

DISSERTATION

TWO ESSAYS ON ENTREPRENEURSHIP, BANKRUPTCY AND EMPLOYMENT
CONCENTRATION, AND A DETOUR ON HOMELESSNESS

Submitted by

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ABSTRACT

TWO ESSAYS ON ENTREPRENEURSHIP, BANKRUPTCY AND EMPLOYMENT CONCENTRATION, AND A DETOUR ON HOMELESSNESS

This doctoral thesis is composed of two chapters that attempt to explain some of the causes for the decline of entrepreneurship in the United States since the late 1980s, and a third chapter the motivation for which arose while researching the other two. Chapter one looks at the laws protecting certain assets from repossession in the event of personal bankruptcy and their possible influence on entrepreneurship. As the US Supreme Court has repeatedly held that the *raison d'être* behind the bankruptcy statutes is to provide individuals with an unencumbered “fresh-start” in life, and that this is done both to promote entrepreneurship and for “humanitarian reasons”, it was only logical to follow up this chapter with another one exploring whether bankruptcy exemptions indeed offer some relief from destitution. This became the second chapter in this dissertation. Lastly, the third chapter circles back to the topic of entrepreneurship and looks at whether the concentration of economic activity (particularly employment) in larger enterprises, as is the case with the US labor market when compared to other OECD countries, has an effect on new business creation.

As stated, chapter one looks at how the changes in personal bankruptcy laws from 1986 to 2017 influence entrepreneurship. There are two components of the bankruptcy law explored in this section: its debt forgiveness or “fresh start” provision, and the protection from repossession that it extends to certain personal asset categories. The paper finds that the implementation of the

2005 BAPCPA law restricting access to debt discharge during bankruptcy was the most detrimental to entrepreneurship of the two, being strongly associated with a decrease in firm creation. Asset exemptions from repossession have an impact on entrepreneurship also, and larger (inflation adjusted) protections are paradoxically linked to fewer start-ups in general. However, this chapter also finds that immediately following a statutory increase in the exemption amounts there is a transitory rise in firm creation which only lasts for two years. The final verdict is that when it comes to personal bankruptcy law, it is debt forgiveness that encourages entrepreneurship; property protections offer at best a temporary boost to new firm creation but are in general detrimental to it. Alas, and since humanitarian reasons have historically and legally been recognized as a second premise for the US personal bankruptcy law, might asset protections during bankruptcy at least help in this regard?

The second chapter in this dissertation thus looks at the connection between the rate of homelessness in a state and the bankruptcy laws applicable to that state from 2007 to 2017. More generous homestead exemptions are surprisingly found to be associated with a significant increment in the rate of homelessness that is between 26 and 30 per 100,000 people. The wildcard exemption on the other hand (which can be used for any asset category) has an opposite effect: a one percent increment in its amount, when measured as a percentage of median household income, lowers homelessness by 219 to 230 individuals for every 100,000 people. Traditional economic indicators such as growth in per-capita Gross Domestic Product (GDP) have the foreseeable impact on homelessness, which is in fact not as strong as that of the asset protections: each one percent increase in GDP per-capita lowers homelessness by roughly 2 people per 100,000. Surprisingly, protections shielding filers from having their homes being taken away during bankruptcy are associated with increases in homelessness, whereas similar

safeguards applicable to any asset, although comparatively smaller in amount, are effective in reducing it.

The last chapter in this dissertation goes back to the topic of entrepreneurship, and explores the effect that workforce concentration in large employers, regardless of their nature, may have on new firm creation. As such the paper serves as a test of the ‘Chinitz’s hypothesis of agglomeration being the catalyst for local economic dynamics, and it is new in its approach in that it looks at total general employment in a given area (instead of focusing on particular industries), and because it takes into consideration the share of the workforce in large employers both in the private and the public sectors. The analysis uses economic and demographic data at the county level; given the possibility of feedback effects between the variables measuring the share of the workforce in large employers and the creation of new business, an instrumental variable approach is utilized for estimation. The findings in this last chapter confirm the Chinitz hypothesis, while also considering the effect of public sector employment on the private economy: concentration of the workforce in large employers, regardless of their nature, is determined to be a crucial driver for the local economy as it relates to entrepreneurship and is in fact deleterious to firm creation.

The evidence from these three essays suggests that bankruptcy debt forgiveness fosters entrepreneurship, but asset exemptions from repossession and employment concentration in large organizations negatively affect it. However, exemptions allowing a would-be filer to shield any item of their choice from repossession, even if they are modest in amount compared to other exemption categories, help in reducing homelessness. After all, people do need boots if they are to pull themselves up by their bootstraps, as Dr Martin Luther King once noted.

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INTRODUCTION

As a newcomer to the United States, it would be rare not to have your curiosity piqued by the multitude of characteristics that make America unique. First and most notable is, of course, size: new arrivals have been surprised by the scale of the U.S. since the time of the first settlers (Hennepin & Tonson, 1698). Oversize geography and fauna, large cities, expansive homes, and even the size of ordinary consumer items are common features of life in America, and this is true for U.S. businesses as well: from restaurants to health care providers, retailers and grocery outlets, hair salons, you name it: very large companies dominate the US economic landscape, and their share in the total workforce keeps getting larger¹.

A host of other surprises await the American transplant, and the entrepreneurial spirit that the country is known for is one of them. From high tech to everyday mundane activities, the newcomer is amused by the many small (and big) businesses that seem to mushroom from every corner on America from its people's garages, their vehicles, computers, cellphones, even from their pets!². It is also hard not to notice how tasks that in other places are handled by the public sector (i.e. servicing of court summons, public works, parking enforcement and towing, waste management and many others) are performed in America by private entrepreneurs. And yet, since the later 1980s, we witness a decline in new start-ups in the United States³. One wonders if the increased domination of large firms in the American economy may have to do with it.

¹ See Figure 3-1

² My neighbor offers "Private guided hikes with goats". Please contact: www.guidedgoathikes.com or GuidedGoatHikes@gmail.com.

³ See Figure 3-3

Next, and before pondering the relevance of this beyond that of an interesting curiosity, allow me to bring up one other unique characteristic of life in the U.S: although the country is strict with its citizens in the enforcement of its laws⁴, and it is comparatively thrifty in matters of social assistance⁵, America is unmatched in the guarantee and in the extent of relief that it offers to those who are financially troubled. A tradition of debt forgiveness dating back to the 1800s not only allows for the discharge of overwhelming debt, but also forestalls the total dispossession of material belongings thereby giving those who are down on their luck an opportunity to pull themselves up by the bootstraps: America always gives another chance. Could this be one of the reasons for its indomitable entrepreneurial spirit?

At the start of the second decade of the 21st century, sociological and economic dynamics are being impacted by tectonic shifts in the international political and trade arenas, by the emergence of a world pandemic, and by social tensions regarding issues of inequality, inclusiveness, immigration, poverty, and homelessness among many others. Regional economists analyze socio-economic factors that are geographically identifiable from a local to a global dimension in order to understand the disparity in economic prosperity and stability between regions, with the aim of guiding policy. They analyze how the variation in factors of production (such as access to human and physical capital, natural resources and land, and to technology and labor) and how institutional differences between regions contribute to disparate economic outcomes.

