This wage growth is encouraging for Kansas City entrepreneurs and workers. Successful firms have the potential to increase wages and contribute to economic growth.

Figure 8

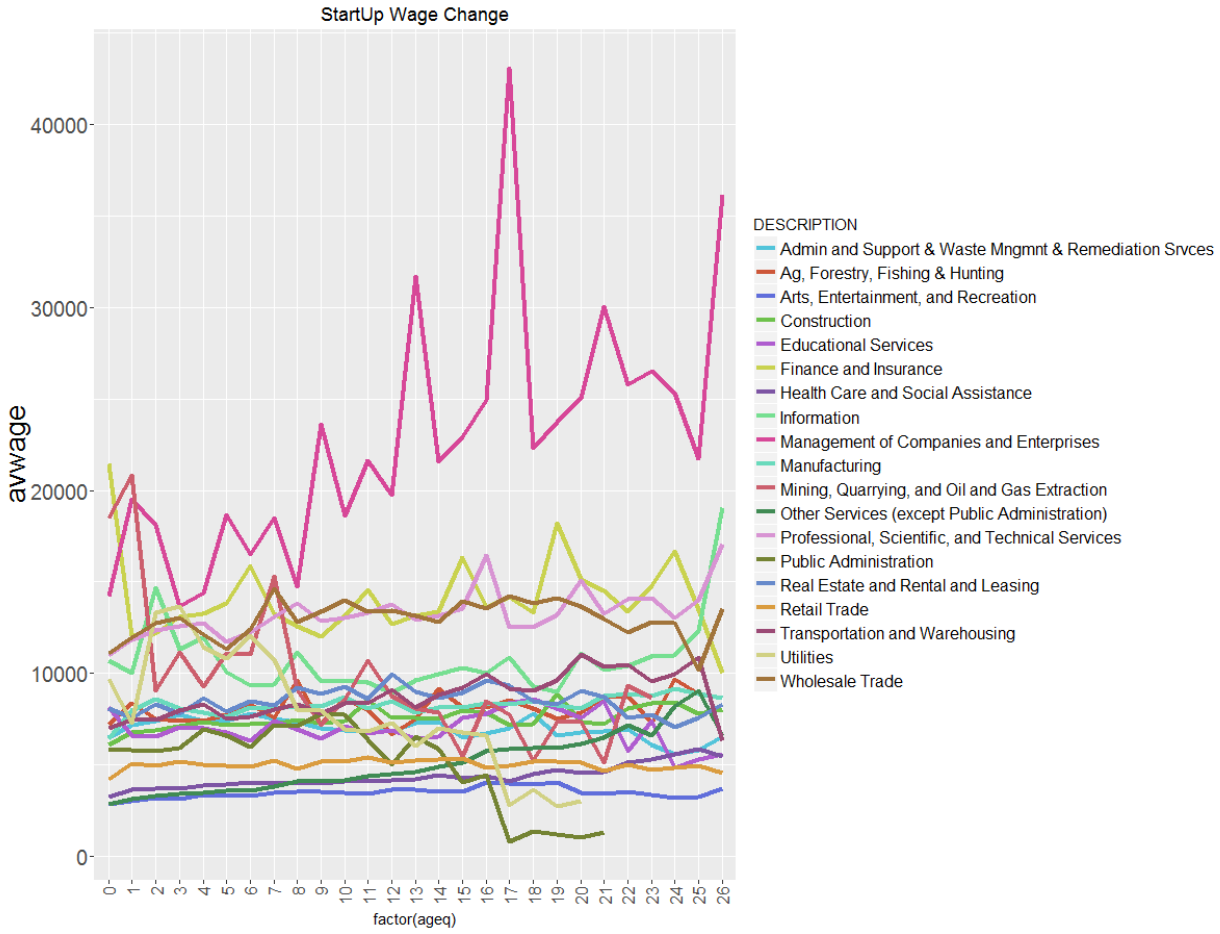
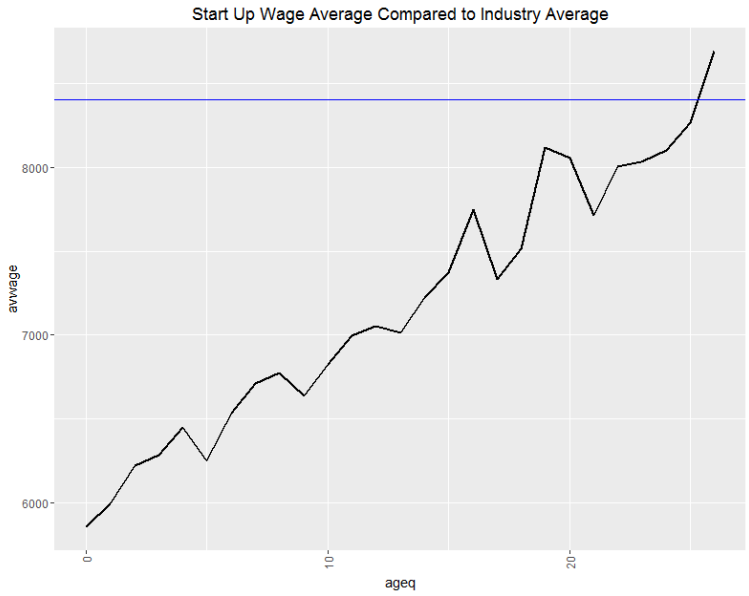


