Household Inequality, Entrepreneurial Dynamism and Corporate Financing

Fabio Braggion
CentER - Tilburg University

Department of Finance
PO Box 90153, NL 5000 LE Tilburg, The Netherlands
E-mail: f.braggion@uvt.nl

Mintra Dwarkasing
Erasmus University Rotterdam

Department of Business Economics
Erasmus School of Economics, Business Economics
Burgemeester Oudlaan 50, PO Box 1738, 3000 DR Rotterdam, The Netherlands
E-mail: dwarkasing@ese.eur.nl

Steven Ongena *
University of Zürich, *Swiss Finance Institute*, *KU Leuven* and *CEPR*

Department of Banking and Finance
University of Zürich
Plattenstrasse 32, CH-8032 Zürich, Switzerland
E-mail: steven.ongena@bf.uzh.ch

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Abstract

Economic theories provide conflicting hypotheses on how wealth inequality affects entrepreneurial dynamism and corporate financing. To empirically investigate its impact, we construct local measures of household wealth inequality based on financial rents, home equity, and 1880 farm land. We identify its effects on entrepreneurship by instrumenting it with land distribution under the 1862 Homestead Act or around US States removal of "death taxes". Wealth inequality decreases firm entry and exit across MSAs, and is associated with a deterioration of credit, schooling, and justice. New businesses also create fewer jobs and income per capita consequently grows slower. (96 words)

Keywords: wealth inequality, entrepreneurship, Homestead Act, EIG Taxes.

JEL: D31, G3, L26.

I. Introduction

Households' wealth inequality is a defining societal characteristic with important implications for financial and real activity.[1] The growth of wealth inequality during recent decades has returned the issue to the top of the agendas of policymakers and social leaders, but despite such renewed attention, economists are still far from reaching a consensus on its implications. In this paper, we study the relationship between household wealth inequality and the main drivers of economic activity: entrepreneurship, corporate financing as well as income per capita growth. Starting with Schumpeter and until more recently, entrepreneurship is considered an important component of economic growth (Schumpeter (1934); Aghion and Howitt (1992); Akcigit and Kerr (2018)), and it is therefore no surprise that the study of its determinants has gained attention in the academic literature (e.g., Dunne, Roberts and Samuelson (1988); Glaeser and Kerr (2009); Kerr and Nanda (2010)).

A perspective that dates back at least to Adam Smith conjectures a negative relationship between inequality and entrepreneurship.[2] In order to maintain their hold on power, wealthy elites may prevent the sound development of institutions conducive to economic growth such as banks, schools, and courts thus impairing economic development.[3] Unequal areas could also display little entrepreneurship as only the very rich may have enough net worth to start a business (Aghion and Bolton (1997)). Another view, rooted in the works of Malthus and Kaldor (1961), predicts a positive relationship between wealth inequality and economic

[1] Recent academic work consequently defines, measures, analyzes and explains inequality (e.g., Piketty (2014)).
[2] In "The Wealth of Nations," Adam Smith expressed concern that an unequal distribution of land may have had a negative impact on the development of the New World colonies. In his words: "*The engrossing of land, in effect, destroys this plenty and cheapness*" (Smith (1776), p. 726).
[3] Engerman and Sokoloff (1997), Glaeser, Scheinkman and Shleifer (2003), Sonin (2003), Berkowitz and Clay (2011), Rajan and Ramcharan (2011), and Acemoglu and Robinson (2013), pp. 152-158.

development as wealthy individuals may generate both high aggregate demand and high savings.[4]

The related empirical evidence is mixed as well. A group of papers shows a negative relationship between inequality and economic development (Alesina and Rodrik (1994); Persson and Tabellini (1994); Easterly (2007)), whereas other works find a positive or a non-linear relationship (Barro (2000); Forbes (2000); Banerjee and Duflo (2003)). All these studies however focus on cross-sections of countries, and they often employ income inequality as a proxy of wealth inequality.

Our study brings these alternative perspectives to the data and focuses on a novel setting based on households' wealth inequality measured at the US metropolitan statistical area (MSA).[5] Studying metropolitan statistical areas allows us to compare locations that are similar in terms of quality of the labor force, industry composition and demography, thus reducing concerns that omitted variables may be driving our results. At the same time, MSAs provide us with a sizable proportion of new business formation, as 80 percent of new firms are located in MSAs (see Robb and Robinson 2014).

Our contributions are twofold. We first provide different measures of local wealth inequality that identify the fundamental elements of wealth: households' financial rents and housing equity. Despite originating from different sources, these measures are highly

[4] "*There must therefore be a considerable class of persons who have both the will and power to consume more material wealth than they produce, or the mercantile classes could not continue profitably to produce so much more than they consume. In this class the landlords no doubt stand pre-eminent*" (Malthus (1836), p. 466)". The notion that wealthy individuals may help economic growth via their higher saving rates was formalized by Stiglitz (1969) and Bourguignon (1981).

[5] Our investigation at this level of geographical dis-aggregation is appropriate because US local administrations are often co-responsible (with state-level authorities) for many important elements of public life, such as the organization of schooling, the judiciary and the enforcement of the law and taxation. Additionally, the banking market in the US is still to a large extent local (see for example Bernstein, Giroud and Townsend (2016) and Gissler, Ramcharan and Yu (2018)).

correlated and they robustly document the pattern of regional wealth inequality within the United States. We then exploit the US institutional setting to design an identification strategy that allows us to connect wealth inequality to new business formation, corporate financing, and the local degree of economic development, and that minimizes endogeneity concerns.

Our first measure of local wealth inequality is based on the amounts of dividends earned by US households in 2004 (the first year this data is available). Assuming that every household invests in the market index, financial wealth is directly proportional to the amounts of dividends they receive. Since the Internal Revenue Service (IRS) provides data on dividends earned in every zip code, we are able to back out the distribution of financial wealth in each US MSA. Our second measure relies on households' housing equity data available from the US Census Bureau and the Federal Home Loan Mortgage Corporation (Freddie Mac). The US Census provides data, at the MSA level, on the value of housing units that are free of mortgages (i.e., the value of the house corresponds to the household's housing equity), whereas Freddie Mac provides data on all mortgages (and underlying house values) it has acquired between 1999 and 2004.

We use this information to construct the distribution of financial rents and housing equity at the local level and to compute Gini coefficients of financial and housing wealth inequality.[6] In Figure 1 we observe that, despite being originated from different sources, both Ginis produce a very similar map of wealth inequality.[7] California and the South appear to be the more unequal areas along both inequality measures, whereas the Midwest, and especially Minnesota and Wisconsin, are the least unequal. Figure 2 provides us with a preview of our

[6] Mian, Rao and Sufi (2013) likewise construct local measures of US households' net worth, while Saez and Zucman (2016) measure US-wide wealth inequality over a longer time period. Additionally we compute inequality measures based on the wealth holdings of the top 10 percent wealth owners.
[7] Not surprising given the correlation of 0.48 between the two measures.

main result, i.e., a negative relationship between wealth inequality (on the x-axis) and business formation from 2004 to 2012 (on the y-axis) across MSAs. Hence, more disparity in wealth is associated with less entrepreneurial activity.[8]

Establishing a causal relationship between wealth inequality and entrepreneurial activities however, is difficult, as wealth inequality itself may correlate with unobserved factors that are likely to affect our estimates. We alleviate this concern with an empirical strategy that relies on three ingredients. First, as our measures of wealth inequality are local (and because we know the location of the establishments), we can saturate our specifications with state, year, and/or, state-year fixed effects to account for any unobserved heterogeneity at those aforementioned levels. This procedure allows us to control for competing explanations of the deeply rooted determinants of institutions, such as individual states' type of colonization and legal traditions (see Acemoglu, Johnson and Robinson (2001) and Berkowitz and Clay (2011), pp. 16-59), as well as changes in their legislation and regulation. Importantly, while our focus is wealth inequality, the detail of our data allows always to control for the average level of wealth as well as income in the MSA.

Second, we instrument the contemporary measure of wealth inequality with the proportion of land assigned in each MSA via the 1862 Homestead Act and exploit the Act`s distribution of equal plots of land to early settlers in the 19th century. Indeed, the Homestead Act entitled any person who was head of families or 21 years of age to apply for a specific plot of 160 acres. The only requirement was that the homesteader should either live on the land or cultivate it for the next five years.

[8] In Figure 1, Panel B, we obtain a very similar result if we winsorize the employed housing wealth inequality measure at the 1 percent level.

We exploit the quasi-exogenous variation coming from early settlers' demand of land during the first ten years since first settlement, when the quality of the land was still unknown and the settlers reached the western frontier for the first time having little or no reliable information on the climate and the geography of the area. This allows us to consider the distribution of land in this period to be quasi-random: an assumption that we then verify in the data.[9] The Federal government intended to distribute public land via homesteading quickly, but this made the process chaotic: early settlers, while they had to compete with wealthy land speculators to obtain the land first, filled applications for plots of lands in areas whose features were still unknown to anybody. At the same time, homesteading, by assigning equal plots of land to households, may have biased the distribution of wealth towards equality from the very beginning, in most cases before communities were formed and before local institutions such as schools and the judiciary even existed.[10] As a result, the Homestead Act, by setting inequality first, allows us to capture the effects of initial inequality as opposed to inequality formed via institutions.

A natural concern with our instrument is whether homesteaders carried different human capital than an average settler or whether the land assigned via the Homestead Act was intrinsically different from an average lot of farmland. In both cases, we would have homesteading to directly affect entrepreneurship hence violating the exclusion restriction. We will address these and other issues with a series of tests intended to corroborate the validity of the identification strategy.

[9] The supply of land was fixed except for the presence of Native American tribes, water canals and railroads: all factors we control for in our analysis.

[10] As we will discuss later in the text, around 1860, the frontier line was just east of the Great Planes and most the Western States, with the exception of California, were scarcely populated (see Walton and Rockoff (2014), pp. 133-134)).

Third, we exploit state changes in Estate, Inheritance and Gift (EIG) taxes, the so-called "death taxes", between 1976 and 2000 and assess their impact on (new) firm entry and exit using a difference-in-differences approach. EIG taxes may be related to wealth inequality because they define the amount of wealth transferred from one generation to another. As a result, lower EIG taxes should promote or maintain a high level of wealth inequality. Beginning in 1976, more than 30 states have eliminated their incremental EIG taxes imposed on top of the Federal tax, thus lowering the EIG tax burden on their citizens (Conway and Rork (2004)). Our difference-in-differences analysis investigates whether states that lowered EIG taxes experienced a significant increase in wealth inequality and consequently a change in their entrepreneurial activities.

Our estimated coefficients robustly suggest that MSA-level inequality decreases firm entry into and exit from the MSA, indicating that wealth inequality has a negative effect on local business formation. Our estimates are not only statistically significant but also economically relevant. Going from the 10^{th} to the 90^{th} percentile in MSA-level wealth inequality leads to an approximately 20 percent increase in new establishments' entry and exit per capita. We also find that new establishments created in more unequal areas are more likely to be units generated by already existing firms rather than new ventures genuinely formed *ex novo*. In more unequal MSAs new establishments also create fewer jobs than in more equal MSAs and more unequal MSAs have lower income per capita growth.

Similarly, our experiment on EIG taxes reveals that States that lowered EIG taxes earlier experienced a significant increase in wealth inequality and a sizable reduction in new business formation.

This paper focuses on wealth rather than income inequality because wealth, more than income, captures the accumulation of fortunes and power throughout time via individuals' savings decisions and bequests. It gives a better representation of the relative power of different subjects in a society: a factor particularly important in the various explanations we test. We however construct measures of income inequality as well and we run specifications where we relate new business formation to both wealth and earned income inequality (that is income coming from households' labour). While wealth inequality always enters with a negative and statistically significant sign, we find that income inequality is positively associated with new business entry. We interpret this result as lending support to incentive theories of inequality: the prospect of higher income in case of success may encourage individuals to work harder and eventually take the risk of becoming entrepreneur (Mirrlees (1971)).[11]

Last, we study whether local institutions, such as the financial sector, schooling, and the judiciary, behave differently in areas with varying levels of wealth inequality. This is important as it may give an indication on how wealth inequality may reduce local business formation. As conjectured by Engerman and Sokoloff (1997), among others, wealthy elites may in fact prevent the development of institutions supportive of entrepreneurship and economic development. In more unequal areas we find less venture capital financing to local enterprises, fewer bank branches per capita, and less bank lending to small and medium enterprises. To a lesser extent, higher wealth inequality also leads to a lower proportion of public school revenue coming from local sources, lower school expenditure per pupil, and a

[11] While we agree that persistent income inequality may lead to large wealth inequality, our measure does not capture persistence but just income inequality at the beginning of our sample period.

lower inflow of educated people from other geographical areas.[12] Finally wealth inequality is also associated with an inefficient civil justice system: everything else equal, first-degree civil justice trials have a longer completion time in unequal counties.[13]

In sum, we provide a variety of findings that consistently suggest that wealth inequality is an important determinant of entrepreneurship and the type and amount of financing entrepreneurs receive.[14] Our analysis also adds to a growing literature on finance and inequality. While most of the work in this area studies how finance may affect the degree of income or wealth inequality (see Demirgüç-Kunt and Levine (2009) and, more recently, Beck, Levine and Levkov (2010) for a review), our paper studies how wealth inequality affects financial outcomes (and, in this sense, it is more similar to Rajan (2009), Bagchi and Svejnar (2015), and Degryse, Lambert and Schwienbacher (2017)). Last but not least, we broadly contribute to the literature that relates individual's net worth to the decision of becoming an entrepreneur (Hurst and Lusardi (2004)).

The rest of the paper is organized as follows. Section II discusses the background and our empirical strategy in terms of specification, measurement of inequality and identification. Section III discusses the results on local wealth inequality, new business formation, job creation and income per capita growth. Section IV links local wealth inequality to the development of the local financial sector, education and to the efficiency of the judicial system. Section V concludes the paper.

[12] On the theory relating income and wealth inequality to education see also Loury (1981) and Galor and Zeira (1993).

[13] We also run a formal analysis of the causality chain using the methodology developed by Becker and Woessmann (2009). We estimate a simultaneous equation model where in the first stage we relate wealth inequality to the proportion of land assigned via the Homestead Act in the MSA. In a second stage we regress the quality of local institutions on wealth inequality. In the third stage, we relate institutional quality to entrepreneurship. See Appendix B for details.

[14] See Black and Strahan (2002), Berkowitz and White (2004), Perotti and von Thadden (2006), and a review by Carlino and Kerr (2015), among others.

II. Inequality and Entrepreneurial Outcomes

A. Background

The idea that wealth inequality may be detrimental to economic outcomes and business formation can be found in North (1981), pp. 100-115, Engerman and Sokoloff (2002) and Acemoglu and Robinson (2013), e.g., pp. 152-165, among others. The common theme behind these studies is that the wealthy may use their influence to distort the development of the local financial sector, schooling, and the judicial system to promote their own interests. Poorer education, less efficient judiciary and financial markets may discourage individuals from starting a business and impair economic growth.

A relevant factor for our analysis, as it studies wealth inequality at the local level, is that in the US, local administrations are often co-responsible (with state-level authorities) for many important elements of public life, such as the organization of schooling, the judiciary and the enforcement of the law and taxation. As a result, our setting allows to see whether local wealth inequality is related to local institutions.

Some studies have already noted a possible interplay between local institutions and redistribution in the US. It is for example commonly accepted that wealthy neighborhoods in the US have traditionally favored financing of public schools based on property taxes. This system implies that there is no redistribution to poorer neighborhoods and leads to large disparities in the amount of funding available to schools located in different areas. As states began to introduce some form of redistribution in school financing during the 1980s (Card and Payne (2002)), wealthy neighborhoods lobbied for lower property taxes because they did not want to redirect resources to poorer districts (Stark and Zasloff (2003)). Consistent with

the idea that inequality could be detrimental to educational outcomes, Goldin and Katz (1998) and Galor, Moav and Vollrath (2009) show that both high school graduation rates and that expenditures on public education in the 20th century were lower in states that displayed higher degrees of wealth inequality. In terms of the judiciary, the election of state judges may enable wealthy individuals to distort judicial decisions in their favor by contributing to judges' electoral campaigns. Supporting this possibility, a New York Times article published in 2006, for instance, documents that Ohio Supreme court judges ruled in favour of their contributors 70 percent of the time (Liptak and Roberts (2006); also Berkowitz and Clay (2011), p. 133).