“Entrepreneurship”, as it refers to the creation and managing of a new activity that generates economic value, has long been identified as a factor in regional economic development and as a desirable outcome by itself. Structural economic conditions and institutions such as the legal

⁴-(World Prison Population List, 13th edition, 2021)

⁵ See Figure 2-1

environment of a region have an important role in shaping the components that enable the creation of new businesses. This dissertation focuses on two of these factors and takes a detour to explore some social implications (beyond the issue of entrepreneurship) that they can also give rise to. Chapter 1 investigates whether entrepreneurship is incentivized by bankruptcy debt forgiveness and asset protections laws, which mitigate the consequences of financial failure. This goal of promoting entrepreneurship is codified in the writing of the bankruptcy act, and since this legislation also highlights a humanitarian intent, chapter 2 focuses on its possible impact on the incidence of homelessness. In chapter 3 we return to the topic of entrepreneurship and explore whether it is affected by the concentration of employment in big organizations.

Risk is inherent to every entrepreneurial activity. Of course, one way to mitigate it is to incorporate the fledgling business so that its risk is disassociated from the personal wealth of the owner. But unless the new business venture is self-financed, no lending partner is going to provide funding for an enterprise without some degree of collateral, and this will be true regardless of the corporate status of the applicant. Therefore, and in as far as the entrepreneur may be asked to endorse the loan with their personal assets, bankruptcy protections that provide debt forgiveness and that prevent the requisition of all material possessions act as insurance for the prospect impresario. A neat theoretical model of this is presented in “Personal Bankruptcy and the Level of Entrepreneurial Activity” by Fan & White (2003). But of the two features of the bankruptcy act, debt forgiveness and personal asset protection, which is responsible for this insurance effect and to what degree?

Thus, for chapter 1, a novel and expansive dataset was collected from archival research covering the statutes, constitutions and case law for the 50 states, the federal government and the District of Columbia. This database spans the period from 1960 to 2017 (with differences in

coverage depending on the data available from each jurisdiction), and records every asset exemption category available to differently qualified individuals (married vs. non-married, retired, etc.) in each jurisdiction. Notably for our analysis, a new provision was added to the bankruptcy law in 2005 that limited the circumstances under which a private individual can obtain total debt discharge, and this is where chapter 1 contributes to the existing literature which does not consider this fact. By including an interaction term, our analysis is able to distinguish between impacts of the bankruptcy law on entrepreneurship that are related to the shielding of property assets versus those that are due to its debt forgiveness aspect. The results reveal that relief from debt is the feature of the law that promotes entrepreneurship, and that unexpectedly, the sheltering of personal assets from repossession has a detrimental effect overall.

But a general humanitarian purpose of the bankruptcy law has also been upheld by the Supreme Court of the United States⁶ and is recognized in the legal literature. Therefore, chapter 2 explores the impact that exemptions preventing the confiscation of the dwelling and of personal property from bankruptcy filers may have on homelessness. The chapter develops a simple dynamic model in which exemptions and economic conditions impact the rate of displacement at which the population “at risk” may slide into homelessness. Together with the rate of reestablishment that determines the speed at which people recover from a homeless state, the paper develops expressions for the evolution of homelessness and its steady state condition. The essay adds to the literature on homelessness because a link between asset protections from repossession and homelessness had never (to our knowledge) been explored before. Contrary to what might be

⁶ (Bruning v. United States, 1964) “The general humanitarian purpose of the Bankruptcy Act provides no reason to believe that Congress had a different intention with regard to personal liability for the interest on such debts”.

expected, protections that shelter people from having their homes taken away during bankruptcy do not diminish, but instead increase, the rate of homelessness in a state. On the other hand, the much meager wildcard exemption, which can be used to protect any belongings of the filer, is strongly associated with a considerable decrease in the homelessness rate.

Lastly chapter three returns to the study of entrepreneurship, looking at how it might be affected by the dominance of large firms in the labor market. This is in fact a test of the Chinitz hypothesis of agglomeration and firm size being the determining factor in the structure of local economics, entrepreneurship in particular. The paper adds to the understanding in the field because besides considering the total level of employment in large organizations regardless of the industry in which it happens, it also takes into consideration employment in the public sector which studies on entrepreneurship and private employment often ignore. The empirical environment of the study covers all the counties in the U.S. from 1995 to 2019, and since an index does not exist for meaningful comparisons of prices at the county level, the paper builds one based on the Housing Price Index cross-referenced by Zillow's Home Value Index.

An instrumental variable is used in order to avoid biases in the estimation resulting from possible endogeneity between the variable measuring entrepreneurship and the one controlling for the share of employment by large companies. The findings show that entrepreneurship is in fact negatively impacted by the concentration of employment in large organizations: whether they are public or private and regardless of the industry they are in, large employers crowd out entrepreneurs at the local level.

Chapter 1: The Role of Personal Bankruptcy Protections on Entrepreneurship: Cushion v. Forgiveness

Synopsis:

This chapter looks at the relationship between entrepreneurship, as measured by the number of new firms per population, and the bankruptcy laws from 1986 to 2014. It finds that the most important impact on entrepreneurship has been the passage of the 2005 BAPCPA, which restricted access to bankruptcy discharge and is associated with a decline in the number of new firm's starts. Bankruptcy asset protections also play a role, and more generous exemptions are associated with fewer start-ups. However statutory exemption increases positively impact new firm generation for up to two years after the change. The conclusion is that debt forgiveness (and not property protections) is the feature of the bankruptcy law that fosters entrepreneurship.

1.1 Introduction: Overview and History of Bankruptcy Law in The United States

It is well known that in the United States, startups have the highest rate of job creation of all firms (Goetz & Stinson, 2022). America is famous for its entrepreneurial spirit, and the ideas, technological change and dynamism that it gives rise to have always been a defining characteristic of American society and of its economy. Also, unique to the United States is a Bankruptcy Act that offers prospect troubled debtors a level of relief unparalleled when compared to what is available in other national jurisdictions. This paper is a study of the impact that personal bankruptcy relief laws may have on the level of entrepreneurship, by trying to quantify the effect of such laws on the number of new business startups for the fifty U.S. States and the District of Columbia from the mid-1980s to 2014.

1.1.1 The United States Bankruptcy Law

The United States Congress has the constitutional power to “to establish... uniform Laws on the subject of Bankruptcies throughout the United States” (U.S. Const. art. I, § 8 cl. 4, 1787). Each of the colonies had regulated insolvency and bankruptcy pre-ratification, and in fact these affairs were still governed by the states until 1800, when the first federal Bankruptcy Act was passed (Congress, n.d.). However, as we will see, Congress has in recent times devolved part of this authority back to the states and this provides an opportunity to explore how different implementations of the law can impact economic and social dynamics. Current bankruptcy procedures in the United States are governed by Title 11 of the U.S. Code (1978)⁷ as amended⁸. The law, which is commonly referred to as “The Bankruptcy Reform Act of 1978”, did not become effective until October 1st, 1979, and it is the last in a long-standing tradition of debt forgiveness dating back to the early 19th century in America. Of note is the fact that voluntary petition for bankruptcy by individuals (as opposed to enterprises) was a feature of the Bankruptcy Act as early as 1841, although it has been repealed and reinstated several times in history. Voluntary initiation of bankruptcy proceedings by private individuals is now a central aspect of the 1978 law (Hallinan, 1986).