Figure 9

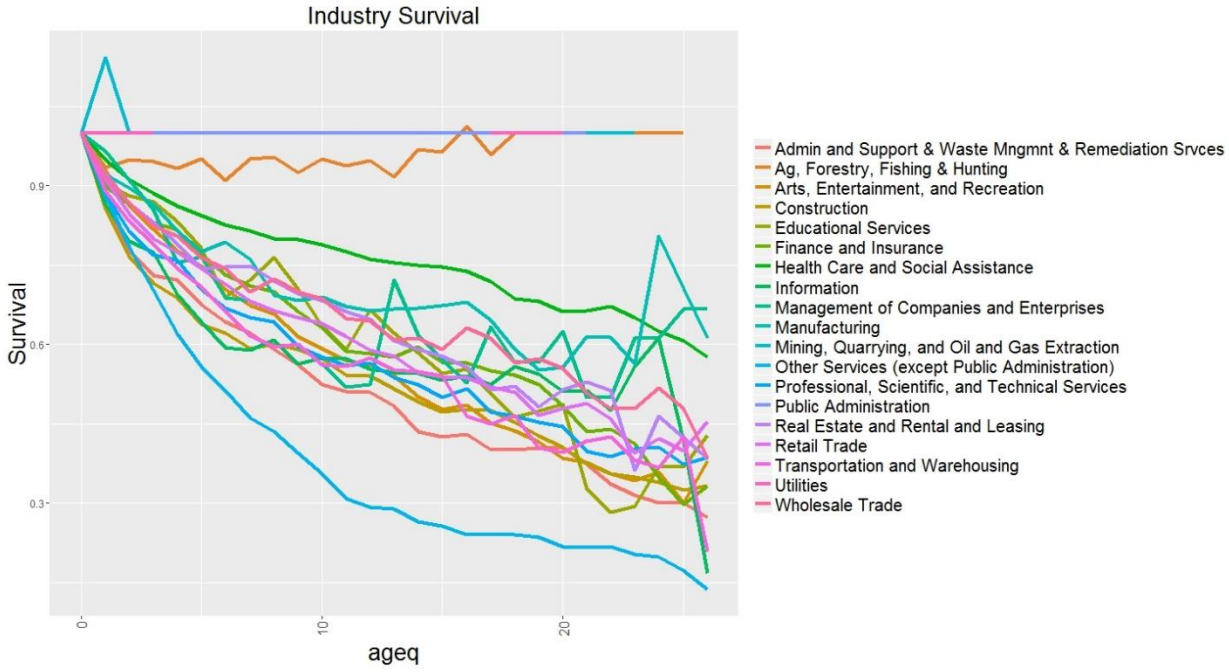


Survival

An important consideration in entrepreneurial environment is the probability of survival. A healthy economy should foster new firms with an opportunity at success. For endogenous growth theory, though, it would be counter-productive to allow firms that are not innovating on existing methods to survive for too long. Figure 10 shows the separate the survival rates of Kansas City industries. The survival rate is calculated by the number of firms that exist in a birth cohort in a given period divided by the number that began in the cohort. For example, the number of firms in healthcare in quarter 12 divided by the number of firms in quarter 0. The total industry survival rate is simply the average survival rate for each quarter since birth.

The high survival rates of Agg. Forestry, Fishing & Hunting, Mining and Utilities stand out, but these are outlier industries with less than five observations for each. Their high survival rate can be considered unrepresentative due to the fact that few firms enter and exit. Below in the main cluster of survival the other industries are more comparable each other. Healthcare[3] industries clearly show a higher survival rate than all other firms, and Other Services is much lower.