Wealth inequality could also have a direct negative effect on entrepreneurship. Aghion and Bolton (1997) argue that in an economy with credit market imperfections, the level of an individual's wealth increases her likelihood to start a business. This implies that more unequal areas will have lower business formation as fewer individuals (possibly only the very rich) will have enough wealth to overcome credit market imperfections.

An alternative view considers wealth inequality as a positive factor of the economy. With their deep pockets, wealthy individuals may help stabilize aggregate demand and reduce the average cost of production of new, high-tech goods, making them more accessible to the middle class (Matsuyama (2002)). The existence of inequality in income and wealth may encourage individuals to work harder: rewarding employees with equal wages may discourage them to produce the desirable level of efforts (Mirrlees (1971)). Philanthropy and charity may produce enough resources to extend schooling and economic opportunities to the poor, enhancing human capital formation. In a 2001 article, *Forbes* magazine, for example, espouses the view that, traditionally, charity in the United States "*concentrated in education*

and acculturation" and "*stressed the skills and attitudes of self-reliance and personal responsibility.*"

B. Empirical Strategy

1. Main Specification

In our main analysis, we will estimate the impact of wealth inequality on the number of establishments' entries and exits using data at the MSA level, as well as on job of startups.[15] In particular, for entry and exit, we will estimate the following equation:

$$Y_{j,t} = \alpha + \alpha_s + \alpha_t + \beta Wealth\ Inequality_j + Controls_{j,t-1} + \varepsilon_{j,t} \qquad (1)$$

Where, $Y_{j,t}$ indicates the natural logarithm for the number of establishments' entries and exits in the Metropolitan Statistical Area j at year t. In line with Kerr and Nanda (2010), we will focus on gross business entry and exit per capita. The variable *Wealth Inequality* indicates one of our measures of local wealth inequality. *Controls* stands for a set of MSA controls, such as population, income per capita, the catholic to protestant ratio, and housing prices, all detailed in Appendix Tables A.I and A.II. These variables will allow us to control for time varying MSA characteristics, for instance, the catholic to protestant ratio may proxy for differences in the degree of risk aversion in the MSAs (see Hilary and Hui (2010)). Finally, the level and growth of house prices allow us to control for the possibility that home owners may borrow against the value of their house in order to set up a new business.

[15] In the analysis of entry and exit of new firms, we use data at the MSA level, as data at the county level are not publicly available.

2. Measuring Wealth Inequality

Obtaining representative measures of wealth inequality at the local level is challenging. We construct two proxies for local wealth inequality that embody the main forms through which wealth can be accumulated: financial capital and housing. The first one is based on current levels of financial wealth and it is broadly based on a methodology introduced by Mian, Rao and Sufi (2013) and Saez and Zucman (2016); it intends to construct local-level measures of household net worth. The second measure is based on the available information of housing equity.

The measure of financial wealth inequality looks at the amounts of dividends and interest earned by US households in 2004, the first year in our sample period, as reported by Internal Revenue Service (IRS) Statistics of Income (SOI) data. The IRS-SOI data report the total amount of dividends and interest income received by US households in a certain zip code. The information is reported as a total amount per zip code and is divided into five households' income groups, ranging from low income to high income. Under the assumption that a typical household owns the market index for stocks and bonds, the amount of financial rents it receives depends only on the quantity of stocks and bonds it holds. We use this information to construct a Gini index of wealth inequality based on financial rents. The procedure we adopted to construct the index is detailed in Appendix Table A.III.[16]

The second measure of inequality relies on housing equity. From the Census Bureau we obtain data on the values of all houses that are fully owned by a household and do not have an outstanding mortgage. The census provides this information dividing houses in bins

[16] In an addition to the Gini index, we construct an alternative measure of wealth inequality: the proportion of households in the MSA/County that do not have financial wealth. The results we obtain with this alternative measure are the same (and, if anything, stronger) as those obtained with the Gini index.

corresponding to their different values in 2004. From Freddie Mac, we obtain information on housing equity for a more recent period of time. Freddie Mac has made available the details of a large selection of mortgages it purchased between 1999 and 2004.[17] The data includes the MSA where the house was purchased, the value of the house at the time of the purchase, and the value of the mortgage originated. Notice that between 1999 and 2004 Freddie Mac covered a large proportion of the mortgage market, about 27 percent. This information allows us to compute housing equity, divide households into the same housing value bins used in the census, and compute a Housing Wealth Gini index per MSA considering both housing equity between 1999 and 2004 and the value of any house that is free of any mortgage (using the latter set we will also construct a No Mortgage Housing Wealth Gini).

Both our inequality measures are imperfect proxies. The Financial Wealth Gini relies on the assumption that every individual owns the same (or very similar classes) of stocks (and, as a result, they obtain the same return).[18] The housing wealth inequality misses information of housing equities for houses purchased before 1999 with a mortgage still attached and relies on the information provided by Fannie Mae. Yet, Figure 1 reveals that the maps of wealth inequality originating from our measures are remarkably similar. We observe that even within States there is quite some variation in the level of wealth inequality. MSAs with a higher level

[17] The mortgages we consider in our data are provided by the Fannie Mae Loan Performance dataset which includes over 35 million mortgage loans originated after January 1, 1999. The mortgages considered in the data are fixed rate, fully amortizing mortgage loans, with a maturity that is larger than 5 years but lower than 35 years. These mortgages were also supported by full borrower's documentation. The data excludes riskier mortgages such as Alt-A, only interest mortgages and mortgages with a loan to value ratio greater than 97 percent.

[18] Piketty (2014), on pp. 439-443, describes how wealthy investors tend to obtain higher returns on their investments. Using detailed data on Swedish households, Bach, Calvet and Sodini (2017) show that top 10 percent wealth owners obtain returns in the their investments that are 2.5 percentage points higher than a median household. These are higher returns are driven by a larger exposure to various risk factors.

of wealth inequality tend to be concentrated in the South and to some extent in California. The Midwest appears to have a more equitable distribution of resources.[19]

The average Gini coefficient we obtain is 0.87 for financial wealth inequality and 0.77 in the case of housing wealth inequality. These figures are also in line with measures of household wealth inequality obtained at the aggregated level. For example, De Nardi (2004) shows that the Gini coefficient for the entire US is 0.78 based upon household wealth data from the Survey of Consumer Finances from 1989. Relying on the same survey, Wolff (2011) finds that the Gini coefficient is 0.83 for 2007. To provide some comparison terms, the first decile of MSA housing wealth distribution is about 0.67, and indicates a level of inequality comparable to France and the Netherlands in the year 2000 (see Davies, Lluberas and Shorrocks (2017)). The top decile of housing wealth inequality is about 0.82, a level similar Brazil or Peru', as recorded in 2014, or to pre-industrial societies in Europe (see Credit Suisse, *Global Wealth Book*, 2014; Scheidel (2017), p. 98 and p. 337).

Using the same information, we constructed also proxies of the amount of dividend received by the top 10 percent dividend earners and the housing wealth owned by top 10 percent house owners (see Appendix A for the details on their construction).[20]

Previous literature has also considered land as another possible measure of wealth inequality (Alesina and Rodrik (1994); Galor, Moav and Vollrath (2009); Rajan and Ramcharan (2011); Vollrath (2013)). To construct such a historical measure, we obtain information on farmland sizes at the county level from the 1880 US Census. More precisely,

[19] Unfortunately, as we do not have household level data on wealth, we cannot compute a Gini index that simultaneously place in different wealth categories the same household. For instance, a household may have high housing equity but low financial wealth.

[20] Since we do not have households level data on dividends and housing equity, we are forced to construct proxies of these measures relying on more aggregate data.

for each county, we have information on the total number of farms that – based upon their total acres of farmland – fall within a certain size bin. Farms are assigned to one of seven bins: under 10 acres, from 10 to 19 acres, 20 to 49 acres, 50 to 99 acres, 100 to 499 acres, 500 to 999 acres, and 1,000 or more acres. The average 1880 Gini index is 0.44. It is significantly lower than the contemporary measures as it looks only at the distribution of land and it does not consider individuals that are not land owners.[21]

Table I presents the correlations among our inequality measures. The housing and the financial rents Gini have a positive correlation of about 48 percent. The proxies of the proportion of dividends held by the 10 percent dividend earners and the proportion of housing wealth held by the top 10 percent house owners are highly positively correlated with the respective Gini indexes. We also find that 1880 land inequality displays a 37- and 26-percent positive correlation with Financial Wealth Gini and the Housing Gini, respectively.

3. Identification

Wealth inequality could be correlated either with omitted factors or with the degree of entrepreneurship itself. The possibility of reverse causality is based on the fact that entrepreneurs are a small fraction of the population but hold a large share of the total wealth (Cagetti and De Nardi (2008)). When entrepreneurial activities are successful, most of the rewards are accrued among a limited number of individuals, which, in turn, increases wealth

[21] The Financial Wealth Gini is on average higher than the other two Ginis because a relatively large proportion of households do not report any wealth held in equity: about 78 percent. The IRS reports changes with respect to the number and types of income bins after 2007, as a result it is difficult to compare Gini indexes throughout our time period. However, we find that the proportion of individuals not holding any financial wealth in 2012 is very similar to what we have in 2004, again 78 percent. This also suggests that the 2008 financial crisis as well as the great recession did not have a large impact on the distribution of financial wealth.

inequality. From this perspective, we may expect to find a positive correlation between wealth inequality and entrepreneurship.

Wealth inequality could also be correlated with policies introduced by states, local income, and the racial composition of the geographical area. While we introduce variables that expressively control for these factors, we also address this problem in several ways.

a) State Fixed Effects and Trends

First, as we discussed, our measure of wealth inequality is constructed at either the MSA or the county level, which allows us to control for state fixed effects and state trends in the analysis. These are a relevant feature of our identification strategy, as other main deeply rooted determinants of institutions, such as legal and colonial origins, are defined at the state level. Berkowitz and Clay (2011) give a precise overview of which US states have civil law (rather than common law) traditions and link their legal traditions to the countries of origin of early settlers.

Importantly, a study of metropolitan statistical areas also enable us to better control for omitted variable bias as we compare locations that are similar in terms of quality of the labor force, and demography.

b) Instrumental Variable Analysis: The Homestead Act

Second, we construct an instrumental variable analysis based on the distribution of land to early settlers via the 1862 Homestead Act.[22] To encourage migration into the largely

[22] As an alternative set of instruments for wealth inequality we also employ weather and soil conditions because different climates and geographical environments may favor the production of one type of crop over another. Engerman and Sokoloff (1997) and Engerman and Sokoloff (2002) suggests that climates that are best suited to large plantations, such as sugar or tobacco plantations, will induce relatively high economic inequality. The production of these crops comes at a high fixed cost; as a result, in equilibrium, the market can support only a

unexplored areas of the West, the Federal government allocated free plots of land, all equal in size, to settlers. The Act of 1862 entitled any persons who were heads of families or 21 years of age to apply for a specific homestead. The only requirement was that the settler should either live on the land or cultivate it for the next five years (Gates (1969), pp. 393-394).[23] The idea is that the Homestead Act, by assigning equal plots of land to early settlers may have biased the local initial conditions towards a more equitable distribution of resources, before communities were even formed and any local institution such as school and the judiciary were established.[24] Most of the land assigned via Homestead was in fact beyond the 1860 frontier line as indicated in Figure 3 and it was scarcely populated. As a result, the Homestead Act allows us to focus on the initial level of inequality that characterized a certain area, rather than subsequent inequality that could have been generated by the local institutions themselves. We conjecture that areas with a larger proportion of land assigned via the Homestead Act should be more equal today.[25]

Naturally, an instrument ought not to be correlated with other factors that may directly explain the pattern of contemporary entrepreneurship. For instance, the equal distribution of

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few farms. The outcome is thus a society controlled by few wealthy landowners. Conversely, climates supporting crops such as wheat will result in a more equal society. The production of these crops does not require high fixed costs; hence, the market can "bear" more producers. These societies will be more equal and be composed mainly of small landowners.

[23] Settlers who decided not to meet the five year requirement could obtain full title to the land by paying a minimum price of $1.25 an acre.

[24] We consider land assigned via the original Homestead Act and subsequent acts such as the 1873 Timber Culture Act, the Desert Land Act, the 1877 Desert Land Act, the 1909 Enlarged Homestead Act, and the 1916 Stock-Raising Homestead Act. Since the 1862 Homestead Act corresponds to about 91 percent of land distributed via homesteading, results do not change.

[25] The idea that by promoting equality the Homestead Act could have produced better local institutions was also recognized by the Federal Government in the 19th century. The 1884 report of the Public Land Commission described the Act in the following terms: "*The Homestead Act is now the approved and preferred method of acquiring title to the public lands.[…] It protects the Government, it fills the States with homes, it builds up communities, and lessens the chances of social and civil disorder by giving ownership of the soil, in small tracts, to the occupants thereof. It was copied from no other nation's system. It was originally and distinctively American, and remains a monument to its originators*." (Donaldson (1884), p. 350).

land may have a direct impact on business formation today by affecting subsequent land and farm value. To the extent that land can be used as collateral to receive a loan and start a new business, this would violate our exclusion restriction.[26] To alleviate this problem we focus on the proportion of land assigned via the Homestead Act during its first ten years, for MSAs already settled in 1862, or during the first ten years since the first settlement in the MSA, for MSAs whose first settlement occurred after 1862.[27]

In the early years, land was assigned both via direct sales from the federal government and via homesteading. Both land speculators and early settlers struggled to obtain what exactly were the best plots of land in an area (Gates (1936)). Early settlers were confronted with a new and unknown environment and they lacked the knowledge about the quality of the land and the type of weather that characterized the areas they moved into. As late as 1897, the National Weather Bureau's admitted the primitive state of knowledge about rainfalls and recognised that there were few observed patterns that allow the prediction of droughts (Hansen and Libecap (2002)). The settlers also missed the required knowledge to interpret the consequences of weather and soil quality on agriculture. All these circumstances suggest that the proportion of land assigned via Homestead Act may have an important random component determined by settlers' beliefs on the quality of soil and weather of the desired locations, which many times turned out to be faulty.

[26] Few recent papers have related real estate value to entrepreneurship, see Adelino, Schoar and Severino (2015), Corradin and Popov (2015), and Schmalz, Sraer and Thesmar (2017). Kerr, Kerr and Nanda (2015), however, provide evidence suggesting that land and home values may be not be a particularly important determinant in the decision of becoming entrepreneur.

[27] We compute the proportion of land assigned via the Homestead Act as the total amount of land assigned via Homesteading divided by the total amount of land assigned in any form to any subject by the Federal Government. This measure has the advantage to capture the strength of the homesteading as a tool of land distribution vis-à-vis other available means. At the same time, it automatically excludes land that the Federal government could not assign because uninhabitable or not suited for any economic activity. We rerun our analysis using either 5, 15 or 20 years of homesteading intensity.

It has also been observed that homesteading itself may have had an impact on the subsequent value of farming and the land (Hansen and Libecap (2004)). For instance, in the Great Planes, the small plots assigned via the Homestead Act were not adequate for the type of soil and weather that characterized the area. The large number of farm failures that followed the 1930s Dust Bowl has been attributed to the small size of farms in the Great Planes, a legacy of the Homestead movement. Larger plots would have been more appropriate and they would have allowed farmers to make necessary investments to prevent drought and strong winds to damage their crops. We will also run the analysis excluding areas that have been affected by the 1930s Dust Bowl and the entire Great Planes area as, if any, the effect of homestead on entrepreneurship on farm values should be stronger in these areas.

Another possible concern relates to the quality of human capital of early settlers. It could be that homesteaders carried different human capital than an average migrant (different entrepreneurial spirit, education, or cultural background). To the extent that such differences are persistent throughout the years, homesteading could also affect the pattern of entrepreneurship via individuals' skills.

We tackle this issue by studying a distribution policy where land was randomly allocated to the local community via a lottery system: the Georgia land lotteries 1827-1835. Restricting our analysis to Georgia and focusing on the proportion of land distributed via lottery allows us to abstract from concerns related to the quality of the human capital, as land was given randomly and nearly the entire eligible population participated in the lottery (Bleakley and

Ferrie (2016)).[28] Our regressions will also include a measure of literacy of the local population as a proxy for human capital, as obtained from the US Census from 1860.