Different chapters of the 1978 law currently in effect codify different avenues for bankruptcy resolution available to a troubled debtor. Chapter seven, the focus of our study, is the path towards total debt discharge for the private individual filer. This discharge is reached only after

⁷ <https://www.govinfo.gov/content/pkg/USCODE-2018-title11/pdf/USCODE-2018-title11.pdf>

⁸ Amendments are: Bankruptcy Amendments and Federal Judgeship Act of 1984, the Bankruptcy Judges, United States Trustees and Farmer Act of 1986, and the Bankruptcy Abuse Prevention and Consumer Protection Act of 2005.

the debtor's assets are liquidated to satisfy as much of the creditor's claims as possible, within a timeframe of three to six months. Immediately after a chapter seven filing an "automatic stay" is enforced by the court; this stops debt collections, and forces creditors to go through the court for recourse instead of contacting the debtor. The court then nominates a trustee, who oversees the liquidation of assets and their distribution to the creditors, but some individual belongings are shielded from this liquidation process and the bankruptcy filer is allowed to keep them all the while having their debts discharged. These are commonly referred to as bankruptcy "exemptions", and as we shall see, they vary by state. A different avenue for debt resolution available to the private citizen (and which is not the subject of this paper) is the filing of bankruptcy under Title 13 of the law. This provision simply regulates negotiation with creditors for re-structuring of terms for the satisfaction of liabilities.

Personal bankruptcy is not an uncommon phenomenon: according to the American Bankruptcy Institute, there were 751,186 personal bankruptcy cases in the United States in the year 2018. This amounts to 2.3 personal bankruptcies per 1000 people or 3.5 per thousand individuals of age 25 or older, of which 461,897 or 61.49% were Chapter 7 filings⁹. Bankruptcy filings were their highest in 2005 at 2,039,214, and they have been steadily declining since the Bankruptcy Abuse Prevention and Consumer Protection Act went into effect in October 2005. Regarding the exemptions available to a filer, previous enactments of the bankruptcy law have differed in how these were implemented: the newly created federal exemptions in the 1841 Act had to be used by all bankruptcy filers, whereas the 1898 Act only allowed a debtor to claim exemptions available under State law. The current 1978 law is different: although it establishes a set of bankruptcy

⁹ https://abi-org.s3.amazonaws.com/Newsroom/Bankruptcy_Statistics/Total-Business-Consumer1980-Present.pdf

exemptions, it allows states to also enact their own to be used in conjunction, or to altogether disavow the Federal ones if they so decide. The latter course is commonly known as the “opt-out” provision of the bankruptcy law.

In 1980, one year after the 1978 Bankruptcy Act went to effect, Georgia became the first State to “opt-out” of the Federal exemptions (Ponoroff, 2014), and two thirds of States had done the same by the early eighties (Hynes, 2004). This is significant for us because as already stated; our goal is to gauge the effect that the generosity of the bankruptcy exemptions may have on entrepreneurship. To distinguish it from other confounding factors, it is important to focus on a time period for which there are no other structural differences in the bankruptcy law, and thus we will use data from 1985 until 2014 during which aside from changes in exemptions, the law remained relatively unchanged (except for one crucial factor that we discuss next).

A considerable modification to the 1978 Bankruptcy Act was brought about by the 2005 Bankruptcy Abuse Prevention and Consumer Protection Act (BAPCPA) enacted by [Pub.L. 109–8](#), 119 [Stat. 23](#) on April 20, (although most of its provisions did not go in effect until after October 17, 2005). The aim of the legislation was to make it more difficult to file for a discharge Chapter 7 bankruptcy in the belief that “individuals who file for bankruptcy should be required to pay back some of their debts if they have the means to do so” (Committee on the Judiciary, 2005)¹⁰. Towards this end, BAPCPA established a “means test” that debtors with incomes above their state’s average had to satisfy in order to be able to file for Chapter 7, or else be directed towards Chapter 13 filing. BAPCPA also requires credit counseling and debt education for

¹⁰ Sen. Chuck Grassley’s opening statement at the Bankruptcy Reform Hearing of Feb 10, 2005. <https://www.grassley.senate.gov/news/news-releases/opening-statement-sen-chuck-grassley-bankruptcy-reform-hearing>

debtors who file for Chapter 7, and makes filing more difficult for those who mainly have “consumer debt”. Other preconditions added by BAPCPA are that: it establishes a waiting period for repeated filers, it puts limits on the homestead exemption if the home has been acquired fewer than 40 months before the petition, and it requires 730 days of residence in a state before claiming the exemptions available in such state. Since waiting period exemption qualifiers were already in place in many State statutes, arguably the most important characteristic of the law is that it restricts the access to a Chapter 7 discharge and makes it more difficult to obtain.

As we just reviewed, the 2005 BAPCPA is a significant amendment to the 1978 Bankruptcy Reform Act, and thus it becomes necessary to control for its possible effects in any study that attempts to explore the repercussions of the current bankruptcy legislation. The possibility exists that these effects may be different pre and post-2006 (which is when BAPCPA went into effect). This has not been accounted for in previous studies, and so we will be mindful in our analysis to make a distinction between both periods.

1.2 Literature Review on Bankruptcy and Entrepreneurship

1.2.1 Entrepreneurship as Raison D’être for the Bankruptcy Law’s Fresh Start Provision

The United States is rare among other industrialized OECD countries in that since practically its foundation, an established legal recourse has existed for the discharge of debts by an overburdened private individual. An automatic debt pardon to an insolvent debtor is provided by law in a handful of other countries: England, Scotland, Canada, Australia, Hong Kong, New Zealand, Taiwan, the Netherlands and Russia (Efrat, The evolution of bankruptcy stigma, 2006). But the bankruptcy code of the US is unique in that in addition to certain, expedient and

comprehensive debt forgiveness, it contains other measures to facilitate an unencumbered new beginning to the debtor, which is aptly referred to as a “fresh start”.

Note that although the aforementioned countries do have provisions for automatic debt forgiveness to the bankrupt, all of them severely limit not only the debtor’s future access to funding, but also their ability to participate in many commercial and public service activities. Furthermore, the bankruptcy process takes years until a final discharge is reached, and during that time the income of the petitioner is part of the bankruptcy estate.

In the US, bankruptcy law provides an automatic and swift post-petition stay on all outstanding debts, it forbids discrimination against the petitioner in matters of employment and professional certification, and –most importantly for us- contains generous exemptions to shield from repossession certain assets that are deemed essential for a debtor to start anew. In contrast to other countries the US bankruptcy system does not have a punitive slant and instead is geared towards facilitating a “fresh start”. Indeed this “fresh start” is the main purpose of the Bankruptcy Act, as repeatedly upheld by the Supreme Court of the U.S. (SCOTUS). Decisions from the SCOTUS often refer back to language from *Stellwager v Clum* (1918):

“The federal system of bankruptcy [has] as a main purpose ... to aid the unfortunate debtor by giving him a fresh start in life, free from debts.” “Our decisions lay great stress upon this feature of the law -- as one not only of private, but of great public interest in that it secures to the unfortunate debtor ... a new opportunity in life.”