Figure 10

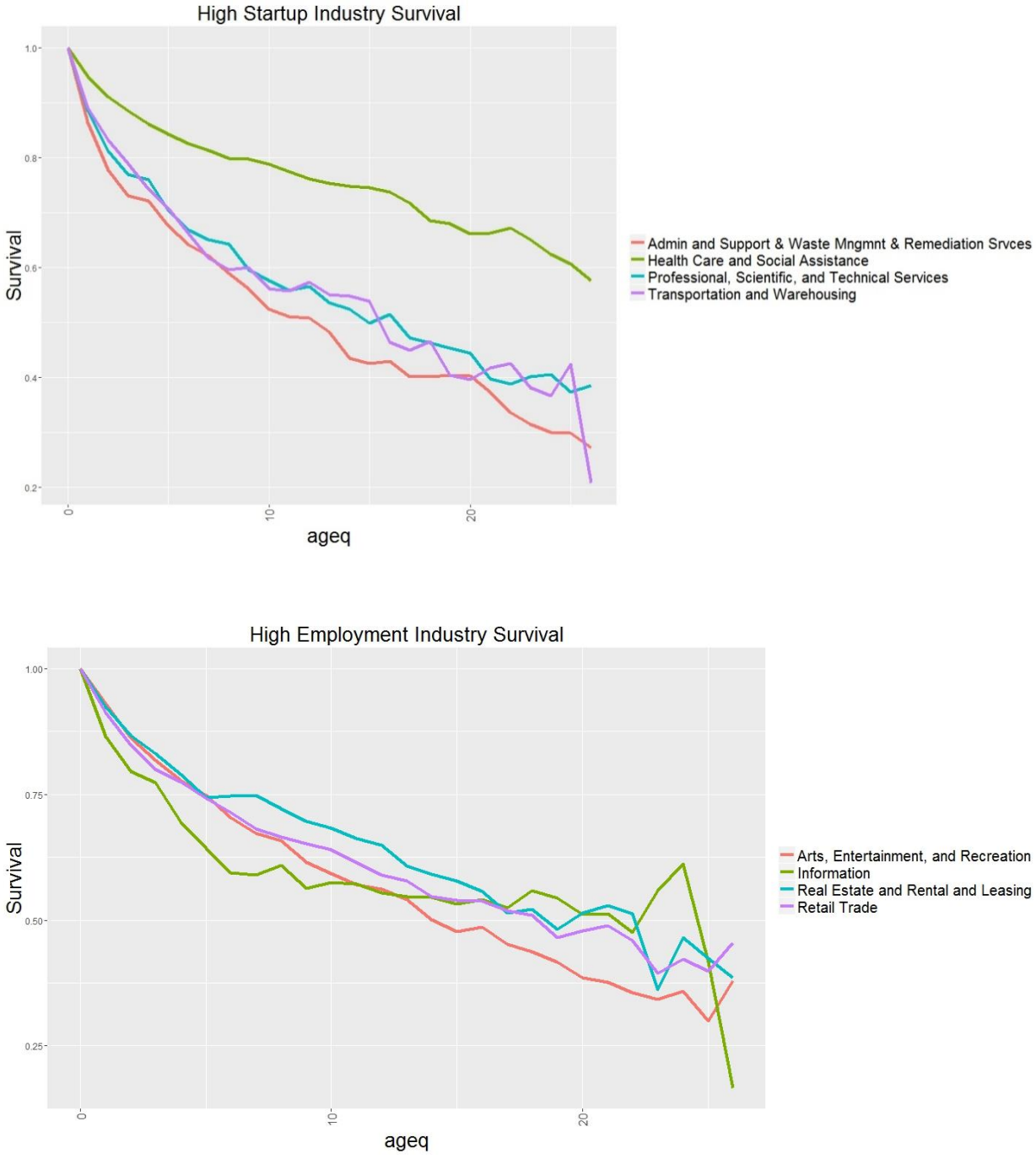


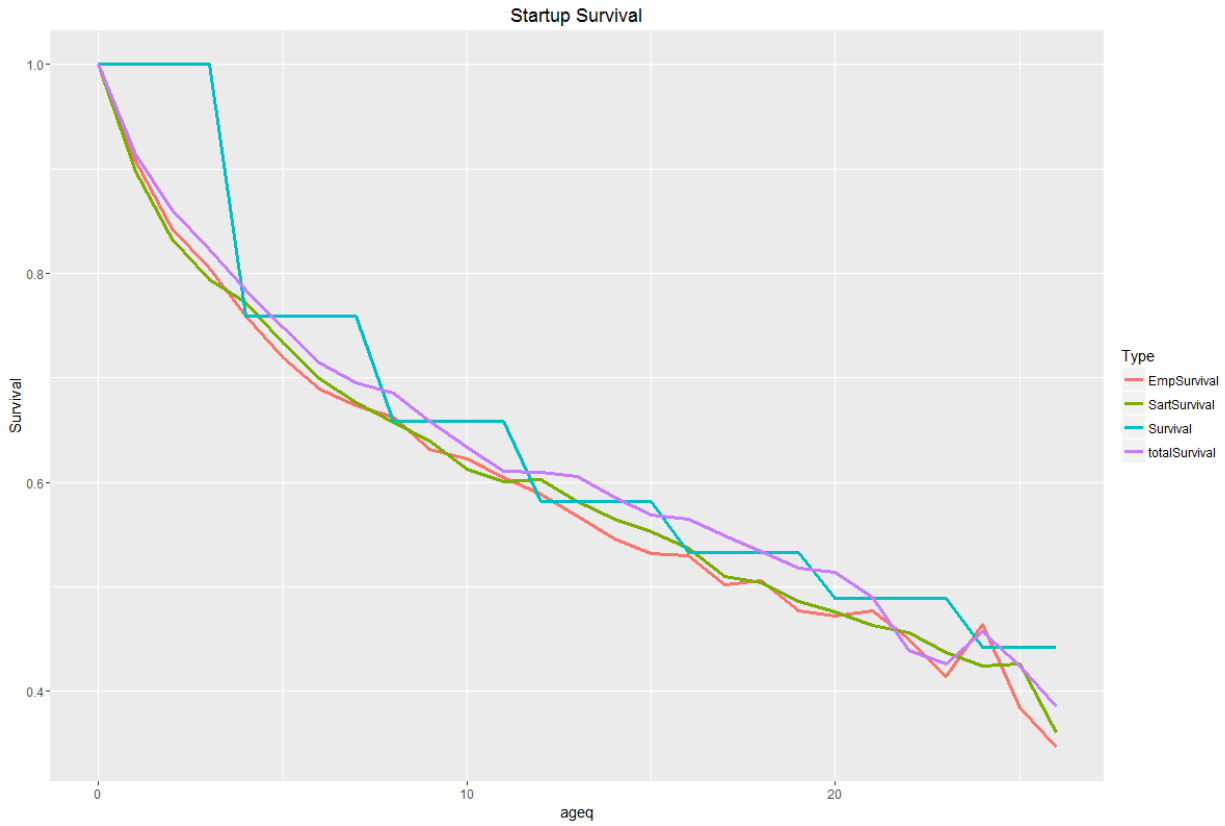
To further analyze the economic process of startups in the metro economy, the survival rate of high job creators and high startup firms are separated out. Figure 11 shows the four industries with the highest startup index. Agriculture has been excluded. We see again that Health Care is unique even compared to these other firms. Figure 12 shows the industries with the highest average number of employees after five years. They all observe a similar pattern to each other. The final survival plot compares the high startup industries to the high employment industries against the metro average and the national average. The national average takes on the stepwise fashion because it is drawn from yearly BLS data