Whether homesteading has been a long lasting policy that affects the contemporary distribution of wealth is an empirical issue that our first stage regressions will resolve. To reassure that our analysis really captures a relation between the Homestead Act and the level of inequality, we will also see whether the proportion of land assigned via the Homestead Act explains land inequality during the late 19th century, a period that is closer to the enactment of the legislation.

c) Estate Inheritance and Gift Taxes

Third, we exploit changes in Estate Inheritance and Gift (EIG) taxes that took place in various states between the 1970s and 2000. At different points in time beginning in 1976, 31 states repealed their "death" taxes. In particular, states switched from a system in which state EIG taxes were a percentage computed on top of the corresponding federal EIG tax to a "pick up" system in which the state only "picks up" a proportion of the Federal EIG tax applied to its citizens without increasing the total tax burden. The reason for these changes has been attributed to tax competition among States. State authorities used EIG taxes as a tool to attract, or not lose out on migration of (wealthy) elderly citizens (see Conway and Rork (2004)). As changes in the demographic composition of the population appear to be important for the decision and timing of the repeal, our analysis will control for these factors.

[28] While in each lottery the land was mostly distributed in equal allotments, the Georgia Land lottery is not considered a form of homesteading because of different rules in the assignment of property rights. As a result, we will keep it as a separate instrument and will not include it as part of our main instrument. Including it however, does not change our main results.

EIG taxes may matter for wealth inequality, as they define the amount of wealth transferred from one generation to the next. In principle, systems with very high EIG taxes should promote more equality, as wealthy parents will not be able to transfer all their wealth to their children. Conversely, low EIG taxes should make it easier to pass wealth from one generation to the next, promoting more inequality. By preserving high levels of wealth throughout generations, low EIG taxes, may contribute to maintain a system of local public policies that favour the wealthy.[29]

III. Business Dynamics

A. Data Sources

We obtain data on establishments' entry and exit from the Business Dynamics Statistics (BDS), a database set up by the US census that provides annual measures of, amongst other things, establishment births and deaths, and firm startups and shutdowns.[30] The BDS data are available only at the US MSA level and provide information from 1976 until 2012. It covers a wide range of industrial sectors including agriculture, manufacturing, wholesale trade, retail trade and services (amongst others). Following Kerr and Nanda (2009), we define entrepreneurship as the entry of new establishments, but we will also distinguish whether

[29] Low EIG taxes may even reinforce such policies to the extent that they induce migration of wealthy elderly in the area. For instance, it appears that wealthy elderly favor a system of property taxes intended to finance only the local school district and they do not want to redistribute to other districts (see Brunner and Balsdon (2004)).
[30] The BDS describes an establishment as a fixed physical location where economic activity occurs. Firms are defined at the enterprise level such that all establishments under the operational control of the enterprise are considered part of the firm (see: https://www.census.gov/ces/dataproducts/bds/methodology.html#coverage). The BDS data excludes self–employed and domestic service workers who not necessarily perform entrepreneurial activities.

these establishments are related to newly created firms as opposed to already existing companies. We provide the resultant descriptive statistics on all variables in Table II.

We collect the data on our main dependent variables for our later financing and employment regressions from several resources. We rely on the National Venture Capital Association's Venture Capital Investment data for information on the reliance of venture capital financing (in $ amounts per capita) in a given area. This information is available for 2015 only. From the Business Dynamics Statistics (US Census Bureau) we additionally obtain data on yearly job creation in a given MSA, as defined by new employment created by new establishments in a given year. This information is particularly useful for us to analyze the effect of inequality on job creation as well.

Turning to possible channels through which inequality can affect entrepreneurial dynamism, we obtain as a proxy for bank financing the yearly number of banks per capita from the US Census Bureau. Moreover, we abstract from the Community Reinvestment Act database information on the amount of yearly small business loans originated per MSA. Additionally, we collect schooling information on the percentage and total amount of school financing coming from local sources, as well as the total amount of school expenditures per pupil from the Annual Survey of School System Finances set up by the Census Bureau. We obtain judges' sentencing data from 2005 from the Bureau of Justice Statistics (BJS) for the 75 most populous US counties. What is particularly useful from this data source is the sentencing length, which we use as a proxy for judicial efficiency and relate it to our inequality measures. We download the various State and MSA characteristics from the US Census Bureau.

We retrieve data on homesteading intensity, which we use as instrumental variable for our contemporary inequality measures, from the Bureau of Land Management General Land Office Records (BLM GLO records). The records contain information on individual patents (name of the individual, plot size and location as well as year granted) granted by the Bureau of Land Management. We restrict our dataset to those patents that fall under the authority of the original Homestead entries from 1862.

B. Results

1. Business Dynamics

We begin by testing how local wealth inequality affects business dynamics in US *Metropolitan Statistical Areas* (MSAs). Table III provides the first estimation results. We relate the local measure of inequality based on financial wealth to the yearly number of new establishments per capita, as well as to the total number of establishments that become inactive in a given year.

In Column (1) we start with a univariate OLS estimation that relates establishment entry per capita to financial wealth inequality. In Column (2) we repeat the estimation and include state and year fixed effects and control for the MSA population as well as a set of basic MSA characteristics which also includes the level of MSA Wealth and MSA real GDP.[31] The latter specification is our benchmark specification which serves as a basis from which all-inclusive saturation, instrumentation and alteration can be pursued.

[31] The basic MSA controls are MSA Wealth, MSA Catholic to Protestant Ratio, MSA Land Size, MSA Real GDP per Capita, MSA House Price Index (Level), MSA House Price Index (Change), Change in MSA Age Composition, and MSA Population Growth.

In both regressions, we see a negative correlation between financial wealth inequality and number of new establishments per capita, statistically significant at the 1 percent level. The economic significance is sizable: a movement from the 10^{th} to the 90^{th} percentile in the distribution of wealth inequality reduces the number of new establishment per capita between 13 percent and 15 percent. In Specification (3), we explore whether our basic result is driven by difference of wealth between the rich and the poor or by a "fat left tail", i.e., more unequal MSAs tend to have higher poverty rates. We include the percentage of population in poverty. While we still find a negative and statistically coefficient for financial wealth inequality, Poverty has also a negative coefficient but it is not statistically significant at the conventional levels. Column (4) adds percentage of white people living in the MSA to the specification in Column (3). More unequal areas may also be ethnically more diverse. While we find little effect of the percentage of white people on the level of entrepreneurship, financial wealth inequality still has a negative and statistically significant coefficient. In Specification (5), we add state-year fixed effects.

Columns (6) to (8) confirm that local inequality matters for business formation dynamics. These columns relate local inequality to the yearly number of establishments per capita that become inactive (natural logarithm). Column (6) looks at total establishment exits per capita. These variables' economic relevancy is practically similar: a one-standard-deviation increase in MSA wealth inequality decreases the number of establishments that become inactive by approximately 10 to 12 percent, indicating that business formation (i.e., establishment entries and exits) is less dynamic in more unequal metropolitan areas. Additionally, this result confirms that larger values of wealth inequality are related to lower business dynamics. In the spirit of Kerr and Nanda (2009), we also divide establishments exits between Churning exits

(establishment closures within 36 months of formation) and Schumpeterian exits (closures beyond 36 months). We present the results in Columns (7) and (8). Remarkably, wealth inequality has a negative impact on both Churning and Schumpeterian exits. The economic significance is also similar: a one-standard-deviation increase in wealth inequality reduces both the Churning and Schumpeterian exits by approximately 10 percent.

2. Instrumental Variable Analysis

In this section, we tackle the endogeneity issue by performing an IV analysis. We use the proportion of land distributed via the Homestead Act in the first 10 years since 1862, if the MSA was already settled, or the first ten years since first settlement for MSAs that were settled later. In Table IV we present the regression with the Financial Wealth Gini, whereas we report the results on the Housing Wealth Gini in Appendix Table A.V.

Table IV presents both the coefficient of the instrumental variables as well as the F-statistic of the first stage. In every specification, the coefficient of Proportion of Homesteaded Land is negative and statistically significant. This means that a higher proportion of land homesteaded in the early years of the Act (or early years of settlement of the area) is negatively related to the contemporary measure of wealth inequality. This is in line with our conjecture that more homesteading may have promoted a more equal distribution of resources. With the exception of Column (1), the F-statistics are always above ten indicating that we have a statistically powerful first stage. The only exception is Column 1, where the F-test is just below 10 setting at about 9.8.[32]

[32] The partial R-Square of the excluded instruments in the first stage regression is 5 percent, a more than acceptable value when we compare it to the examples reported by Jiang (2017). This confirms the proportion of land assigned via homesteading yields a powerful first stage.

Table IV Column (1) presents the baseline specification that corresponds to the controls we use in our benchmark specification in Table III Column (2). We observe that the coefficient of the Financial Wealth Gini is negative and statistically significant at the 1 percent level confirming the OLS results. The economic significance is also similar to the OLS regressions: the number of new establishments per capita declines with about 10 percent, when we move from the 10^{th} to the 90^{th} percentile of wealth inequality.

Column (2) adds three controls to the specification in Column (1). The amount of land available for homesteading depended on whether there was a railroad line or a water canal in the area. In these cases, railroads and canal lands would have been given by the Federal government to the respective companies managing the lines and the waterworks (Gates (1936)). We control for two dummy variables that indicates whether in the area there was a canal or a railway line passing in 1860. Also, the amount of land to be homesteaded may have depended by the presence of Native American tribes in the area, as it has been reported that homesteading was also a policy to mobilize settlers against Native Americans (Allen (1991)). We control for a dummy variable that takes the value of 1 if there were recorded Native American tribes in the area in 1860 and 0 otherwise. Again, the coefficient on Financial Wealth Inequality is negative and statistically significant at the 1 percent level.

The specifications in Columns (3) and (4) check whether homesteading may have a direct impact on entrepreneurship today via reflecting or affecting the value of farmland. In Column (3), we add the average value of the land in the MSA between 1870 and 1950 as an additional control. In Column (4), we exclude the States that were affected by the Dust Bowl in the 1930s. Also in these cases, the coefficient on Financial Wealth Inequality remains negative

and statistically significant at the 5 percent and 10 percent level, respectively, and they maintain a similar economic significance when compared to the previous specifications.

The specifications in Columns (5) to (7) tackle concerns related to the quality of the human capital. Column (5) reconsiders the full sample and adds an extra control: the proportion of individuals in the MSA that could not write in 1860. Column (6) excludes the States where no land was assigned via the Homestead Act to control whether there was anything special about people migrating to the West that may affect our results.[33] Column (7) considers only Georgia and it uses a different instrument: the proportion of land assigned via lottery in a MSA between 1809 and 1833.[34] Also in all these cases, the result still holds and indicates a negative relationship between wealth inequality and new establishments per capita.[35]

We also verify in the data our identification assumptions. The quasi-random allocation of land originated by the Homestead movement would imply that there is no relationship between the future value of farmland and the proportion of land allotted via the Homestead Act. We see whether this is true by relating the value of farmland in various years between 1870 and 1959 to our instrument, MSA homesteading intensity. We report the results in Appendix Table A.IV. In every specification we do not find any statistically significant

[33] In unreported results we also restrict the sample to MSAs that were settled after 1862 and we obtain similar results to what we report in the main text.

[34] Although we do not have information about the precise amount of land that was assigned via lottery in each MSA, we do know the counties where land was given via lottery. Our instrument is based on this information. We first assign each county that experienced any assignment of land via lottery a 1 and code all other counties being equal to 0. We then aggregate these values into corresponding MSAs and take the average of the indicator variable. Our instrument, for example, will give a value of 1 to MSAs in which every county experienced a lottery or zero if no county experienced a lottery. Values between 0 and 1 are possible if some counties in the MSA had a lottery and others did not. The specification in Column (7) additionally controls for the size of the lot assigned via lottery as different lotteries may have assigned plots of land of differing size.

[35] In unreported regressions, we also control for measures that identify the place of origins of the early settlers of the MSA. In particular, the proportion of them born in the United States versus the proportion born abroad and if born abroad, the country of birth. It is possible that early settlers could have "carried with them" their native institutions to the new place of residence hence affecting local institutional quality and entrepreneurship. Results are unchanged when we control for these factors.

relationship between the value of the land and the instrument. The sign of the relationships also flips depending on the type of controls we use. In addition to the results of this table, to the extent that homesteading may affect contemporary patterns of entrepreneurship via land value (rather than inequality), our regressions will control for the average value of the land per acre in each MSA during the 19th and 20th century. As we will observe in the discussion of the results, the proportion of land assigned via the Homestead Act may also depend on the presence of railroads lines, water canals and Native American tribes, all factors that we take into account in our empirical analysis.

We also field past local weather conditions to form an alternative set of four instruments (Engerman and Sokoloff (1997); Engerman and Sokoloff (2002)). In particular, we use the average and standard deviation between 1895-2003 of both the precipitation and the temperature of the district,[36] and the soil salinity and depth in the MSA. Estimates for these IV regressions are in Appendix Table A.VI and confirm our main findings so far. In unreported analyses we rerun all of above analyses restricting our sample to end in 2006. The results remain largely unaffected, indicating that the financial crisis is not driving our findings.

3. The Removal of State EIG Taxes and Entrepreneurship Dynamics

To further address endogeneity concerns, we exploit changes in Estate Inheritance and Gift ("death") taxes that took place in various states between the 1970s and 2000. These widespread changes in state EIG taxes show substantial cross-sectional and time series variations, which we exploit in our analysis. We estimate the following equation:

[36] A district is defined by US meteorologists as a group of clustered counties with similar climatic conditions.

$$Y_{j,t} = \alpha + \alpha_{msa} + \alpha_t + \beta Post_{jt} + Controls_{j,t-1} + \varepsilon_{j,t} \qquad (2)$$

Where, $Y_{j,t}$ indicates either wealth inequality at the State level or the natural logarithm of the number of firms' entries and exists in the Metropolitan Statistical Area *j* in year *t*. The variable of interest is $Post_{jt}$. Similar to Kerr and Nanda (2010) we study specifications in which we define $Post_{jt}$ to equal the (log) number of years since the reform was introduced. Because the data have a panel dimension, we control either for MSA or State fixed effects, and for year fixed effects. As the EIG tax reforms are defined at the state level, we cluster the standard errors at the corresponding state level. We consider data between 1976 and 2000. In 2001, the federal government introduced legislation that phased out the pick-up system, generating an important confounding event.[37]

We present the results in Table V. In Columns (1) and (2), the dependent variable is a Gini index of wealth inequality at the State level. We compute the Gini index using data from the Panel Study of Income Dynamics (PSID) survey in four snapshots years (1984, 1989, 1994, and 1999) for which data on households' wealth have been collected.[38] These results need to be taken cautiously, as the PSID survey is not designed to be representative within a State. However, we believe they still provide useful results about the relationships between "death" taxes and inequality. Both Columns (1) and (2) show a positive relationship between the removal of EIG taxes and wealth inequality suggesting that lowering EIG taxes leads to an increase in wealth inequality at the State level.

[37] Most states responded to the federal legislation by re-initiating a state EIG tax equal to the amount of the federal credit as determined by the IRS code as of January 2001. We also check for other confounding events such as systematic changes in the local incentives to set up a business, but we found no evidence of this.

[38] The data comes from PSID supplemental wealth files. We aggregate the information about households' wealth to construct a State Gini index of inequality using the survey sample weights.

In Columns (3) and (4), the dependent variable is the log of the total number of firm entries. Column (4) shows that the coefficient on the number of years since reform is negative and statistically significant at the 10 percent level, indicating that switching to a pick-up system reduces the number of new firms that enter the MSA over time. To the extent that lower EIG taxes promote more wealth inequality, this result is in line with our baseline results that show a negative relationship between local wealth inequality and entrepreneurship dynamics. Between 1 and 2 years after the introduction of the new pick-up system, new business formation is reduced by 3 percent. This effect is sizable, considering that the mechanism we attempt to identify relies on institutions and the provision of local public goods, which take a long time to change. Importantly, our effect is especially driven by States that deregulated earlier and, in principle, had more time to change the institutional settings.

The introduction of the pick-up system tends to decrease the number of firm exits when we consider the number of years since reform. The economic significance is similar to the economic significance of firms' entry. After the enactment of the pick-up system, the number of exits declined by 2.5 percent (between 1 and 2 years after the reform).