Local Loan v. Hunt (1934) ties this public interest in debt discharge to the fact that it opens a “clear field for future effort” to the petitioner, thus infusing the intent of the law with an

efficiency restoring goal as it allows for the human capital of the petitioner to continue to be productive to society.

But even more significant for the public interest of a capitalist society is the view that the fresh-start policy encourages the undertaking of socially beneficial entrepreneurial effort, and the taking on risky ventures that are productive in nature (Hallinan, 1986). During the 19th century, the role of credit in economic growth increases via an expansion in the social and economic importance of the entrepreneurial and business sectors. Therefore, the measured taking on debt and business risk is viewed as the driver of a productive economy, and there is an acceptance that failure stemming from circumstances out of the debtor's control may be par for the course (Hallinan, 1986). Viewed in this context, the fresh-start feature of the bankruptcy law constitutes a social insurance that provides the would-be entrepreneur with a back-stop should misfortune befall (Weisberg, 1986). Thus the 'fresh-start' motive of the bankruptcy law is historically rooted in a desire to promote entrepreneurship and to develop a mercantilist society, and although of course many other considerations such as humanitarian factors and the "debtor cooperation theory" for the orderly discharge of debts are also goals of the law, this economic efficiency promoting slant is the most prevalent in academic and in Supreme Court writings.

1.2.2 Exemptions as Necessity for a Fresh Start from Bankruptcy

Bankruptcy exemptions are protections stipulated in either state bankruptcy statutes, state constitutions or the Federal bankruptcy code, that specify certain items that the bankruptcy petitioner can keep and protect from repossession and that are out of the reach of creditors.

The language of the 1978 Bankruptcy Act puts emphasis on the fact that exemptions are necessary for a fresh start. Academics have offered interpretations as to why this is so. A common view is that some material goods and implements of trade are necessary if a debtor is to re-start a productive life after judgement. It is thus that most state exemptions include provisions for cooking implements, clothing, and specially tools of the trade, so that human capital does not go to waste for lack of the minimum physical capital to put it to use (Whitford, 1979). The discharge from debt and the protection from total material dispossession are viewed as the two main features in the Bankruptcy Act that make it possible for an individual to return to productive life (Gross, 1986).

As a curious observation, it is impossible not to notice in looking at the different state exemption levels how virtually all states and the federal bankruptcy statutes include motor-vehicle exemptions in their codes. Surveys from the Pew Research Center¹¹ make clear how since 1973, 91% of the American public views the automobile as a necessity of life. Of course, this is not the case for motor vehicles of a recreational nature such as motorcycles, snowmobiles or ATVs, which rarely if at all are observed in the exemption statutes¹². This underscores the role of bankruptcy exemptions as a way of preserving a minimum of physical capital necessary to return to productive life.

In summary, we have ascertained that the Supreme Court (and legal scholars) has historically established that the main purpose of exemptions in the bankruptcy law is to ensure the feasibility

¹¹ Luxury or Necessity the Public Makes a U Turn
<https://www.pewsocialtrends.org/2009/04/23/luxury-or-necessity-the-public-makes-a-u-turn/>

¹² Texas being a notable exception as it exempts some two and three-wheeled recreational vehicles from repossession: [Tex. Prop. Code § 42.002 \(a\)\(9\)](#).

of a fresh start in order to foster entrepreneurship for the benefit of economic efficiency.

Therefore, we ask ourselves: does the generosity of the bankruptcy exemptions really have an impact on the level of entrepreneurial activity? Or is it the fresh-start provision of the law that makes a difference? As already stated, this is the main impetus of this paper.

1.2.3 The Importance of Entrepreneurship in the Economics Literature.

To understand the economic importance of entrepreneurship beyond its direct impact on job creation, it is useful to review the literature on economic growth and to explore how entrepreneurship fits into the machinery of internally driven economic development.

The theory of endogenous growth arose in the 1980s with the idea that internally driven technological improvement explains the wealth gap disparity between advanced and developing economies, which was in contrast with neoclassical thinking. Previous growth theory had characterized economic growth as the result of an exogenous process of accumulation of physical capital, human capital, labor and technology. As it was assumed that physical and human capital were subject to diminishing returns which would lead economies to converge as they accumulated these factors of production, technological growth was left as the only factor that would explain continuous growth disparities (Solow 1956, 1957). However, the source of this growth is neither identified nor explained in the neoclassical theory, where it was modeled as an exogenous contributor.

Since the advent of the literature on endogenous growth knowledge driven innovation is identified as the principal component of human-capital spurred growth (Romer, 1986), (Lucas, 1988). This knowledge arises from spillovers and externalities in the production process and so it is endogenously determined, thus providing an explanation for the source of technological

improvement which was left unexplained in the neoclassical theory. From the theoretical angle, it is Zoltan Acs et. al (2008, 2010) who model entrepreneurship as the link between technological knowledge and growth within an endogenous growth model which exhibits spillovers from human capital. Knowledge created through R&D creates innovation externalities that originate new opportunities for the entrepreneur. Zoltan's model shows that economic growth is increasing in higher levels and efficiency of entrepreneurship. This highlights the importance of entrepreneurship and anchors its role in the understanding of economic growth. Bunten, Weiler et al. (2014) also show that entrepreneurship contributes to regional growth because the success and failure of new firms provides valuable information about the local market. Bankruptcy protections can be seen as personal insurance which promotes the undertaking of entrepreneurial risk (Fan & White, 2003), and as such they could muddle this information if riskier and more prone to failure ventures are started under the cover of more generous exemptions.

Hofstede et. al (2000) focus on institutional, legal and cultural components of a society that enable entrepreneurial activity to take place, which Audretsch and Keilbach (2004) later identify as "entrepreneurship capital ... "[: a] capacity for economic agents to generate new firms." According to Audretsch et al, this entrepreneurship capital is a factor of production that is not accounted for in the neoclassical production function and that constitutes an overlooked contributor to the divergence in economic achievement. The authors empirically show that it is indeed a significant explanatory variable in predicting differences in production amongst German regions.

We have seen before how the legal literature and the language in the 1978 Bankruptcy Act link bankruptcy exemptions to a desire to foster entrepreneurship in the economy. The economic

literature provides the theoretical and empirical underpinnings for the rationale, and thus bankruptcy exemptions can be viewed as one of the legal and cultural components of Audretsch's "entrepreneurship capital". And as we want to explore what the link between bankruptcy exemptions and entrepreneurship is, it is useful to review some features of the law and some of the economic literature that has previously explored the topic.

1.2.4 Economics Literature on Personal Bankruptcy Exemptions and Entrepreneurship

We started this introduction by pointing out how the language in the Bankruptcy Act establishes the connection between property exemptions and its main goal, which is to make a fresh-start possible to people in financial trouble so that a would-be entrepreneur is not in fear of destitution. William Whitford (1979) explains that:

"Exemption and bankruptcy statutes may also serve wealth maximization objectives by setting a floor on the riskiness of indebtedness and hence promoting borrowing. If prospective debtors as a whole are excessively risk adverse, promotion of borrowing will further society's overall economic interests."

In the economic literature the possible impact of personal bankruptcy exemptions on entrepreneurship has been explored before, the common point of departure being (as in the legal literature that preceded it) the driving force behind an individual's decision to earn a living in the employ of others vs trying to make it on their own. The main issues at play in this decision will be the risk aversion of the individual decision maker in juxtaposition with the constraints in the ability to obtain credit.