[3] In consideration of the switch in industry identification that takes place in 2011.1 all firms that exit or finish the time series as health care have been recoded into health care for their entire lifespan.

rather than QCEW quarterly data. Metro area survival is right in line with the national average, and the high entrepreneurial industries remain a slightly below. The fact that the entrepreneurial industries experience lower survival than metro or national averages may not be considered a negative. Above average startup density and below average survival could signify a higher churn and greater opportunity for knowledge spillover and innovation.

Figure 11





Discussion

One clear trend that emerges from the exploratory analysis is the healthcare industry the strongest source of entrepreneurial activity in Kansas City. Healthcare observes a high startup index, steady job contributions, decent wages, and above average firm survival. Other industries of note in Kansas City are the Financial services and Managerial services. Both industries provide high wages for new firms and Management Service firms are large job contributors from birth. Kansas City as a whole can be considered to have strong entrepreneurial activity. Steady births of new firms are observed in all quarters, with a solid recovery appearing after the 2007-8 recession. The status of entrepreneurship indicators are dominated by Health Care services, but beyond that there is a strong variety of new firms in each period. A mix of firms benefits an entrepreneurial city with the increased potential for knowledge spillover between industries. Most important is the solid contributions of jobs by new firms. Kansas City observes a steady growth of jobs contributed as firms age. These findings support Birch's argument that the job growth outweighs the cost of high death rates. The wage growth among firms provides evidence that startups contribute economic growth to Kansas City. The survival times of Kansas City firms are consistent with national averages, which means there is no evidence of firms are being stifled or coddled at birth.

The QCEW startup data is also consistent with Schumpeterian Innovation and Endogenous growth models. The steady rate of new firms, job contributions, and lifetime wage growth suggests that these new firms are playing an important role in the Kansas City, Mo economy. High job contributions despite firm mortality suggest that the startups are acting as innovative entrepreneurs and providing real growth. Wage growth suggests that these firms are entering at a perceived market opportunity.

Initial findings suggest that the emphasis on entrepreneurship in KCMO's economic development strategy could be rewarded, but further research is needed.

The purpose of this type of exploratory analysis is to identify trends that may hold potential information. Future lines of research could include investigations into the healthcare industry in Kansas City. Is this industry something unique locally or is its growth part of a national growth in health care services? Another line of inquiry would be to measure the diversity of startups each period and ask how important industrial composition is of the economic impact of an area. The wage question is of concern to Kansas City and could generate many lines of inquiry. How do workers move in and out of these firms? What is the influence of low startup wages on the economy as a whole, and is this a national or local pattern? These questions would require national data sets for comparison.

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