While we interpret these results as being supportive of a wealth inequality channel, it is important to notice that a reduction of EIG taxes also increases the total wealth of an MSA, and not only its distribution. However, this effect would result in more entrepreneurship and work against the results we present in Table V, as wealthier individuals, displaying higher net worth and having more credit capacity, should be more likely to open a business.[39]

[39] The literature mainly suggests a positive relationships between personal wealth and entrepreneurship. See Hurst and Lusardi (2004), Adelino, Schoar and Severino (2015), Corradin and Popov (2015), and Schmalz, Sraer and Thesmar (2017).

4. Alternative Measures of Wealth Inequality

In this section, we return to the analysis of equation (1) and in Table VI we replace the Financial Wealth Gini with the Housing Wealth Gini, the No Mortgage Housing Wealth Gini, the Mortgaged Housing Wealth Gini and the Land Gini 1880. In all cases we report OLS and IV regressions.

The Housing Wealth Gini, as discussed before, is defined as the Gini coefficient of the distribution of wealth measured as home equity of houses purchased between 1999 and 2004 that do have a mortgage, and of houses that do not have a mortgage outstanding. Estimated coefficients are very similar to the ones reported before on the Financial Wealth Gini.

Given the two components of this definition we next replace it with either the No Mortgage Housing Wealth Gini which is defined as the Gini coefficient of the distribution of wealth measured as the home equity related to houses that do not have a mortgage, or the Mortgaged Housing Wealth Gini, which is the Gini coefficient of the distribution of wealth measured as home equity of houses purchased between 1999 and 2004 that do have a mortgage. In this way we assess if either one of these components would have a different impact on entrepreneurial outcomes.

Finally, as in Rajan and Ramcharan (2011) we use the Land Gini 1880 which is the Gini coefficient of the distribution of farm land in 1880 in the metropolitan statistical area (MSA). Results are once again most similar. In Appendix Table A.VII we also provide a full deck of exercises for the instrumented Land Gini 1880.

Our regressions control for the level and change of local house prices to make sure that neither the housing boom of the 2000s nor the subsequent crisis drive the results.[40] Similarly, Gini Land 1880 precedes and is independent from local economic conditions, thus alleviating concerns that our results may depend on the time period we study. To further explore this issue, we restrict the analysis to a different time period, between 1976 and 1990, and we regress local business formation on Land Gini 1880. We consider the period 1976-1990 in specific as it was not characterized by particularly bullish financial markets, like in the 1990s, or by a housing boom like in the first half of the 2000s. In unreported regressions, we still find that wealth inequality is negatively related to entrepreneurship. Moving from the 10th to the 90th percentile of Land Inequality reduces business formation of about 7 percent, a result fully in line with what we report in Table IV Column (7) for our main sample period.

5. *Wealth Inequality and Income Inequality*

In Table VII we add as a new independent variable (to the relevant specifications in Table III) an Earned Income Gini which is defined as the Gini coefficient of the distribution of income measured as the sum total wages and total profit and losses coming from entrepreneurial activities as reported in the IRS-SOI data.[41]

In Column (1) the Income Gini is featured by itself, in effect replacing the Financial Wealth Gini in our benchmark specification (from Table III Column (2)). Importantly for further discussions is that fielded by itself its estimated coefficient is positive but statistically insignificant. Next, we horserace wealth and income Ginis in Columns (2) to (6), starting with

[40] It also important to recall that the inclusion of year fixed effects controls for annual changes of the stock market index.
[41] In order to measure earned income we sum the information about salary, stipends and profit and losses (as reported in Schedule C and Schedule F) as reported by the IRS-SOI data.

the benchmark specification, then saturating further (with State*Year fixed effects) and investigating various firm dynamics as outcomes according to our previous lineup.

Results are very interesting. First, the estimated coefficients on the Financial Wealth Gini are as before negative and statistically and economically (similarly) significant. Second, the Earned Income Gini obtains a positive coefficient that is also economically relevant: a 10 to 90th percentile move in Income Gini increases establishment entry by 10.1 percent in the benchmark-related specification in Column (2) for example.

In sum, wealth inequality slows entrepreneurship while income inequality spurs it. The latter positive effect of income inequality would be consistent with "a supply side scenario" (Saez (2017)), whereby local possibilities to earn more (as reflected in recent local income distribution) incentivize people to work harder and create more companies. That wealth inequality slows entrepreneurship is salient *per se*, but even more so because a substantial part of recent increases in US wealth inequality were driven by large disparities in income (Piketty (2014)). To put differently, even when controlling for recent inequality income, wealth inequality slows entrepreneurship suggesting there is a strong permanent component in wealth inequality that drives entrepreneurship.[42]

6. Type of Establishment, Job Creation and Income Growth

Table VIII studies more in depth the characteristics of new establishment creation and relates them to local wealth inequality. Columns (1) and (2) look at the type of establishments created and in particular at the proportions of establishments, in the MSA, founded by already

[42] This interpretation is consistent with our estimates when instrumenting with the Homestead Act or past weather and soil conditions, or when using the Land Gini 1880, and with our investigation on local institutions as mediators. Our estimates also suggest that to address rising inequality (while preserving entrepreneurial dynamism), policy actions on wealth rather than income should be considered. In this respect our investigation of the impact of the changes in EIG taxes is also fitting.

existing firms.[43] Existing firms may have more financial capacity to support new businesses and more know how to overcome institutional constraints just because they build up experience and social networks. Our results reveal that in more unequal areas, there is a higher proportion of new establishment creation by firms already in operation. The economic effect is sizable: moving from the 10^{th} to 90^{th} percentile of financial wealth inequality leads to a 7 percent increase in the proportion of new establishments set up by existing firms.

Columns (3) and (4) look at the amount of job creation generated "at birth" by new establishments (normalized by MSA population). We find that in unequal MSAs new establishments create fewer jobs. Job creation at birth declines of about 10 percent when we move from the 10^{th} to the 90^{th} percentile of wealth inequality. This result goes hand in hand with our main result on business formation. We find that more unequal areas not only have less business formation, but new businesses also generate less employment.

Columns (5) and (6) assess whether more unequal areas also display a different pattern in income per capita growth. In the IV regression, we find that unequal MSAs have lower growth of income per capita. A movement from the 10^{th} to the 90^{th} percentile of Financial Wealth Gini reduces the growth rate of about 16 percent. This result suggests that lower business formation also translates in lower growth rates.

IV. An Investigation of the Channels: Wealth Inequality and Local Institutions

Our analysis so far has identified a reduced-form relationship between wealth inequality and business formation. This relationship could be mediated by factors related to the local

[43] We define a firm as "existing" if it has been in operation for at least five years according the Census data.

institutional environment. For instance, wealth inequality may result in an inefficient financial sector and yield restrictions to the supply of external finance, which, in turn, may prevent local business formation.[44] At the same time, an underfunded schooling system or a less efficient judicial system may simply discourage individuals from starting their own business.

We use data from the US Census and the Bureau of Justice Statistics to evaluate the relative importance of possible mediating factors that may underlie our results. We focus in particular on financial sector development, education, and the efficiency of the civil justice system. In uneven numbered columns in Table IX, we employ the benchmark specification from Table III Column (2) that includes state and year fixed effects and a comprehensive set of MSA controls. In even numbered columns we present the results from the second stage of the "usual" 2SLS IV regression.

In Columns (1) and (2) we field as a dependent variable the Amount of Venture Capital Investment per Capita. In both specifications we find a negative coefficient that is also economically very large. A movement from the 10^{th} to the 90^{th} percentile in the distribution of wealth inequality halves this amount.

In Columns (3) and (4) we focus on a measure of banking development; we follow Rajan and Ramcharan (2011) and use the number of bank establishments per 1,000 capita. Rajan and Ramcharan (2011) shows that, in the 1930s, US counties displaying more wealth inequality had a significantly lower number of bank establishments per capita. The results indicate that inequality indeed hampers banking development: the county inequality coefficient is negative and statistically significant in the OLS and marginally statistically

[44] Bank lending for instance can still be considered to be local, see amongst others (Gissler, Ramcharan and Yu (2018)).

significant in the IV analysis. The results are also economically meaningful: a movement from the 10^{th} to the 90^{th} percentile in the distribution of wealth inequality decreases the number of banks per 1,000 capita, for example, by 20 and 13 percent of its mean in Columns (3) and (4).

We then investigate if this deterioration in bank access leads to an overall reduction in lending to small businesses. In Columns (5) to (8), we find it does. We focus on both the total Number as well as the Amount of loans to small business per capita and in both cases we find that the coefficients on the Financial Wealth Gini are negative, statistically significant and economically relevant.

Turning to education as another institutional feature of the local environment, we present the results in Columns (9) to (12). The analysis shows that, in more unequal counties both the proportion of public school revenue coming from local sources and the school expenditures per pupil are lower. In fact, an increase in inequality from its 10^{th} to 90^{th} percentile decreases the proportion by 7 to 17 percent and the expenditures per pupil by 4 to 8 percent. Moreover, the population inflow of educated individuals (i.e., those with at least a college degree) is also lower in more unequal counties, as seen in Columns (13) and (14). A 10^{th} to 90^{th} percentile increase in inequality results in a significantly lower inflow of educated individuals. The economic effect is also sizable: a decrease between 48 and 72 percent evaluated at the mean of local inflow.

Finally, in Columns (15) and (16), we assess the effect of local wealth inequality on another local institution: the judiciary. We investigate how local inequality affects the judicial efficiency as measured by the length of time to the verdict for a first-degree civil trial. We obtain data on individual civil cases from the Bureau of Justice Statistics (BJS) from 2005.

The BJS reports data on civil litigations for the 75 most populous US counties which we aggregate at MSA level. At the individual case level, we observe whether the number of days (its natural logarithm) it takes to come to a verdict in a case is affected by local inequality.[45] We observe that local inequality matters for judicial decision making. When controlling for both state fixed effects and case controls (in the form of a set of dummy variables that controls for the nature of the case, such as breaching of a contract, intentional tort or partnership dispute), the findings suggest that, in more-unequal counties, court rulings take more time (19 to 30 percent more in our usual 10 to 90 assessment) and therefore are less efficient.[46]

Overall, we conclude that the results point in the direction that inequality also affects the quality of local institutions in the form of financial sector development, education and judicial efficiency.

We also run a formal analysis of the causality chain using the methodology developed by Becker and Woessmann (2009). We estimate a simultaneous equation model where in the first stage we relate wealth inequality to the proportion of land assigned via the Homestead Act in the MSA. In a second stage we regress the quality of local institutions on wealth inequality. In the third stage, we relate institutional quality to entrepreneurship. See Appendix B for details.

[45] We compute the number of days starting from the day when the case is filed until the day when a verdict is pronounced.

[46] Together with the dummies indicating the typology of the case and our standard sets of controls, the judicial efficiency regressions also include the number of plaintiffs and the number of defendants, whether the trial was a jury or a bench trial and whether the case was resolved with an arbitration as additional controls.

V. Conclusions

We empirically test hypotheses showing how household wealth inequality may determine entrepreneurial dynamism. The relationship between wealth inequality and entrepreneurship is not clear. On one hand, local wealth inequality may be associated with poorer institutions, discouraging entrepreneurs. On the other hand, inequality may help entrepreneurship by supporting local demand and generating more savings and investment.

In our empirical analysis, we employ multiple measures of wealth inequality at the US Metropolitan Statistical Area level. To alleviate endogeneity problems, we saturate specifications with comprehensive sets of local fixed effects and characteristics and estimate instrumental variable models relying on the 1862 Homestead Act or historical local weather and soil conditions to generate the instrument set. Additionally, we exploit the removal of Estate, Inheritance and Gift taxes in various states between the 1970s and 2000 in a difference-in-differences framework.

The estimated coefficients suggest that local-level wealth inequality robustly decreases firm creation and exit. The relationship between wealth inequality and entrepreneurial dynamism can be mediated by various factors. We find that, in more unequal locales, there is less venture capital investment, fewer bank establishments per capita, and less lending in general, all consistent with the existence of local credit rationing. We also find that, in more-unequal locales, local expenditures on schooling are lower and the inflow of individuals with at least a college degree slows down. Moreover, our findings also suggest the presence of a less effective judiciary in more-unequal MSAs. Additionally, we observe that higher inequality MSAs have fewer job created by new firms and lower personal income per capita growth.

Overall our findings suggest that inequality in local household wealth impedes entrepreneurial dynamism through the deterioration in local credit, schooling, and justice, and that to address rising inequality (while preserving entrepreneurial dynamism), policy actions focusing on wealth rather than income should be considered.

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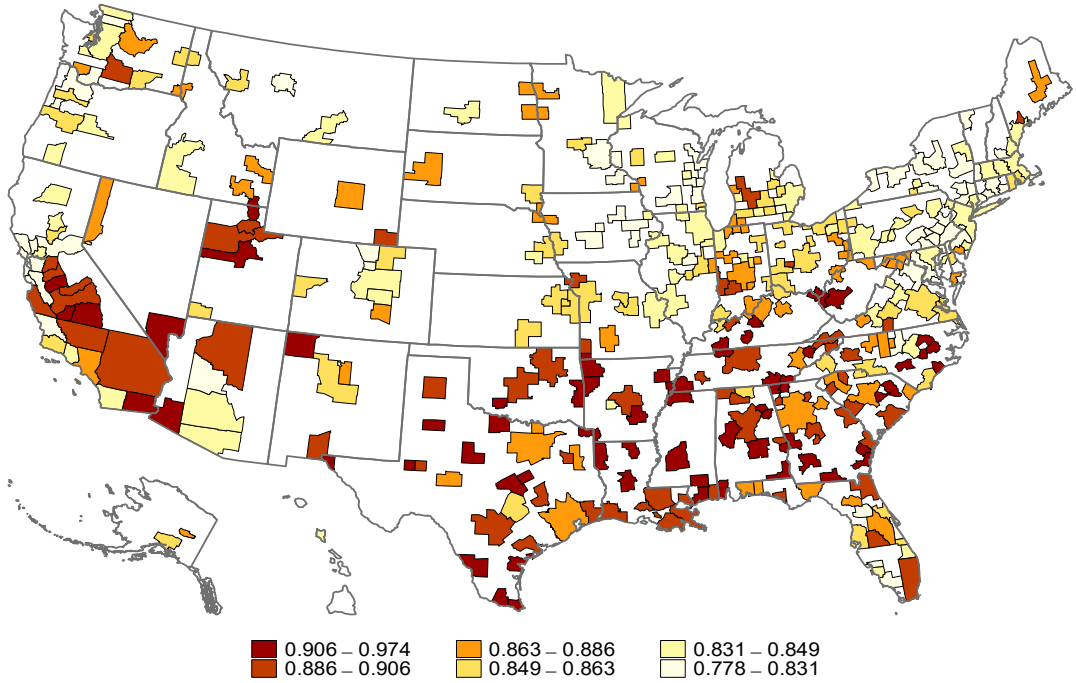
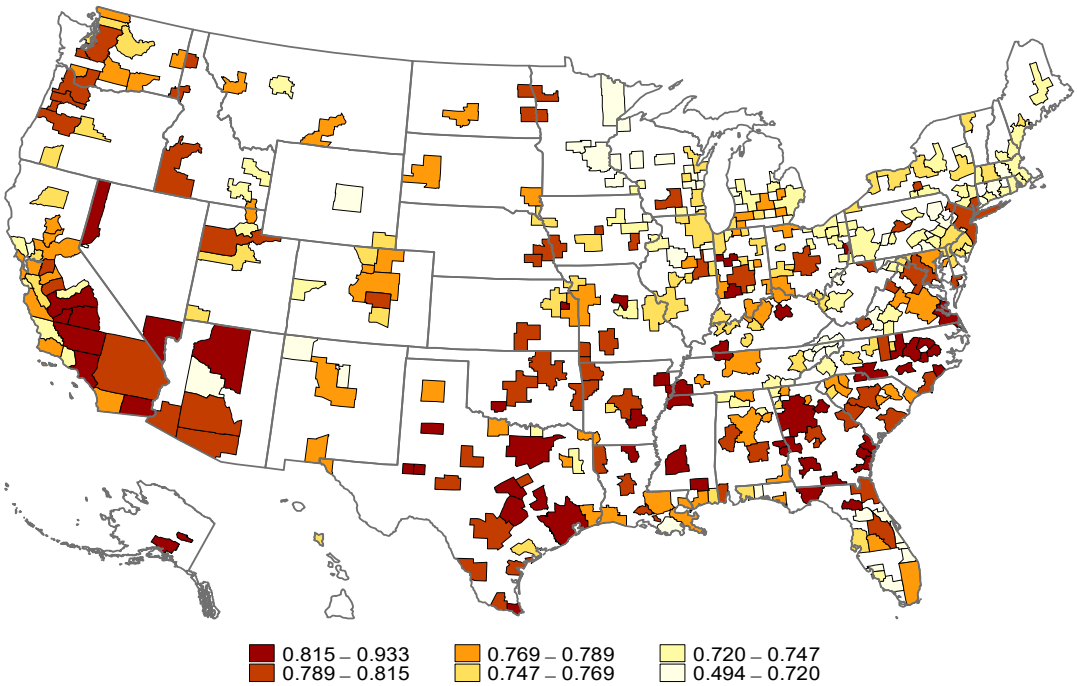
FIGURE 1
FINANCIAL AND HOUSING WEALTH INEQUALITY