Fan and White (2003) explore whether entrepreneurship is more likely with a high bankruptcy exemption in a two-period model in which a risk-averse individual must choose whether or not

to become an entrepreneur. Modeling the bankruptcy exemption as a form of expected utility increasing wealth insurance, and using data from the Survey of Income and Program Participation, they show that living in a state with higher bankruptcy exemptions would entice a potential entrepreneur to want to start a small business.

However, when looking at access to credit for the potential entrepreneur, Berkowitz and White (2004) note that the liabilities of small unincorporated enterprises are also those of the business owner. Even in the case of small incorporated business ventures, a lending agent would be reticent to provide funds without the backing of some sort of personal collateral. In this case a troubled borrower would be more likely to file for bankruptcy and have debts discharged if living in a jurisdiction with generous exemption protections. Berkowitz and White (2004) model a two-period problem for a representative risk neutral lender who maximizes expected profits. The lender has to decide whether to lend to an entrepreneur who, if filing for bankruptcy, is protected by personal property exemptions from losing all his/her wealth. Bankruptcy exemptions would increase the expected loss to the lender in case of default, and the authors show that credit for small firms is more likely to be rationed or denied altogether in states which have unlimited or very generous home exemptions.

In addition, an entrepreneur's willingness to put personal property on the line when acquiring credit can serve as a cue of credit-worthiness. This signal could be useful to lenders who otherwise might not be able to ascertain the probability of default of different borrowers, or to verify if claims of insolvency by a borrower are indeed real. Generous bankruptcy exemptions mute or dampen this signal as they safeguard from repossession assets that are of importance for the entrepreneur, and absent this indicator the creditor may set a general expected profit maximizing interest rate for all borrowers that simply reflects the average probability of default.

However, lenders may not be willing to increase the interest rate beyond the point that might discourage good creditors from applying, thus capping the interest rate and rationing the supply of credit (Stiglitz, 1981). This would result in unmet demand for credit by less credit worthy would-be entrepreneurs, and in thus way, more generous bankruptcy exemptions would result in reduced levels of entrepreneurship (Hynes, Political Economy of Property Exemption Laws, 2004).

As we have seen, the theoretical and empirical economic literature so far has provided evidence that bankruptcy exemptions have both entrepreneurship enhancing effects through their impact on the entrepreneur's expected utility, and they also have deleterious repercussions as they restrict the access to credit for entrepreneurial ventures. We thus proceed to review the relevant literature that has tried to address what the overall effect of exemptions on entrepreneurial activity is.

In the legal literature, Nathalie Martin (2005) states that "research suggests that states with higher exemptions, which allow an individual debtor to keep more assets free from creditor claims, have the highest levels of entrepreneurship in the country" (Martin N. , 2005) although the sources for this assertion are not made clear. Georgellis and Wall (2006) examine data from 1991 to 1998 for the effect of the homestead exemption (as a measure or proxy of the generosity of bankruptcy exemptions in general) on the proportion of non-farm proprietors. Their homestead exemption variable is built by looking at the highest home exemption available in each state or, if this is higher than the average house price, they use this average instead; by doubling this figure in states which allow the doubling of exemptions for a married filer, and dividing by the average house price, they obtain their measure of each state's homestead

bankruptcy exemption. The authors argue that this is their approach to “capture the exemption that the average person in a state *might* face” (Georgellis, 2006).

By use of state fixed effects regression of the proportion of non-farm proprietors on linear, squared and cubed transformations of the exemption variable, and using demographic and economic variables as controls, they show that the relationship between exemptions and entrepreneurship within each state is S-shaped: when the exemption rate is very low or very high, higher homestead exemptions lower the rate of entrepreneurship. But for exemption rates between 20 and 60 percent the wealth insurance effect dominates, and higher exemptions lead to more entrepreneurship within each state.

In contrast to this negative, then positive, then negative relationship between homestead exemptions and self-employment, Armour and Cumming (2008) use data across countries and find a positive relationship between the overall generosity of bankruptcy laws and entrepreneurship (Armour, 2008). However, this work looks at the impact of changes in laws which in effect amount to the adoption of completely different bankruptcy regimes in those countries, and which often includes the implementation of previously non-existent fresh-start provisions. Thus, their results might not be directly extrapolated to the United States where a uniform Bankruptcy Act with a fresh-start provision has existed since 1898 (Jacobvitz, 2019), (Hallinan 1986), (Gross 1986). In spite of this, and as we are investigating how past literature might provide guidance on the overall effect of exemptions on entrepreneurial activity, it might benefit us to keep in mind this positive link found in other countries between the overall generosity of bankruptcy provisions and self-employment.

Lastly Primo and Green (2011) use a state panel from 1980 to 1996 to regress the proportion of non-farm proprietors on a hybrid measure of exemptions obtained as the result of adding the

homestead exemption to the wildcard and motor-vehicle exemptions. Primo and Green do not find a statistically significant effect of bankruptcy exemptions on self-employment, except in a singular specification: only when they include a cubic function do they find a first negative, then positive and again negative pattern as Georgellis and Wall did. When they use venture capital inflows as a measure of innovative entrepreneurship, one of their specifications including quadratic terms is significant following a U pattern that is first negative and then positive. However, although the study utilized a 16-year span of data going to 2006, there is a chance that the passage of BAPCPA law in 2005 (which was not controlled for in this analysis) may have confounded the analysis. Still, their results somewhat fit the narrative of tightening credit markets as exemptions increase (posited in the work of Berkowitz and White), but they also contrast with Armour and Cumming's 2008 findings of a positive relationship across different countries between the overall generosity of bankruptcy laws and self-employment. Altogether, these varied results beget clarification and leave the question open regarding whether proper consideration for the unique peculiarities of the US bankruptcy laws (regarding the passage of the BAPCPA and its "opt-out" clauses) would result in more robust estimates.

1.3 Data Description and Trends.

As we have already stated, our aim is to discover what is the ultimate effect on entrepreneurship of bankruptcy exemptions available in the current law, and to shed some light on inconclusive or contradictory results found in the previous literature. The 2005 BAPCPA was a significant change in the law, and thus we also want to investigate whether or not it also plays a role on the number of new ventures started. Previous work has mainly focused on self-employment as a measure of entrepreneurship, but it might be profitable for us to use another metric.

1.3.1 Geographic and Time Context

We use the fifty U.S. states and the District of Columbia as our geographic unit of interest which is the appropriate unit of analysis because of two reasons: First is that decisions about exemption levels are made by the local state legislatures and have application state-wide. And second is that although it is of course possible for an entrepreneur to reside in a given state and start a business in another, bankruptcy and exemption legislation should have no bearing on this decision as the pertinent jurisdiction in the matter is that of the state in which one resides (notwithstanding the location of the assets).

Regarding the time frame of our analysis, we will focus on the period from 1985 to 2014 because as we will explain later, this is the period in which the current law has been in effect without major structural changes, except for the available dollar exemptions and a one-time change in the implementation of the law in 2006 (later discussed) that is easily controlled for. The rest of this section will describe the data used in the statistical and graphical analysis to follow.