Panel A. Financial Wealth Gini



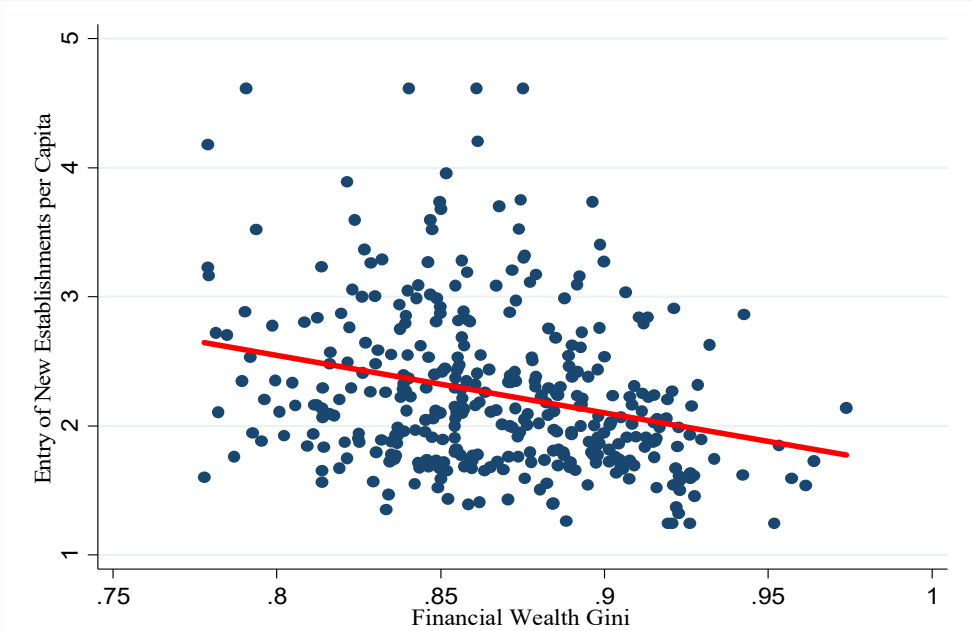
Panel B. No Mortgage Housing Wealth Gini



NOTES. The figure maps our measures of household wealth inequality across US metropolitan statistical areas. The Financial Wealth Gini is the Gini coefficient of the distribution of wealth as measured by the distribution of the amount of declared dividends from household tax filings in the metropolitan statistical area. The No Mortgage Housing Wealth Gini is the Gini coefficient of the distribution of wealth measured as the home equity related to houses that do not have a mortgage. A higher Gini (i.e., darker colored) corresponds to a higher degree of wealth inequality.

FIGURE 2
FINANCIAL AND HOUSING WEALTH INEQUALITY AND ENTRY OF NEW ESTABLISHMENTS

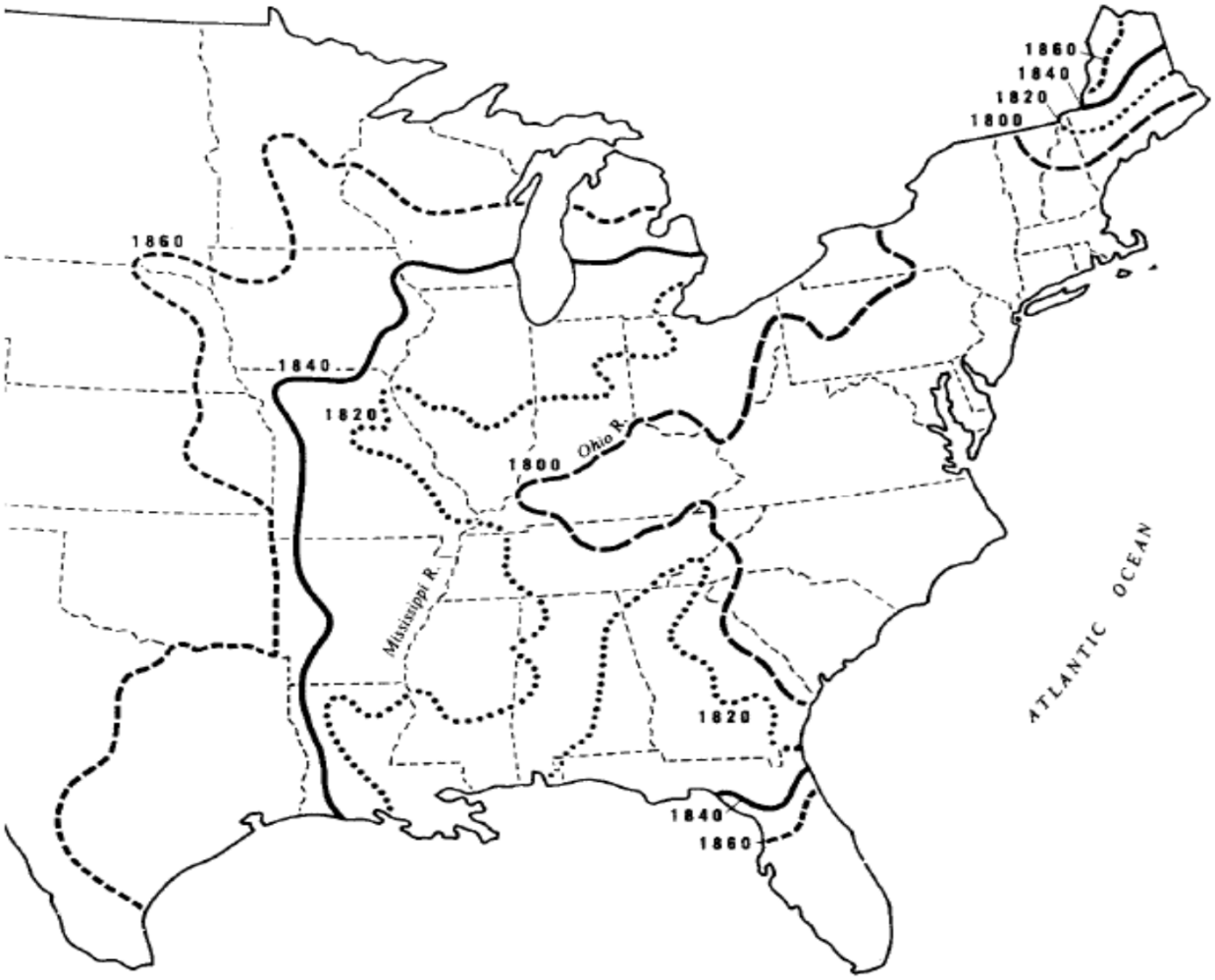
Panel A. Financial Wealth Gini



Panel B. No Mortgage Housing Wealth Gini

NOTES. The figure maps the entry of new establishments per capita versus our measures of household wealth inequality across US metropolitan statistical areas. Total Establishments Entry per Capita is the logarithm of the yearly total number of new establishments in the MSA between 2005-2012 divided by total MSA population. The Financial Wealth Gini is the Gini coefficient of the distribution of wealth as measured by the distribution of the amount of declared dividends from household tax filings in the metropolitan statistical area. The No Mortgage Housing Wealth Gini is the Gini coefficient of the distribution of wealth measured as the home equity related to houses that do not have a mortgage. A higher Gini (i.e., darker colored) corresponds to a higher degree of wealth inequality.

FIGURE 3
AMERICAN MOVING FRONTIER



SOURCE. Walton, Gary M. and Hugh Rockoff. History of American Economy. 11th edition. South-Western Cengage Learning. Page 134.

TABLE I

CORRELATION MATRIX - MAIN MEASURES OF INEQUALITY

		(1)	*(2)*	*(3)*	*(4)*	*(5)*
Financial Wealth Gini	*(1)*	1				
Housing Wealth Gini	*(2)*	0.476***	1			
Proportion of Financial Wealth Owned by the Top 10 Percent	*(3)*	0.646***	0.291***	1		
Proportion of Housing Wealth Owned by the Top 10 Percent	*(4)*	0.488***	0.951***	0.266***	1	
Land Gini 1880	*(5)*	0.371***	0.256***	0.269***	0.374***	1

NOTES. The definition of the variables can be found in Table A.I. ***, ** and * indicate significance at the 1%, 5% and 10% level respectively.

TABLE II
DESCRIPTIVE STATISTICS FOR THE EMPIRICAL ANALYSIS OF BUSINESS FORMATION, JOB CREATION, FINANCING AND INSTITUTIONS

Variable Name	Number of Observations	Units	Mean	Median	Standard Deviation	1th Percentile	99th Percentile
Dependent Variables							
Total Establishments Entry per Capita	3,276	-	2.27	2.12	0.86	1.07	4.79
Total Establishments Exit per Capita	3,276	-	1.38	1.32	0.43	0.74	2.61
Total Establishments Exit per Capita (Churning)	3,276	-	0.70	0.63	0.33	0.28	1.77
Total Establishments Exit per Capita (Schumpeterian)	3,276	-	0.68	0.68	0.28	0.00	1.41
Proportion of New Establishments Created by Existing Firms	3,276	-	0.30	0.30	0.06	0.17	0.46
Amount of Venture Capital Investment per Capita	1,092	1,000 USD	32.43	0.00	157.35	0.00	621.56
Job Creation at Birth (scaled by MSA Population)	3,276	-	0.018	0.017	0.008	0.006	0.042
Income per Capita Growth	2,800	Percent	3.10	3.60	3.50	-6.80	10.50
Banks Establishments per Capita	2,548	-	0.33	0.32	0.09	0.12	0.56
Total Number of Loans to Small Businesses per Capita	2,448	-	23	18	14	7	67
Total Amount of Loans to Small Businesses per Capita	2,448	USD	790	738	344	217	1794
Proportion of Public School Revenue Coming from Local Sources	3,222	-	0.41	0.40	0.13	0.13	0.72
School Expenditure per Pupil	3,222	USD	5570	5083	4990	3095	12378
Inflow of Individuals with at Least a College Degree	2,548	Thousands	678	56	2207	2	11756
Main Independent Variable							
Financial Wealth Gini	3,276	-	0.87	0.86	0.04	0.78	0.96
Housing Wealth Gini	3,276	-	0.77	0.77	0.05	0.59	0.86
No Mortgage Housing Wealth Gini	3,240	-	0.75	0.79	0.13	0.34	0.91
Mortgaged Housing Wealth Gini	3,213	-	0.77	0.77	0.05	0.64	0.86
Land Gini 1880	2,979	-	0.44	0.42	0.13	0.13	0.75
Proportion of Financial Wealth Owned by the Top 10 Percent	3,204	-	0.26	0.22	0.15	0.05	1.00
Proportion of Housing Wealth Owned by the Top 10 Percent	3,105	-	0.53	0.53	0.07	0.38	0.71
Other Measures of Inequality							
Income Inequality	3,204	-	0.53	0.53	0.02	0.49	0.57
Instrumental Variables							
Proportion of Land Assigned via Homestead Act	3,276	-	0.05	0.00	0.12	0.00	0.63

NOTES. The table provides the number of observations, mean, standard deviation, 1st percentile, the median (50th percentile) and the 99th percentile of all variables used in the empirical analysis. The definition of the variables can be found in Appendix Table A.I. For the sake of brevity we do not include MSA characteristics separately. Their corresponding descriptives can be found in Table A.II.

TABLE III
MAIN SPECIFICATIONS EXPLAINING BUSINESS FORMATION

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent Variable	*MSA Total Establishment Entries Per Capita*					*MSA Total Establishment Exits Per Capita*	*MSA Total Establishment Exits Per Capita (Churning)*	*MSA Total Establishment Exits Per Capita (Schumpeterian)*
		Benchmark						
Financial Wealth Gini	-2.226***	-2.518***	-2.439***	-2.327***	-2.069***	-1.986***	-2.018***	-2.202***
	(0.413)	(0.544)	(0.597)	(0.574)	(0.617)	(0.534)	(0.748)	(0.621)
MSA Percentage of Inhabitants living in Poverty	--	--	-0.167	-0.023	0.030	0.119	-0.140	0.710
	--	--	(0.448)	(0.433)	(0.477)	(0.457)	(0.527)	(0.580)
Whites to Total Population Ratio	--	--	--	0.323*	0.301	0.303	0.367*	0.203
	--	--	--	(0.194)	(0.208)	(0.188)	(0.214)	(0.209)
State Fixed Effects	No	Yes	Yes	Yes	--	--	--	--
Year Fixed Effects	No	Yes	Yes	Yes	--	--	--	--
State*Year Fixed Effects	No	No	No	No	Yes	Yes	Yes	Yes
MSA Controls	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	3,276	3,096	3,096	3,096	3,051	3,051	3,051	3,024
R-Squared	0.069	0.683	0.684	0.689	0.705	0.532	0.694	0.579
Economic Relevancy (Gini 10 to 90 %ile)	-19.9%	-22.2%	-21.6%	-20.7%	-18.7%	-18.0%	-18.2%	-19.7%

NOTES. All Models are estimated with a linear regression (OLS) model. The dependent variables are expressed in natural logarithms. MSA controls include MSA Estimated Total Wealth, MSA Catholic to Protestant Ratio, MSA Land Size, MSA Real GDP per Capita, MSA House Price Index (Level), MSA House Price Index (Change), Change in MSA Age Composition, and MSA Population Growth. "Yes" indicates that the set of fixed effects is included. "No" indicates that the set of fixed effects is not included. "--" indicates that the indicated set of characteristics or fixed effects are comprised in the wider included set of fixed effects. Estimated coefficients are reported in each first row with standard errors below (in parentheses) that are clustered at the MSA level. ***, ** and * indicate significance at the 1%, 5% and 10% level respectively.

TABLE IV
MAIN SPECIFICATIONS EXPLAINING BUSINESS FORMATION: INSTRUMENTED

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent Variable	*MSA Total Establishment Entries Per Capita*						
Sample / Specification				Excluding Dust Bowl States	Including Illiteracy	Excluding No Homesteading States	Georgia Land Lotteries
Financial Wealth Gini	-4.160***	-3.689**	-3.601**	-3.090**	-3.648**	-3.806***	-12.385*
	(1.516)	(1.454)	(1.470)	(1.437)	(1.601)	(1.442)	(7.263)
Railroad Line in the MSA in 1860		-0.049*	-0.047*	-0.040	-0.046*	-0.019	-0.672***
		(0.027)	(0.026)	(0.028)	(0.027)	(0.039)	(0.098)
Water Canal in the MSA in 1860		-0.030	-0.029	-0.030	-0.030	-0.037	-0.214**
		(0.027)	(0.027)	(0.030)	(0.025)	(0.035)	(0.101)
Native American Tribes in the MSA in 1860		0.006	0.007	-0.003	0.007	-0.006	0.260***
		(0.019)	(0.019)	(0.022)	(0.019)	(0.026)	(0.091)
Historical Farm Values			0.000	0.000	0.000	-0.000	-0.027
			(0.000)	(0.000)	(0.000)	(0.000)	(0.021)
Illiteracy					0.050	0.028	-4.272***
					(0.218)	(0.288)	(1.228)
Average Plot Size							-0.002***
							(0.000)
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MSA Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IV Coefficient First Stage	-0.064***	-0.066***	-0.066***	-0.079***	-0.061***	-0.069***	-0.011***
F-Statistic First Stage	10.056	11.290	11.503	14.830	10.614	13.760	15.028
Number of Observations	3,096	3,096	3,069	2,700	3,069	1,593	135
R-Squared	0.67	0.68	0.68	0.68	0.68	0.75	0.74
Economic Relevancy (Gini 10 to 90 %ile)	-14.8%	-13.4%	-13.1%	-11.4%	-13.1%	-16.0%	-34.6%

NOTES. All Models are estimated with a 2SLS estimator. The dependent variables are expressed in natural logarithms. MSA controls include MSA Estimated Total Wealth, MSA Catholic to Protestant Ratio, MSA Land Size, MSA Real GDP per Capita, MSA House Price Index (Level), MSA House Price Index (Change), Change in MSA Age Composition, and MSA Population Growth. "Yes" indicates that the set of fixed effects is included. "No" indicates that the set of fixed effects is not included. "--" indicates that the indicated set of characteristics or fixed effects are comprised in the wider included set of fixed effects. Estimated coefficients are reported in each first row with standard errors below (in parentheses) that are clustered at the MSA level for Models (1) - (6), and Huber-White Robust in Column (7). ***, ** and * indicate significance at the 1%, 5% and 10% level respectively.

TABLE V
DIFFERENCE-IN-DIFFERENCES ANALYSIS: STATE ELIMINATIONS OF ESTATE, INHERITANCE AND GIFT TAXES

Model	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	*Wealth Inequality at the State Level*		*ln(MSA Total Establishment Entries Per Capita)*		*ln(MSA Total Establishment Exits Per Capita)*	
Log of Number of Years since Reform	0.049**	0.051**	-0.030	-0.031*	-0.019***	-0.024***
	(0.022)	(0.025)	(0.020)	(0.019)	(0.006)	(0.009)
MSA Population Density	--	-0.002	--	-0.000	--	0.000**
	--	(0.002)	--	(0.000)	--	(0.000)
MSA Population Growth	--	0.979	--	4.616***	--	-7.192***
	--	(1.867)	--	(1.421)	--	(1.032)
MSA House Price Index (Level)	--	-0.000	--	0.003***	--	0.002***
	--	(0.001)	--	(0.000)	--	(0.000)
MSA House Price Index (Change)	--	-0.002*	--	0.006***	--	-0.008***
	--	(0.001)	--	(0.001)	--	(0.002)
Change in MSA Age Composition	--	4.564	--	-7.706***	--	-0.798
	--	(6.634)	--	(2.417)	--	(1.390)
Whites to Total Population Ratio	--	-1.184	--	1.732**	--	0.890
	--	(2.429)	--	(0.772)	--	(0.552)
State Fixed Effects	Yes	Yes	No	No	No	No
MSA Fixed Effects	No	No	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	182	182	8,736	5,688	8,736	5,688
R-Squared	0.45	0.47	0.85	0.899	0.805	0.818
Economic Relevancy (Between 1 and 2 Years Since Reform)	14%	15%	-3.0%	-3.1%	-1.9%	-2.4%

NOTES. All models are estimated with a linear regression model (OLS). The dependent variables in Columns (3) to (6) are expressed in natural logarithms. Number of Years since Reform indicates the total number of years that have passed after the EIG Reform was introduced in the state in which the MSA is located, with a maximum of 4 years. The definition of the variables can be found in Appendix Table A.I. t-1 indicates a one year lag. "Yes" indicates that the set of fixed effects is included. Estimated coefficients are reported in each first row with standard errors below (in parentheses) that are clustered at the state level. ***, ** and * indicate significance at the 1%, 5% and 10% level respectively.

TABLE VI
EXPLAINING BUSINESS FORMATION: OTHER INEQUALITY MEASURES

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent Variable	*MSA Total Establishment Entries Per Capita*							
Housing Wealth Gini	-1.135***	-2.814**	--	--	--	--	--	--
	(0.262)	(1.359)	--	--	--	--	--	--
GSE Gini	--	--	-1.398***	-3.903***	--	--	--	--
	--	--	(0.175)	(1.493)	--	--	--	--
Fully Owned Houses Gini	--	--	--	--	-0.939***	-2.631**	--	--
	--	--	--	--	(0.244)	(1.303)	--	--
Land Gini 1880	--	--	--	--	--	--	-0.233**	-1.263**
	--	--	--	--	--	--	(0.112)	(0.575)
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MSA Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F-Statistic First Stage	--	14.328	--	4.105	--	14.316	--	10.476
Number of Observations	3,096	3,069	3,096	3,069	3,096	3,069	2,853	2,853
R-Squared	0.67	0.644	0.712	0.544	0.666	0.637	0.642	0.585
Economic Relevancy (Gini 10 to 90 %ile)	-11.9%	-10.0%	-33.3%	-44.1%	-10.5%	-9.3%	-7.1%	-9.5%

NOTES. Models (1), (3), (5) and (7) are estimated with a linear regression (OLS) model. Models (2), (4), (6) and (8) are estimated with a 2SLS IV model. The dependent variables are expressed in natural logarithms. The definition of the variables can be found in Table A.I. MSA controls include MSA Estimated Total Wealth, MSA Catholic to Protestant Ratio, MSA Land Size, MSA Real GDP per Capita, MSA House Price Index (Level), MSA House Price Index (Change), Change in MSA Age Composition, and MSA Population Growth. The IV estimates in Columns (2), (4) and (6) also include Water Canal in the MSA in 1860, Indian Tribe in the MSA in 1960, Railroad Line in the MSA in 1860 and Historical Farm Value as additional controls. "Yes" indicates that the set of fixed effects is included. "--" indicates that the indicated set of characteristics or fixed effects are comprised in the wider included set of fixed effects. Estimated coefficients are reported in each first row with standard errors below (in parentheses) that are clustered at the MSA level. ***, ** and * indicate significance at the 1%, 5% and 10% level respectively.

TABLE VII
SPECIFICATIONS EXPLAINING BUSINESS FORMATION: WEALTH AND INCOME

Model	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	*MSA Total Establishment Entries Per Capita*			*MSA Total Establishment Exits Per Capita*	*MSA Total Establishment Exits Per Capita (Churning)*	*MSA Total Establishment Exits Per Capita (Schumpeterian)*
Financial Wealth Gini	--	-2.848***	-2.557***	-2.311***	-2.736***	-1.970***
	--	(0.433)	(0.465)	(0.468)	(0.513)	(0.611)
Earned Income Gini	1.081***	1.029***	0.998***	0.702**	1.088***	0.373
	(0.292)	(0.272)	(0.298)	(0.293)	(0.328)	(0.352)
State Fixed Effects	Yes	Yes	--	--	--	--
Year Fixed Effects	Yes	Yes	--	--	--	--
State*Year Fixed Effects	No	No	Yes	Yes	Yes	Yes
MSA Controls	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	3,060	3,060	3,015	3,015	3,015	2,989
R-Squared	0.662	0.704	0.721	0.551	0.713	0.593
Economic Relevancy (Gini 10 to 90 %ile) - Wealth		-24.7%	-22.5%	-20.6%	-23.9%	-17.8%
Economic Relevancy (Gini 10 to 90 %ile) - Income	10.6%	10.1%	9.7%	6.8%	10.7%	3.5%

NOTES. All Models are estimated with a linear regression (OLS) model. The dependent variables are expressed in natural logarithms. The definition of the variables can be found in Appendix Table A.I. MSA controls include MSA Estimated Total Wealth, MSA Catholic to Protestant Ratio, MSA Land Size, MSA Real GDP per Capita, MSA House Price Index (Level), MSA House Price Index (Change), Change in MSA Age Composition, and MSA Population Growth."Yes" indicates that the set of fixed effects is included. "No" indicates that the set of fixed effects is not included. "--" indicates that the indicated set of characteristics or fixed effects are comprised in the wider included set of fixed effects. Estimated coefficients are reported in each first row with standard errors below (in parentheses) that are clustered at the MSA level. ***, ** and * indicate significance at the 1%, 5% and 10% level respectively.

TABLE VIII
INEQUALITY AND OTHER OUTCOMES

Model	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	*Proportion of New Establishments Created by Existing Firms*		*Job Creation at Birth*		*Income per Capita Growth*	
Financial Wealth Gini	0.223***	0.507**	-0.020**	-0.047*	-0.013	-0.129*
	(0.076)	-0.209	(0.010)	(0.027)	(0.020)	(0.077)
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
MSA Controls	Yes	Yes	Yes	Yes	Yes	Yes
F-Statistic First Stage	--	11.04	--	11.50	--	11.00
Number of Observations	3,096	3,096	3,096	3,096	2,712	2,712
R-Squared	0.631	0.623	0.482	0.48	0.556	0.552
Economic Relevancy (Gini 10 to 90 %ile)	7.4%	6.4%	-11.0%	-10.0%	-4.0%	-16.5%

NOTES. Models (1), (3) and (5) are estimated with a linear regression (OLS) model. Models (2), (4) and (6) are estimated with a 2SLS IV model. The definition of the variables can be found in Appendix Table A.I. MSA controls include MSA Estimated Total Wealth, MSA Catholic to Protestant Ratio, MSA Land Size, MSA Real GDP per Capita, MSA House Price Index (Level), MSA House Price Index (Change), Change in MSA Age Composition, and MSA Population Growth. The IV estimates in Columns (2), and (4) also include Railroad Line in the MSA in 1860, Water Canal in the MSA in 1860, Native American Tribes in the MSA in 1860, and Historical Farm Value as additional controls. "Yes" indicates that the set of fixed effects is included. Estimated coefficients are reported in each first row with standard errors below (in parentheses) that are clustered at the MSA level. ***, ** and * indicate significance at the 1%, 5% and 10% level respectively.

TABLE IX

EXPLORING CHANNELS: MAIN SPECIFICATIONS EXPLAINING COUNTY BANK FINANCING SUPPLY, COUNTY EDUCATION, EDUCATED COUNTY POPULATION INFLOW AND CIVIL JUSTICE EFFICIENCY

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Financing Channels								
Dependent Variable	*Amount of Venture Capital Investment per Capita*		*No. of Bank Establishments per Capita*		*Total Number of Loans to Small Business per Capita*		*Total Amount of Loans to Small Business per Capita*	
Financial Wealth Gini	-13.820***	-18.072*	-2.187***	-3.510	-3.635***	-5.632***	-2.060***	-6.210*
	(3.697)	(9.916)	(0.506)	(2.189)	(0.434)	(1.742)	(0.684)	(3.363)
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MSA Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F-Statistic First Stage	--	12.54	--	10.762	--	11.473	--	11.473
Number of Observations	1032	1023	2408	2387	2335	2314	2335	2314
R-Squared	0.462	0.466	0.686	0.677	0.918	0.912	0.597	0.557
Economic Relevancy (Gini 10 to 90 %ile)	-74.8%	-49.9%	-19.6%	-12.6%	-30.4%	-19.4%	-18.6%	-21.1%

Model	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Panel B: Other Institutional Channels								
Dependent Variable	*Proportion of Public School Revenue Coming from Local Sources*		*School Expenditure per Pupil*		*Inflow of Individuals with at Least a College Degree*		*Judicial Efficiency*	
Financial Wealth Gini	-1.808***	-1.917**	-0.878***	-0.916	-12.860***	-17.522*	5.859***	5.625*
	(0.189)	(0.765)	(0.275)	(1.097)	(2.351)	(9.593)	(1.869)	(3.123)
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MSA Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F-Statistic First Stage	--	11.55	--	11.55	--	10.762	--	11.002
Number of Observations	3,066	3,039	3,066	3,039	2,408	2,387	2,417	2,417
R-Squared	0.769	0.764	0.648	0.642	0.812	0.817	0.309	0.309
Economic Relevancy (Gini 10 to 90 %ile)	-16.5%	-7.1%	-8.4%	-3.4%	-72.3%	-48.9%	19.2%	30.9%

NOTES. Models (2), (4), (6) and (8) are estimated with a 2SLS estimator; all other Models are estimated using OLS. The definition of the variables can be found in Appendix Table A.I. t-1. The definition of the variables can be found in Table A.I. MSA controls include MSA Estimated Total Wealth, MSA Catholic to Protestant Ratio, MSA Land Size, MSA Real GDP per Capita, MSA House Price Index (Level), MSA House Price Index (Change), Change in MSA Age Composition, and MSA Population Growth. The IV estimates in Columns (2), (4), (6) and (8) also include Railroad Line in the MSA in 1860, Water Canal in the MSA in 1860, Native American Tribes in the MSA in 1860, and Historical Farm Value as additional controls. "Yes" indicates that the set of fixed effects is included. "No" indicates that the set of fixed effects is not included. "--" indicates that the indicated set of characteristics or fixed effects are comprised in the wider included set of fixed effects. Estimated coefficients are reported in each first row with standard errors below (in parentheses) that are clustered at the MSA level. ***, ** and * indicate significance at the 1%, 5% and 10% level respectively.

INTERNET APPENDIX

A. Measuring Wealth Inequality

It is very difficult to readily obtain representative measures of wealth inequality at the local level. As a result we construct our own two proxies for local wealth inequality. The first one is based on current levels of financial wealth and broadly based on a methodology introduced by Mian, Rao and Sufi (2013) and Saez and Zucman (2016), and it intends to construct local level measures of household net worth; the second measure is based on US house ownership data.

The contemporary measure of wealth inequality looks at the amounts of dividends and interests earned by US households in 2004, the first year in our sample period, as reported by Internal Revenue Service (IRS) Statistics of Income (SOI) data. The IRS-SOI data report the total amount of dividends and interest income received by US households in a certain zip code. The information is reported as a total per zip code, but also divided in five households' income groups, ranging from low income to high income. Under the assumption that a typical household owns the market index for stocks and bonds, the amount of financial rents it receives depends only on the quantity of stocks and bonds it holds. IRS-SOI provides three pieces of information important to construct our proxy:

(1) The total number of households belonging to each income group;
(2) For each income group, the number of households who declared non-zero dividend and non-zero interest income (we will call these non-zero households); and,
(3) For each income group, the total amount of dividends and interests earned by all households.

We now report the procedure we adopted to construct our inequality proxy. For simplicity, we just describe the case where we consider only dividends as a financial rent. The procedure is exactly the same when we also include interest income and comprises six steps.

(1) We aggregate the IRS-SOI figures at a MSA level.
(2) For each MSA, we compute the number of households who declared zero dividend income and we place them into a separate category.
(3) For each MSA and each income group, we compute the average dividend earned by non-zero households. We do this by dividing the total amount of dividends for each income group by the respective number of non-zero households.
(4) We assume that each household in the same income group earned the average dividend computed in (2).
(5) We assume that each household owns the same type and composition of stock: the equity index. As a result, the amount of dividend received depends only on the quantity of stock owned.
(6) We use the number of non-zero households belonging to each income group, the number of households declaring zero dividends, and the average interests and dividend earned to compute a Gini coefficient that measures the distribution of dividend earnings within each MSA. Recall that the Gini coefficient is a measure of inequality that ranges between 0 and 1,

where a coefficient close to 0 can be interpreted as full equality, whereas a coefficient of 1 indicates perfect inequality. We perform the same procedure with the interest income data.[1]

Table A.III provides an example of this computation. Column 1 lists the five income groups, Column 2 provides the number of households belonging to each income group, Column 3 the number of households declaring a non-zero dividend, and Column 4 the sum of all dividends received by all households in each group.

First, we compute the number of zero-dividend earners by taking the difference between the total of Columns 1 and 2, which we report Column 4 in the row indicated as "Households with no Dividend Income". In the remainder of Column 4, we place the number of households that declared dividends, the same as in Column 2. We then compute the average dividend earned by non-zero households by dividing Column 3 by Column 4; we report this ratio in Column 5. We then compute the Gini coefficient, using the six dividend income groups. The first one consists of the 1,576,927 households that earned zero dividends, the second contains the 31,604 households that earn 1,181 dollars and up to the sixth group composed by 73,620 households that earn about 11,800 dollars in dividends. In this example, the Gini coefficient is equal to 0.91.

Naturally, this is a proxy, and it may be subject to measurement error. It performs well in identifying perfect equality and perfect inequality. In the former case, we would observe each household earning the same financial rents independently of the income group it belongs to, and our Gini coefficient would correctly have the value of zero. In the latter situation, our data would reveal all households but one receiving a financial rent and the Gini coefficient would correctly receive the score of one. The proxy does not work very well in every situation where in each income group, the distribution of dividends is very dispersed around the mean. In all these situations, we underestimate the degree of inequality. Measurement error may produce biased estimates of the coefficients when relating wealth inequality to financial outcomes. We will be able to alleviate this problem by instrumenting this wealth inequality measure in various specifications.[2] We will present our main results using a Gini coefficient based on dividends. Results are basically the same if we use a Gini coefficient based on interest income.