1.3.2 Entrepreneurship Data

Non-farm proprietor self-employment is commonly used in the literature (and in most of the works cited above) as a measure of entrepreneurship, but this approach is not without shortcomings. The BEA defines proprietors as “active proprietors or partners who devote a majority of their working hours to their unincorporated businesses.”¹³ Therefore there is not necessarily a one-to-one relationship between the number of self-proprietors and entrepreneurial

¹³ <https://www.bea.gov/system/files/2019-12/Chapter-10.pdf>

activity: for one, several proprietors could be participating in the same business venture, and if we assume that the ratio of partners to projects remains constant across states and through time we might be introducing unobserved heterogeneity in the data. In addition, by the BEA's definition this measure does not account for entrepreneurs involved in new projects which are incorporated. Layoffs of the workforce in a business previously employing a few people would also be reflected in this value. And lastly, a new business venture might be undertaken as a part-time side "gig" by somebody deriving most (or all) of their income elsewhere.

It is for this reason that for a measure of entrepreneurship to use as our dependent variable we will focus on another statistic that is also often utilized in the literature: the Business Dynamics Statistics' (BDS) number of business organizations. As the BDS provides these by age for each state, we will use the number of new firms (age=0) divided by a state's population (from the U.S. Census) as a direct measure of per-capita entrepreneurship for a state per year, which is my dependent variable. As we have already seen, the main stated purpose of the bankruptcy law is to foster entrepreneurship (and not necessarily self-employment) and focusing on the number of new firms seems more appropriate if we are to explore the laws' efficacy in this matter. Although a measure of new establishments is also available from the BDS, it measures both expansions of previously existing firms as well as the creation of new businesses.

1.3.3 Exemptions and Their Measure.

Our regressor of interest, the generosity of the state's personal bankruptcy exemptions, requires a bit more consideration. The challenge here is that the Bankruptcy Act of 1978 establishes a set of Federal exemptions, but states are allowed to "opt-out" of these and enact their own. In fact, there are states which allow filers to choose between their own exemptions and the federal ones

(as long as they do not mix and match). In addition, the federal and state exemptions are available for different categories of property, such as home, automobile, jewelry, tools of the trade, firearms, etc., and these are not consistent from state to state. For some, a dollar amount is established as exempt from repossession. For others, such as clothing or firearms, a number of items exempt are set as a limit. And in some jurisdiction, some items are fully exempt from repossession (i.e. bibles and wedding rings often, but in a few states the home dwelling itself is fully exempt).

Regarding the manner on how to treat these exemptions, Hynes et. al. (2004) show that contemporary exemptions are exogenously determined by each state's historical attitudes towards bankruptcy and thus can be statistically considered as such. However, we still have to resolve the matter of how to best compute these exemptions.

The following are issues to resolve in the accounting for the state's exemptions:

1. As we mentioned above, some states allow a bankruptcy petitioner to file using their choice of state or federal bankruptcy exemptions. We seek to elucidate what the effect of available bankruptcy relief is on entrepreneurship, and thus, as in previous literature, we will assume that it is the greater of the two that is of relevance in such cases.¹⁴

¹⁴ Other authors use the average house price in the state if smaller than the maximum allowed state or federal exemption, as an "accurate representation of the exemption that the average person would get" (Georgellis 2006). However, as we argue in point 2, this at best represents an ex-post figure for the exemption that an actual bankruptcy filer would enjoy (if such representative filer were also the average home owner), and is not the best representation of the "culture" of bankruptcy forgiveness in the state. If state statutes explicitly have codified or allowed for exemptions that are greater than the median home value then we find no reason to use the later, as our purpose is to study the effect of such statutory relief on entrepreneurship.

2. Some state statutes and the federal law allow certain (or all) exemptions to be doubled for married couples filing for bankruptcy together. Because of this, previous research used the doubled figure for states that allow this, sometimes weighted by the percentage of married adults in the state. The problem is that this approach to the treatment of the effect of exemptions on entrepreneurship assumes a uniform distribution of entrepreneurs between married and unmarried folks for each state and across time, and also assumes that all married couples would be together both in new business ventures and in filing for bankruptcy in all states in which the doubling is allowed. This metric is also ex-post, in the sense that it would be the exemption that applies to married people that are actually in the process of filing for bankruptcy, or actively considering it, and have to decide which filling scheme to pursue (jointly or separate). Their ex-post thought process is not likely to be the same as the one entertained by a would-be entrepreneur, married or not, who ponders the general consequences of (a remotely possible in their mind) bankruptcy in their particular State. In its impact on entrepreneurship, if it exists, we think it is more appropriate to think about the ex-ante effect that the exemption applying to every single person in the state could have on their decision to start a risky project, as it is a proxy for the jurisdiction's institutional "forgiveness" towards anybody who might fall under duress. This culture of forgiveness is what is relevant to would-be risk takers, and it is different from the circumstances in which actual bankruptcy filers may find themselves should disaster befall them. It is because of this that we use non-doubled exemptions, which are available to everyone, as a measure of bankruptcy relief for each state.

3. A different challenge is that of deciding which asset class of exemptions to use. It would be difficult to build an aggregate indicator of these such as the sum or weighted sum of property classes (i.e. adding the homestead, motor vehicle and wildcard exemptions as in Primo and Green, 2011) because the relative importance of each is bound to be different across states, and because some statutes just list a number of items which are exempt whereas others list dollar values. In addition, it is not uncommon for state statutes to legislate the amount exempt in one asset class to be dependent on the exemption claimed in another.¹⁵ Our approach then is to focus on two distinct exemptions: the homestead exemption, which without a doubt would be the most important asset class for anybody who owns a home or considers the possibility of owning one in the future, and the “wildcard” exemption which provides with a neat dollar figure that any filer could apply towards any asset of their choosing.¹⁶
4. The final hurdle we encounter when trying to account for exemptions is how to treat “unlimited” or “full” homestead exemptions (of course no such thing applies to the “wildcard” exemption). For lack of a better measure, previous work has used the average of the two highest state exemptions to substitute in a figure for unlimited

¹⁵ California in 2014 allowed a \$75,000 homestead exemption and \$3,050 in motor-vehicle exemption and no wildcard exemption, or else a \$26,800 homestead exemption with a \$5,350 motor-vehicle and a \$26,800 wildcard exemption. The same year West Virginia allowed a \$25,000 home exemption and an \$800 wildcard, or a \$25,000 wildcard if no home exemption was claimed. Like-wise for the Federal exemption, which in 2014 was \$1,225 for the wildcard if the \$22,975 home exemption was claimed, or \$11,500 if it was not.

¹⁶ The motor-vehicle exemption would be one to consider as well, but the importance of owning a private vehicle is not the same across all regions of the country. In addition, a few states fully exempt this asset class and pinning a dollar figure to this protection would be unfeasible.

home exemptions. Instead, we use Zillow's top-tier Home Value Index (ZHVI) which is the "typical value for homes within the 65th to 95th percentile range for a given region",¹⁷ and either input this measure directly for unlimited exemptions or use a 95% top estimate for the highest home value in the state assuming a normally distributed ZHVI.

In summary, our focus will be directed to either the maximum home or the maximum wildcard exemptions available to any potential bankruptcy filer (married or not) in a state, and made available by federal statute or from state, constitutional or case law.