The second group of contemporary measures of wealth inequality are based on homeownership data obtained from both the US Census and Fannie Mae mortgage databases. From the US Census database, we obtain information on the amount of owner occupied housing units (i.e., households) that fully own their house as well as the corresponding value of the house. Housing values are labelled in one of the following categories: below $50,000; between $50,000 and $100,000; between $100,000 and $150,000; between $150,000 and 200,000; between $200,000 and $300,000; between $300,000 and $500,000 and a value of more than $500,000. Given that these properties are free of mortgage, the value of the houses corresponds to the household's housing equity. We use the lowest value of each bin to calculate a Gini index of housing inequality, which we label the No Mortgage Housing Gini. In the Gini index, we also include the number of households that rent a house, and we assume them as having zero housing wealth.

Notice that from the US Census database, we only have homeowners that fully own their house. In order to include homeowners that do have an outstanding mortgage, we rely on the Fannie Mae mortgage database ('Single Family Loan Level data set'), which provides us with information on mortgage originations between 1999 and 2004. The Fannie Mae data contains

[1] As we do not know the amount of dividends and interest income each individual household declares we cannot compute a unique Gini coefficient based on the sum of these amounts.

[2] Another possible source of measurement error may come from tax evasion. US financial institutions automatically report to the IRS dividends and interest income earned by their clients, making tax evasion through US banks virtually impossible. But taxpayers can avoid taxes by holding wealth at foreign banks.

information on the MSA where the property is located, the loan to value ratio at origination as well as the house value (again at origination). This information enables us to compute housing equity defined as the value of the house in 2004 minus the outstanding mortgage. Based upon this data, we calculate a Gini coefficient in similar spirit as the Gini measures based upon the housing information from the US Census ACS database. We compute our main housing Gini measure by aggregating the information on housing equity obtained from both the US Census and the Freddie Mac databases.

To construct our historical measure of wealth inequality, we obtain information on historical farm land sizes at the county level from the 1880 US Census. More precisely, for each county we have information on the total number of farms that – based upon their total acres of farm land – fall in a certain size bin. Farms are assigned to one of the following seven bins: under 10 acres, from 10 to 19 acres, 20 to 49 acres, 50 to 99 acres, 100 to 499 acres, 500 to 999 acres, and 1,000 or more acres.

First, we assume that the lower bound farm size of each bin is the average farm size of all the farms in this bin (for the first bin we set the lower bound equal to 0.001). We then aggregate the information at the MSA level. Next, we use these lower bounds to calculate a MSA Gini coefficient in a similar way as in Rajan and Ramcharan (2011).

We also compute proxies of the amount of financial and housing wealth held by the top 10 percent of wealthy owners. The data is not granular enough to precisely compute the exact top 10 percent: in principle, we would like to have individual tax records, but our data is aggregate at the income or house value level. The problem is slightly more complicated with the IRS-SOI data as it splits households in bins based on their total income and not on income coming just from dividends. While it is likely that households with high income may also have larger amounts of dividend earnings, the information we have does not allow us to precisely see it.

Keeping these caveats in mind, we now present the procedure we adopt to construct our top 10 percent financial wealth measure. We use the IRS-SOI data as discussed above. For each income bin, we compute the average dividend received by the corresponding households, which we define as the total amount of dividends reported in a certain income bin divided by the total number of returns reported in the same bin. We then rank bins in respect to the average dividend. We start with the bin with the highest average dividend amount and we compute the proportion of returns in this bin in respect to the total number of tax returns in the MSA. Once we complete this computation, we face three possibilities:

(1) If the proportion of returns is exactly equal to 10 percent, our procedure concludes here and we just compute the proportion of total dividends received by the households in the bin in respect to the total dividend amount reported in the entire MSA. This precisely corresponds to the amount of dividends/financial wealth held by the top 10 percent owners.

(2) If the proportion of returns is more than 10 percent, we compute the subset of tax returns within the bin that corresponds to the exact 10 percent of number of returns. We then multiply it by the average dividend amount earned in this bin and divide it by the total amount of dividend received in the MSA. This again provides us with the amount of dividends/financial wealth held by the top 10 percent owners.

(3) If the proportion of returns is less than 10 percent, we move to the bin with the second highest average dividend and we repeat the procedure again, until we reach the 10 percent of total tax returns delivered in the MSA.

The procedure we use to compute the 10 percent housing wealth is very similar to what we just described above; the only difference is that we rank each bin in relation to the corresponding housing value.

B. Some Evidence on the Direction of the Causality Chain

1. Quality of Local Institutions as Mediating Factor

Our analysis shows that local wealth inequality has a negative impact on local business formation. Additionally we find that local wealth inequality is negatively related to measures of quality of local institutions such as financial markets, schooling and the judiciary. A group of theories (Engerman and Sokoloff (1997), Glaeser, Scheinkman and Shleifer (2003), Sonin (2003), Berkowitz and Clay (2011), Perotti and von Thadden (2006), Rajan and Ramcharan (2011) and Acemoglu and Robinson (2013), pp. 152-158) predicts that local institutions can be mediating factors through which wealth inequality has an impact on economic development. For instance, wealth inequality may result in inefficient financial markets and yield restrictions on the supply of external finance, which, in turn, may prevent local business formation.

To assess whether local institutions are a mediating factor for the effect of wealth inequality on entrepreneurship, we first estimate the following equation:

$$Y_{j,t} = \alpha + \alpha_s + \alpha_t + \beta Wealth\ Inequality_j + \gamma Institutions_{j,t} + Controls_{j,t-1} + \varepsilon_{j,t} \quad ,$$

and horserace our measures of institutional quality with Wealth Inequality: a procedure similar to that performed by Becker and Woessmann (2009). If institutions are mediating factor through which inequality affects entrepreneurship, we would expect the coefficient on Wealth Inequality to become small and not statistically significant. We present the results in Table A.VIII. Indeed, when horseracing inequality with the measures of banking development and education to explain establishment turnover (Table VI), in 5 out of 6 specifications, inequality is robbed of all significance, suggesting that its impact flows mainly through institutional development.

To the best of our knowledge, the current literature does not provide us with estimates of the OLS bias of a regression that links institutional quality to business formation (or GDP growth). As a result, we are unable to perform a sensitivity analysis performed by Becker and Woessmann (2009) in order to obtain lower bounds for our OLS coefficients.

2. A Three Stage Model

In order to test more formally the causality chain implied by our argument, and again following the methodology of Becker and Woessmann (2009), we write a system of equations intended to spell out each component of the causality argument. In particular, we model Business Formation, Local institutional quality and Wealth inequality as follows:

$$MSA\ Business\ Entry_{j,t} = \alpha + \alpha_s + \alpha_t + \beta \widehat{Institutions}_{j,t} + Controls_{j,t-1} + \varepsilon_{1,j,t}$$

$$Institutions_{j,t} = \alpha + \alpha_s + \alpha_t + \beta \widehat{Wealth\ Inequality}_j + Controls_{j,t-1} + \varepsilon_{2,j,t}$$

$$Wealth\ Inequality_j = \alpha + \alpha_s + \alpha_t + \beta Homestead_j + Controls_{j,t-1} + \varepsilon_{3,j,t}$$

In the system of equations, the first stage predicts MSA wealth inequality based on the proportion of land assigned via the Homestead Act. The part of variation of the Wealth inequality related to the Homestead Act is then employed in the second stage to predict the level of local institutional quality. In the third stage, the fitted value of institutions is related to

the MSA number of new establishments per capita. This model is estimated using three stage least squares and the results are reported in Table A.IX As in the previous analysis, we restrict the analysis to the measures of institutional quality for which we have access to data for ae longer time series. We see that in the first stage, the proportion of land assigned via the Homestead Act is negatively associated with any measure of wealth inequality. In the second stage, with the exception of the total expenditure, the fitted value of inequality is negatively associated with institutional quality. Lastly, in the third stage, institutional quality has a positive association with local business formation.

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APPENDIX TABLE A.I
VARIABLE NAMES, DEFINITIONS, AND DATA SOURCES FOR THE EMPIRICAL ANALYSIS OF BUSINESS FORMATION, JOB CREATION, FINANCING AND INSTITUTIONS

Variable Name	Variable Definition	*Source*
Dependent Variables		
Total Establishments Entry per Capita	The logarithm of the yearly total number of new establishments in the MSA between 2005-2012 divided by total MSA population	*USC*
Total Establishments Exit per Capita	The logarithm of the yearly total number of establishments that became inactive in the MSA between 2005-2012 divided by total MSA population	*USC*
Total Establishments Exit per Capita (Churning)	The logarithm of the yearly total number of establishments that became inactive in the MSA within 36 months of opening between 2005-2012 divided by total MSA population	*USC*
Total Establishments Exit per Capita (Shumpeterian)	The logarithm of the yearly total number of establishments that became inactive in the MSA beyond 36 months of opening between 2005-2012 divided by total MSA population	*USC*
Proportion of New Establishments Created by Existing Firms	Number of new establishments created in the MSA by firms that have been active for at least 10 years divided by the total number of new establishmetns	*USC*
Amount of Venture Capital Investment per Capita	The total amount of venture capital invested in the MSA in 2015	*NVCA*
Job Creation at Birth	The number of jobs created by new establishments in the MSA divided by total MSA population	*USC*
Income per Capita Growth	The % Change of MSA Total Income per Capita	*USC*
Banks Establishments per Capita	The number of yearly bank establishments in the MSA divided by population	*USC*
Number of Loans to Small Businesses per Capita	The total number of loans made to small business in the MSA between 2005-2012	*FFIEC*
Amount of Loans to Small Businesses per Capita	The total amount of loans made to small businessess in $ in the MSA between 2005-2012	*FFIEC*
Proportion of Public School Revenue Coming from Local Sources	The ratio of yearly public school revenues obtained from local sources in the MSA divided by total public school revenues between 2005-2012	*USC*
Total Expenditure per Pupil	The total amount of yearly public school expenditures per pupil in the MSA between 2005-2012	*USC*
Inflow of Individuals with at Least a College Degree	Total number of individuals with a college degree or more moving in a county	*USC*
Main Independent Variables		
Financial Wealth Gini	The Gini coefficient of the distribution of wealth as measured by the distribution of the amount of declared dividends from household tax filings in the metropolitan statistical area (MSA)	*IRS*
Housing Wealth Gini	The Gini coefficient of the distribution of wealth measured as home equity of houses purchased between 1999 and 2004 that do have a mortgage and of houses that do not have a mortgage	*FRED/USC*
No Mortgage Housing Wealth Gini	The Gini coefficient of the distribution of wealth measured as the home equity related to houses that do not have a mortgage	*FRED*
Mortgaged Housing Wealth Gini	The Gini coefficient of the distribution of wealth measured as home equity of houses purchased between 1999 and 2004 that do have a mortgage	*USC*
Land Gini 1880	The Gini coefficient of the distribution of farm land in 1880 in the metropolitan statistical area (MSA)	*USC*
Instrumental Variables		
Homesteading in the First 10 Years of Incorporation of the MSA Area	Amount of land distributed via Homestead Acts between 1862 and 1872, if the MSA was already settled at the enactment of the Act, or in the first 10 years since first settlement, divided by the total amount of land distributed in the MSA	
MSA Average Rainfall between 1895 and 2003	The average district precipitation between 1895-2003, where a district is defined as a group of clustered counties with similar climatic conditions	*NCDC*
MSA Standard Deviation of Rainfall between 1895 and 2003	The standard deviation of district precipitation between 1895-2003, where a district is defined as a group of clustered counties with similar climatic conditions	*NCDC*
MSA Standard Deviation of Temperature between 1895 and 2003	The standard deviation of district temperature in degrees between 1895-2003, where a district is defined as a group of clustered counties with similar climatic conditions	*NCDC*
MSA Average Temperature between 1895 and 2003	The average district temperature in degrees between 1895-2003, where a district is defined as a group of clustered counties with similar climatic conditions	*NCDC*
MSA Soil Salinity	The salt concentration of the soil solution in terms electric conductivity (ECe) in dS/m in the MSA	*USDA*
MSA Soil Depth	The distance from the top of the soil to the base of the soil horizon in cm in the MSA	*USDA*
Control Variables		
MSA Characteristics		
Total MSA Estimated Wealth	Total housing wealth plust total financial wealth. Total Financial Wealth is proxied by the average dividend received by an individual in the MSA multiplied by the MSA population	*USC/IRS*
MSA Real GDP per Capita	The logarithm of one plus the real gross domestic product of the MSA during the year	*BEA*
MSA House Price Index (Level)	The yearly level of the House Price Index in the MSA based on the movement of single-family house prices	*FHFA*
MSA Population Density	MSA Population divided by total MSA area in square miles at year-end 2000	*USC*
MSA House Price Index (Change)	The yearly change in the House Price Index in the MSA based on the movement of single-family house prices compared to the previous year	*FHFA*
Water Canal in the MSA in 1860	= 1 if a water canal was present in the MSA in 1860, = 0 otherwise	*USC*
Native American Tribes in the MSA in 1860	=1 if there was at least one Native American tribe in the MSA in 1860, =0 otherwise	*USC*
Railway Line in the MSA in 1860	= 1 if a railway was present in the MSA in 1860, = 0 otherwise	*USC*
Historical Average Farm Value in the MSA	Average value of farmland and buildings per acre.	*USC*
Change in MSA age composition	Yearly % Change of the age composition in the MSA	*USC*
MSA Population Growth	Yearly % Change of the MSA population	*USC*
MSA Land Size	The logarithm of one plus the total MSA area in square miles at year-end 2000	*USC*
MSA Percentage of Inhabitants Living in Poverty		*USC*
Whites to total population ratio	Ratio of the total MSA population of white race at divided by the MSA total population	*USC*
Income Gini	The Gini coefficient of the distribution of income measured as the total household's income as reported in the IRS-SOI data	*IRS*
MSA Catholic to Protestant Ratio	Ratio of the total number of Catholics divided by the total number of Evangelicals in the MSA at year-end 2000	*ARDA*

NOTES. The table defines the variables used in the analysis. For the sake of brevity we do not report the MSA characteristics separately. Data sources include: ARDA = Association of Religion Data Archives; BEA = Bureau of Economic Analysis; FFIEC = Federal Financial Institutions Examination Council; FRED = Freddie Mac IRS = Internal Revenue Service; NCDC = National Climatic Data Center; NVCA = National Venture Capital Association; USDA = United States Department of Agriculture; USC = US Census.

TABLE A.II
DESCRIPTIVE STATISTICS MSA CONTROLS FOR THE EMPIRICAL ANALYSIS OF BUSINESS FORMATION, JOB CREATION, FINANCING AND INSTITUTIONS

Variable Name	Number of Observations	Units	Mean	Median	Standard Deviation	1th Percentile	99th Percentile
Soil Instrumental Variables							
MSA Average Rainfall between 1895 and 2003	3,240	Inch	3.17	3.30	1.11	0.72	5.25
MSA Standard Deviation of Rainfall between 1895 and 2003	3,240	-	1.93	1.83	0.68	0.66	4.10
MSA Standard Deviation of Temperature between 1895 and 2003	3,240	-	14.71	15.01	3.24	6.58	21.60
MSA Average Temperature between 1895 and 2003	3,240	°F	55.13	53.99	8.31	40.24	73.75
MSA Soil Salinity	3,177	ECe (dS/m)	0.53	0.01	1.04	0.00	4.86
MSA Soil Depth	3,186		88.97	89.31	11.84	60.87	112.10
Control Variables							
MSA Characteristics							
Total MSA Estimated Wealth	3,186	USD Million	47,410	14,970	105,500	3,364	510,200
MSA Real GDP per Capita	3,177	USD	41,502	39,517	11,551	20,581	78,170
MSA House Price Index (Level)	3,258	-	176.42	167.78	35.56	125.40	301.54
MSA House Price Index (Change)	3,258	-	1.94	1.13	15.34	-45.93	50.43
Water Canal in the MSA in 1860	3,276	0/1	0.52	1	0.50	0	1
Native American Tribes in the MSA in 1860	3,276	0/1	0.49	0	0.50	0	1
Railway Line in the MSA in 1860	3,276	0/1	0.46	0	0.50	0	1
Historical Farm Values	3,240	USD	67.99	51.19	67.34	8.50	372.72
Change in MSA Age Composition	3,276	-	0.00	0.00	0.00	0.00	0.01
MSA Population Density	3,276	-	277.39	191.27	292.32	1502.71	14.24
MSA Population Growth	3,276	-	0.01	0.01	0.01	-0.02	0.05
MSA Land Size	3,276	sq mi	2,459	1,629	2,895	252	14,566
MSA Percentage of Inhabitants Living in Povertry	3,276	Percentage	0.14	0.14	0.04	0.07	0.27
Whites to Total Population Ratio	3,276	-	0.83	0.86	0.12	0.51	0.98
MSA Catholic to Protestant Ratio	3,276	-	0.68	0.34	0.92	0.01	4.35

NOTES. The table provides the number of observations, mean, standard deviation, 1st percentile, the median (50th percentile) and the 99th percentile of all MSA control variables used in the empirical analysis as well as the instrumental variables based on MSA soil and weather characteristics. The definition of the variables can be found in Appendix Table A.I.

APPENDIX TABLE A.III

EXAMPLE MSA INEQUALITY 2004 - FINANCIAL RENTS GINI CONSTRUCTION

Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Income Group Category by Size of Adjusted Gross Income and Zip-Code	Total Number of Returns	Taxable Dividends Number of Returns	Taxable Dividends Total Amount Reported	Number of Returns	Average Dividend per Household	Taxable Interest Number of Returns	Taxable Interest Total Amount Reported
Total	1,882,964	306,037	1,287,291			651,013	1,189,469
Households with No Dividend Income			0	1,576,927	0.00		
Under $10,000	387,555	31,604	37,351	31,604	1.18	67,710	70,567
$10,000 under $25,000	553,957	42,503	64,756	42,503	1.52	114,076	150,519
$25,000 under $50,000	454,236	60,982	104,993	60,982	1.72	152,215	184,266
$50,000 under $75,000	231,139	55,051	113,500	55,051	2.06	123,892	156,056
$75,000 under 100,000	124,646	42,277	98,721	42,277	2.34	84,098	116,665
$100,000 or more	131,431	73,620	867,970	73,620	11.79	109,022	511,396

NOTES. The table provides an example of the data used to construct our *MSA Inequality Financial Rents Gini* measure from 2004. We obtain data from the SOI (Statement of Income) database from the IRS on the total number of tax returns in thousands (one per household) filed in 2004 classified by zipcode and the adjusted gross income as shown in Column (1). In addition we obtain information on the number of returns that declared to have obtained a dividend and the accompanying total dividend amounts reported (reported in thousands and thousands of US $), again classified by zipcode and the adjusted gross income of the household (shown in Columns (2) and (3) respectively). Based upon this data we calculate the average dividend amount per household reported for each income group in Column (5). The average dividend amount is reported in thousands of US $. We create an extra category of the number of households that did not declare any dividend (which is the total reports filed minus all reports that declared a dividend) which we report in the row 'Total', column (4) and (5) respectively. We use these average dividends as well as the income group classification to construct a Gini index, aggregating the zip code information to the corresponding MSA, in line with Rajan (2011). We create a second Gini coefficient in the same way, only now based upon the amount of interests received by households in 2004, as reported in Columns (6) and (7). Again, we obtain this information from the SOI database. The correlations between the Gini's based upon dividends and interest income received by households is very large and we therefore only report the results from our anlysis in which we introduce the county inequality measure based upon dividends received.

TABLE A.IV
HOMESTEADING AND FARM VALUES

Model	(1)	(2)	(3)
Dependent Variable	*Farm Values*		
Proportion of Land Distributed via Homestead Act	0.201	-0.076	-0.068
	(0.416)	(0.430)	(0.436)
Railroad Line in the MSA in 1860	0.243***	0.265***	0.147**
	(0.063)	(0.063)	(0.058)
Water Canal in the MSA in 1860	0.240***	0.263***	0.097*
	(0.060)	(0.060)	(0.056)
Native American Tribes in the MSA in 1860	0.030	0.009	0.098
	(0.063)	(0.063)	(0.061)
Illiteracy	-2.761***	-2.738***	-1.403***
	(0.204)	(0.204)	(0.483)
State Fixed Effects	No	No	Yes
Year Fixed Effects	No	Yes	Yes
Number of Observations	4,477	4,477	4,477
R-Squared	0.185	0.637	0.71
Economic Relevancy (Gini 10 to 90 %ile)	3.7%	-1.4%	-1.2%

NOTES. All Models are estimated with a linear regression (OLS) model. The dependent variable is expressed in natural logarithms. The definition of the variables can be found in Appendix Table A.I. t-1 indicates a one year lag. "Yes" indicates that the set of fixed effects is included. "No" indicates that the set of fixed effects is not included. Estimated coefficients are reported in each first row with standard errors below (in parentheses) that are clustered at the MSA level. ***, ** and * indicate significance at the 1%, 5% and 10% level respectively.

TABLE A.V
MAIN SPECIFICATIONS EXPLAINING BUSINESS FORMATION: HOUSING INEQUALITY - INSTRUMENTED

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent Variable	*MSA Total Establishment Entries Per Capita*						
Housing Wealth Gini	-3.325**	-2.867**	-2.814**	-2.819*	-2.827*	-3.432**	-1.139*
	(1.437)	(1.336)	(1.359)	(1.607)	(1.469)	(1.572)	(0.607)
Railroad Line in the MSA in 1860		-0.064*	-0.062*	-0.052	-0.062*	-0.024	-0.771***
		(0.034)	(0.033)	(0.034)	(0.033)	(0.053)	(0.071)
Water Canal in the MSA in 1860		-0.032	-0.031	-0.028	-0.032	-0.052	-0.367***
		(0.028)	(0.028)	(0.030)	(0.027)	(0.037)	(0.055)
Native American Tribes in the MSA in 1860		0.012	0.012	-0.002	0.012	-0.001	0.370***
		(0.022)	(0.022)	(0.026)	(0.022)	(0.034)	(0.061)
Historical Farm Values			0.000	0.000	0.000	-0.000	0.009**
			(0.000)	(0.000)	(0.000)	(0.000)	(0.004)
Illiteracy					0.018	-0.029	-1.981***
					(0.214)	(0.240)	(0.483)
Average Plot Size							-0.002***
							(0.000)
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MSA Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IV Coefficient First Stage	-0.080***	-0.085***	-0.085***	-0.087***	-0.079***	-0.077***	-0.12***
F-Statistic First Stage	13.65	14.33	14.33	12.41	13.56	12.75	759.47
Number of Observations	3,096	3,096	3,069	2,700	3,069	1,593	135
R-Squared	0.603	0.627	0.63	0.631	0.629	0.721	0.793
Economic Relevancy (Gini 10 to 90 %ile)	-11.7%	-10.5%	-10.3%	-11.5%	-10.1%	-15.4%	-8.4%

NOTES. All Models are estimated with a 2SLS IV model. The dependent variables are in log terms. The definition of the variables can be found in Appendix Table A.I. t-1 indicates a one year lag. "Yes" indicates that the set of fixed effects is included. Estimated coefficients are reported in each first row with standard errors below (in parentheses) that are clustered at the MSA level for Models (1) - (6). ***, ** and * indicate significance at the 1%, 5% and 10% level respectively.

TABLE A.VI
MAIN SPECIFICATIONS EXPLAINING BUSINESS FORMATION: INSTRUMENTED - SOIL AND WEATHER CHARACTERISTICS

Model		(1)	(2)	(3)	(4)
Dependent Variable	*First Stage Regression*	*MSA Total Establishment Entries Per Capita*		*MSA Total Establishment Exits Per Capita*	
Financial Wealth Gini		-5.810***	-5.591***	-5.934***	-5.633***
		(1.143)	(1.279)	(1.220)	(1.352)
MSA Average Rainfall between 1895 and 2003	0.014***				
	(0.005)				
MSA Standard Deviation of Rainfall between 1895 and 2003	-0.024***				
	(0.007)				
MSA Average Temperature between 1895 and 2003	0.001				
	(0.001)				
MSA Standard Deviation of Temperature between 1895 and 2003	0.004**				
	(0.002)				
MSA Soil Salinity	0.005***				
	(0.001)				
MSA Soil Depth	0.0006**				
	(0.0002)				
State Fixed Effects	Yes	Yes	--	--	--
Year Fixed Effects	Yes	Yes	--	--	--
State*Year Fixed Effects	No	No	Yes	No	Yes
MSA Controls	Yes	Yes	Yes	Yes	Yes
IV Coefficient First Stage					
F-Statistic First Stage		12.104	9.961	12.104	9.961
Number of Observations	3,006	3,006	2,970	3,006	2,970
R-Squared	0.728	0.633	0.656	0.388	0.437
Economic Relevancy (Gini 10 to 90 %ile)		-26.6%	-25.8%	-27.1%	-25.9%

NOTES. All Models are estimated with a 2SLS IV model. The dependent variables are expressed in natural logarithms. The definition of the variables can be found in Appendix Table A.I. t-1 indicates a one year lag. "Yes" indicates that the set of fixed effects is included. "No" indicates that the set of fixed effects is not included. "--" indicates that the indicated set of characteristics or fixed effects are comprised in the wider included set of fixed effects. "Yes" indicates that the set of fixed effects is included. "No" indicates that the set of fixed effects is not included. "--" indicates that the indicated set of characteristics or fixed effects are comprised in the wider included set of fixed effects. Estimated coefficients are reported in each first row with standard errors below (in parentheses) that are clustered at the MSA level. ***, ** and * indicate significance at the 1%, 5% and 10% level respectively.

TABLE A.VII
MAIN SPECIFICATIONS EXPLAINING BUSINESS FORMATION: LAND GINI 1880 - INSTRUMENTED

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent Variable	*MSA Total Establishment Entries Per Capita*						
Land Inequality 1880	-1.333**	-1.278**	-1.263**	-1.396**	-1.263**	-1.322**	-0.793*
	(0.537)	(0.573)	(0.575)	(0.605)	(0.628)	(0.588)	(0.425)
Railroad Line in the MSA in 1860		-0.040	-0.038	-0.039	-0.038	-0.009	-0.869***
		(0.030)	(0.030)	(0.033)	(0.031)	(0.041)	(0.086)
Water Canal in the MSA in 1860		0.025	0.026	0.034	0.026	0.036	-0.322***
		(0.041)	(0.041)	(0.045)	(0.039)	(0.042)	(0.054)
Native American Tribes in the MSA in 1860		-0.000	0.000	0.003	0.000	-0.019	0.426***
		(0.025)	(0.025)	(0.027)	(0.025)	(0.036)	(0.071)
Historical Farm Values			0.000	0.001	0.000	0.000	0.008*
			(0.000)	(0.001)	(0.000)	(0.000)	(0.005)
Illiteracy					-0.002	-0.189	-2.113***
					(0.238)	(0.259)	(0.493)
Average Plot Size							-0.003***
							(0.000)
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MSA Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IV Coefficient First Stage	-0.204***	-0.195***	-0.195***	-0.210***	-0.180***	-0.204***	-0.171***
F-Statistic First Stage	9.217	10.103	10.476	10.994	8.705	8.992	147.345
Number of Observations	2853	2853	2853	2529	2853	1386	135
R-Squared	0.570	0.580	0.585	0.580	0.585	0.710	0.780
Economic Relevancy (Gini 10 to 90 %ile)	-9.7%	-10.8%	-10.7%	-10.7%	-10.8%	-13.6%	-18.2%

NOTES. All Models are estimated with a 2SLS IV model. The dependent variables are in log terms. The definition of the variables can be found in Appendix Table A.I. t-1 indicates a one year lag. "Yes" indicates that the set of fixed effects is included. Estimated coefficients are reported in each first row with standard errors below (in parentheses) that are clustered at the MSA level for Models (1) - (6). ***, ** and * indicate significance at the 1%, 5% and 10% level respectively.

TABLE A.VIII
HORSERACE OF MEASURES OF INEQUALITY WITH INSTITUTIONAL QUALITY

Model	(1)	(2)	(3)	(4)	(5)	(6)
	MSA Total Establishment Entries Per Capita					
Financial Wealth Gini	-0.081	-0.853**				
	(0.390)	(0.433)				
Housing Wealth Gini			-0.036	-0.114		
			(0.168)	(0.194)		
Land Gini 1880					0.024	-0.025
					(0.080)	(0.081)
No. of Bank Establishments per Capita	0.203***	0.296***	0.202***	0.302***	0.198***	0.304***
	(0.033)	(0.042)	(0.034)	(0.041)	(0.036)	(0.046)
Total Number of Loans to Small Business per Capita	0.433***		0.435***		0.434***	0.099***
	(0.046)		(0.043)		(0.047)	(0.020)
Total Amount of Loans to Small Business per Capita		0.114***		0.114***		
		(0.019)		(0.020)		
Proportion of Public School Revenue Coming from Local Sources	0.302***	0.487***	0.310***	0.604***	0.323***	0.631***
	(0.076)	(0.090)	(0.073)	(0.085)	(0.083)	(0.099)
School Expenditure per Pupil	-0.012	-0.008	-0.011	-0.004	0.036	0.045
	(0.043)	(0.049)	(0.043)	(0.049)	(0.041)	(0.049)
Number of Observations	1,655	1,655	1,655	1,655	1,520	1,520
R-Squared	0.830	0.805	0.830	0.803	0.815	0.785
Economic Relevancy (Gini 10 to 90 %ile)	-0.8%	-8.2%	-0.4%	-1.3%	-0.8%	-0.8%

NOTES. All Models are estimated with a 2SLS IV model. The dependent variables are in log terms. The definition of the variables can be found in Appendix Table A.I. t-1 indicates a one year lag. "Yes" indicates that the set of fixed effects is included. Estimated coefficients are reported in each first row with standard errors below (in parentheses) that are clustered at the MSA level for Models (1) - (6). ***, ** and * indicate significance at the 1%, 5% and 10% level respectively.

TABLE A.IX
3SLS

	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
Stege 3	*MSA Total Establishment Entries Per Capita*					*MSA Total Establishment Entries Per Capita*					*MSA Total Establishment Entries Per Capita*				
No. of Bank Establishments per Capita	0.849**					0.841**					0.578***				
	(0.419)					(0.414)					(0.102)				
Total Number of Loans to Small Business per Capita		0.715***					0.714***					0.708***			
		(0.162)					(0.167)					(0.097)			
Total Amount of Loans to Small Business per Capita			0.672**					0.661**					0.426***		
			(0.294)					(0.295)					(0.078)		
Proportion of Public School Revenue Coming from Local Sources				2.234**					2.233**					1.131***	
				(0.965)					(0.963)					(0.262)	
School Expenditure per Pupil					3.508					3.835					-0.085
					(2.626)					(2.711)					(0.087)
Stage 2	*No. of Bank Establishments per Capita*	*Total Number of Loans to Small Business per Capita*	*Total Amount of Loans to Small Business per Capita*	*Proportion of Public School Revenue Coming from Local Sources*	*School Expenditure per Pupil*	*No. of Bank Establishments per Capita*	*Total Number of Loans to Small Business per Capita*	*Total Amount of Loans to Small Business per Capita*	*Proportion of Public School Revenue Coming from Local Sources*	*School Expenditure per Pupil*	*No. of Bank Establishments per Capita*	*Total Number of Loans to Small Business per Capita*	*Total Amount of Loans to Small Business per Capita*	*Proportion of Public School Revenue Coming from Local Sources*	*School Expenditure per Pupil*
Gini (Used in Stage 1)	-4.011*	-5.856***	-6.227*	-1.814**	-1.147	-3.284**	-4.644***	-5.010*	-1.478**	-0.862	-1.642**	-1.965***	-2.650**	-0.548**	-0.575
	(2.234)	(1.785)	(3.337)	(0.794)	(0.860)	(1.634)	(1.557)	(2.597)	(0.643)	(0.680)	(0.662)	(0.688)	(1.063)	(0.253)	(0.426)
Stage 1	*Financial Wealth Gini*					*Housing Wealth Gini*					*Land Gini 1880*				
Proportion of Land Assigned via Homestead Act	-0.063***	-0.063***	-0.063***	-0.063***	-0.063***	-0.077***	-0.077***	-0.077***	-0.077***	-0.077***	-0.208***	-0.208***	-0.207***	-0.203***	-0.198***
	(0.020)	(0.020)	(0.020)	(0.020)	(0.019)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.068)	(0.068)	(0.067)	(0.067)	(0.066)
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MSA Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	2,408	2,335	2,335	3,066	3,066	2,408	2,335	2,335	3,066	3,066	2,408	2,335	2,335	3,066	3,066