There are other considerations regarding exemptions and the time frame of bankruptcy laws. By 1983 most states had determined whether they wanted to opt-out of the federal exemption regime or not. In addition, after 1985 the implementation of the law becomes more uniform as it bars married debtors in non-opt states from stacking state and federal exemptions (Ponoroff, 2014). Our analysis will therefore use data from 1985 on, as it reflects mere changes in exemption amounts and not in the structural ways in which bankruptcy is implemented, except for the one-time enactment of BAPCPA in 2005 whose possible impact we want to gauge and which we can easily control for.

1.3.4 Existing Business Base and Dynamism

I control for the possible impact that existing businesses could have on the generation of new ones. Research has also shown that entrepreneurial dynamism influences regional economic

¹⁷ Available from 1996 on: <https://www.zillow.com/research/data/>

performance (Kacher, 2019) and thus we attempt to account for this as well. Both measures are obtained from the aforementioned BDS, and in the case of dynamism I construct its measure as a “churn” term, the product of the number of firm births times the number of deaths divided by the total number of firms in the state. Both variables are lagged one year with respect to the DV to avoid reverse causality as it would be impossible for the future entrepreneurial environment to influence what happens in the present.

1.3.5 Demographic and Economic controls

Entrepreneurship research finds that higher rates of Gross Domestic Product (GDP) growth lead to an increase in opportunities for new startups (D. Audretsch, 2007) (Acs, Audretsch, & Lehmann, 2013). To control for the economic factors that could have an impact on the formation of new firms, I use measures of state unemployment (2-year moving average), GDP per-capita and GDP growth for each state from the Bureau of Economic Analysis (BEA). Again, GDP measures are lagged one period with respect to the dependent variable (DV) to avoid reverse causality¹⁸.

Two separate measures of inflation are utilized based on the Regional Price Parity index from the Bureau of Labor and Statistics or on the Housing Price Index from the Federal Housing Finance Administration. These are used by themselves as controls, and also as indexes to adjust historical bankruptcy exemption levels and GDP and other economic performance metrics to real

¹⁸ Other measures of economic activity such as lagged median household income and its growth (available from the U.S. Census) were also utilized, without making a difference in the results obtained.

dollar terms. To gauge the possible effect that different levels of education might have on the dependent variable, I account for the percentage of the population of age 25 and older with a high-school diploma or more schooling. These were obtained from the Digest for Education and Statistics from the National Center for Education Statistics which is available from 1991 on.

Furthermore, population concentration has been shown to enhance entrepreneurship opportunity through the exchange of ideas (D. B. Audretsch, 2008), and to control for this I thus use a measure of population density per square mile of state area (and per square mile of *land* area) constructed from data from the US Census' Bureau of Economic Analysis.

1.3.6 Tax and Policy Environment

Higher taxes on wages might promote entrepreneurship, especially if taxes on investments and capital gains are by comparison less onerous. Furthermore, the way in which those taxes are used can also be important, since better provision of public goods and infrastructure could enhance opportunities for entrepreneurship. Regarding taxes, I use controls for each states' and year's maximum combined Federal and state tax on wages and on long-term capital gains, obtained from the National Bureau of Economic Research's TAXISM model. I also use a rudimentary infrastructure control (discussed in the next sub-section) to take into consideration the accoutrement of public goods.

Interest rates impact the availability of credit and the risk and profitability of leveraged projects. Thus, I include measures of the Federal Discount or the Federal Funds rate from the Economic Research Division of the Federal Reserve Bank of Saint Louis as a proxy measure.

1.3.7 Physical Infrastructure

We have already discussed how it is possible for geographic proximity and population density to have an effect on entrepreneurial generation by facilitating the exchange of ideas; but another mechanism through which this impact could be realized is via the thicker physical infrastructure which is typically present in more densely populated areas. The research on infrastructure and entrepreneurship is still developing, and work by Audretsch et. al. (2015) points to a positive effect of highway, railway and broadband density on new startups. Because of this I introduce a measure of highway density as the number of lane-miles of highway available per population to account for the richness of the infrastructure network in the state. This information comes from US Department of Transportation Federal Highway Administration, and includes data on roads in the care of a public authority which are available for public use.

1.3.8 Other Miscellaneous Controls: Amenities and Weather

The entrepreneurship literature consistently finds a link between the availability of amenities and the relocation and startup of new firms, with the weather being a main contributor to the basket of such desirable lifestyle features. NOAA's National Centers for Environmental Information provides average monthly temperatures per State and I use the average January temperature (in °F) as a control for the influence of weather amenities on entrepreneurship.

Table 1-1 and Table 1-2 in the next two pages provide descriptive statistics for the data and its correlation matrix:

Table 1-1: Description, Sources and Summary Statistics of Variables

Variable	Description	Mean	SD	Min	Max	N	Source
New firms per population	Number of new firms created per 100,000 people in the state.	207.08	52.49	87.92	443.81	1479	Business Dynamics Statistics
Firms	Number of existing firms in the state	96242	103768	8518	627092	1479	Business Dynamics Statistics
Firms' churn	(Entry x Exit)/(Total firms) → dynamism	897.89	1133.97	56.85	7453.61	1479	Business Dynamics Statistics
Average January Temp.	State average temperature during the month of January, in °F	34	13.03	.6	76.10	1477	NOAA
Max wage tax rate	Max State+Federal tax rate on wage income	40.57	4.945	28	55.83	1479	NBER TAXISM model
Max long gains tax rate	Max State+Federal tax rate on capital gains	25.32	5.83	15	36.98	1479	NBER TAXISM model
Unemployment rate	State's annual unemployment rate	5.76	1.90	2.3	13.7	1479	Bureau of Economic Analysis
GDP growth	% Growth in the state's real GDP	2.60	3.54	-29.15	22.35	1479	Bureau of Economic Analysis
Discount interest rate	% Federal discount rate	3.76	2.15	.5	7	1502	FRED Saint Louis Fed Reserve
Inflation rate (HPI)	% Change in House Pricing Index, used as measure of inflation. Average US home price in 2000 used as index benchmark.	3.13	5.43	-23.07	29.87	1479	Federal Housing Finance Agency
Real GDP per-capita	State's real GDP per capita	36436	11950	17877	123718*	1479	Bureau of Economic Analysis
High school ed	% Population age 25+ with high school diploma or higher education.	85.66	4.69	67.1	93.6	1173	National Center for Education Statistics, Digest of Education Statistics.
Highway miles per capita	# total highway lane-miles per person, used as a measure of infrastructure density.	.050095	.051288	.004183	.275815	1460	US Department of Transportation, Federal Highway Administration
Post BAPCPA	BAPCPA law in effect (post 2005, 1=Yes)	.311585	.463295	0	1	1502	Pub.L. 109-8 , 119 Stat. 23
Change in Home exemp.	Statutory amount change in allowed home exemption (1=Yes)	.200151	.400264	0	1	1324	State and Federal statutes
Adjusted \$ Home exemp.	Home exemption adjusted by HPI index, in \$10,000. "Unlimited" exemptions are accounted for by using Zillow's Top Tier Home Value Index.	9.89575	16.2062	0	80.2667	1345	State and Federal statutes, and Zillows ZHVI.
Change in wildcard exemp	Statutory amount change in allowed wildcard exemption (1=Yes)	.108374	.310962	0	1	1421	State and Federal statutes
Adjusted \$ Wildcard exemp	\$wildcard exemption adjusted by HPI index, in \$10,000.	.54653	.73033	0	5.7688	1429	State and Federal statutes

NB: All variables measured at the annual, state level for the years 1985 to 2014

* Would be \$69,790 if District of Columbia excluded

Table 1-2: Matrix of Correlations for 1986 to 2014 time period

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(1) New firms per 100K population	1																	
(2) firms	-0.1461*	1																
(3) Firm's churn	0.0287	0.9463*	1															
(4) Average Jan. temperature (°F)	-0.0745*	0.2920*	0.3876*	1														
(5) Max tax rate on wages	0.0071	0.0154	-0.016	0.0092	1													
(6) Max tax rate on long gains	0.2231*	-0.0211	0.0196	0.0098	0.0211	1												
(7) Unemployment rate	-0.3760*	0.1595*	0.1170*	0.1609*	-0.0664*	-0.0872*	1											
(8) Growth rate real GDP	0.2960*	-0.0233	0.021	0.0109	0.0155	0.1384*	-0.3404*	1										
(9) Discount interest rate	0.4838*	-0.0386	0.0696*	0.0596*	-0.1013*	0.3761*	-0.3865*	0.1976*	1									
(10) Inflation rate (HPI)	0.3698*	0.0076	0.0402	0.0175	0.1289*	0.1406*	-0.5127*	0.3632*	0.3209*	1								
(11) Real GDP per capita	-0.0646*	-0.0209	-0.0800*	-0.0955*	0.0339	-0.2801*	0.036	-0.0327	-0.2801*	0.039	1							
(12) % Pop 25+ high school or more	0.0905*	-0.2041*	-0.2569*	-0.3863*	-0.1275*	-0.3675*	-0.1441*	-0.0623*	-0.2994*	-0.0058	0.2714*	1						
(13) Hwy lane miles per capita	0.2194*	-0.3561*	-0.3170*	-0.4101*	-0.0616*	-0.0166	-0.2663*	0.0742*	0.0488	-0.011	-0.1759*	0.1880*	1					
(14) Post BAPCPA	-0.4753*	0.0425	-0.0531*	0.0084	-0.0951*	-0.5508*	0.3010*	-0.2588*	-0.5422*	-0.3864*	0.3184*	0.3586*	-0.0489	1				
(15) Home exemption changed	-0.0590*	0.0683*	0.0749*	0.004	-0.0065	-0.2147*	-0.0187	-0.0248	-0.1327*	-0.0106	0.2595*	0.0451	0.0855*	0.1274*	1			
(16) Home exemption in \$10K	-0.0501	0.0416	0.0855*	0.0538*	-0.0068	-0.2119*	-0.0075	0.0027	-0.1639*	-0.0311	0.3454*	0.0218	0.1846*	0.1637*	0.6600*	1		
(17) Wildcard exemption changed	-0.1408*	-0.0078	-0.0566*	-0.0714*	0.0720*	-0.0877*	0.0476	-0.0570*	-0.0957*	-0.0097	0.1268*	0.0604*	-0.1016*	0.0946*	0.2231*	0.0174	1	
(18) Wildcard exemption in \$10K	-0.2635*	0.1100*	0.1061*	-0.0405	-0.0131	-0.0625*	0.0884*	-0.0027	-0.045	-0.0465	-0.0786*	-0.3159*	0.0199	0.0124	0.1261*	0.2424*	0.1155*	1

* Statistically significant at p<0.05

1.3.9 Graphical Trends in the Data.

Research points to a decline in dynamism in the U.S. economy particularly in relation to business start-ups, and this trend has accelerated since the Great Recession of 2007 (Ryan Decker, 2014). **Figure 1-1** provides a glimpse of how the inflation adjusted home exemption has changed since 1995, and seems to indicate that from 2008 onwards there is an appreciable increase in the (HPI adjusted) home exemption allowance in the state's bankruptcy statutes:

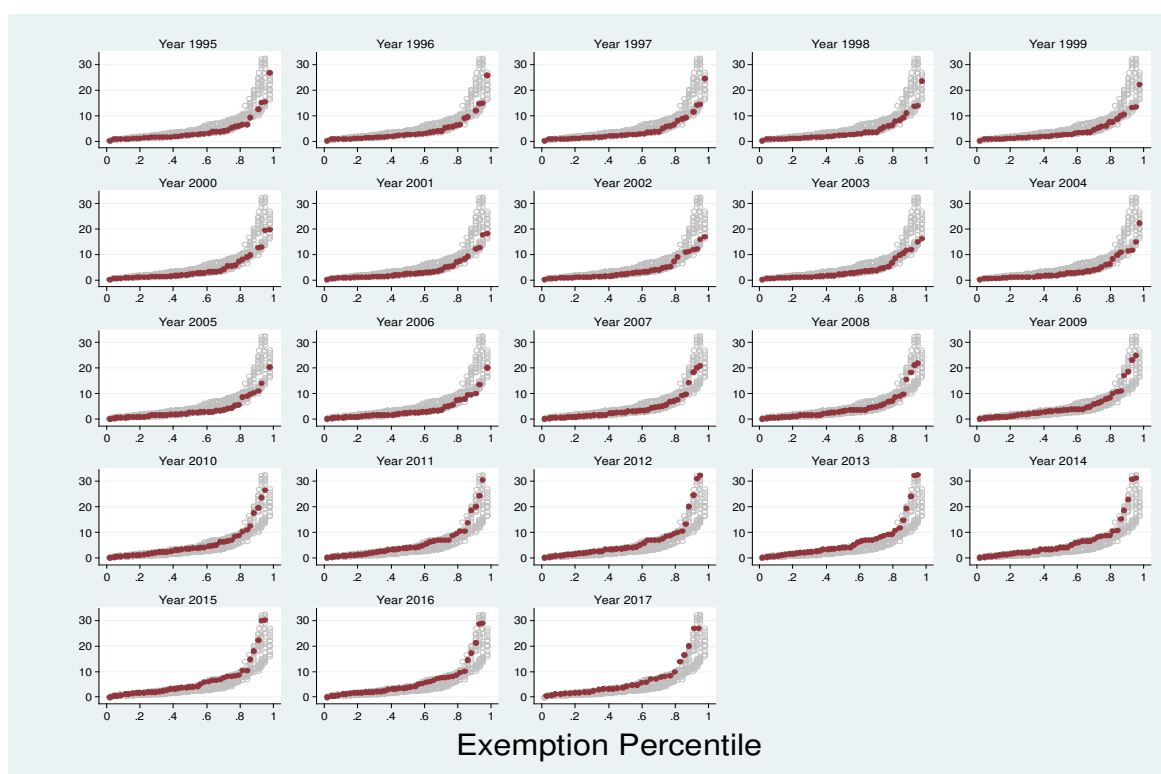


Figure 1-1: Time Evolution (1995-2017) of the Inflation Adjusted Home Exemption for the 50 States and D.C.¹⁹

¹⁹ Excludes NV, which experienced high fluctuations in inflation during 2012-2017

Regarding the wildcard exemption, Figure 1-2 shows that it declined after 1999 to rebound again ten years later, after 2009. Altogether the graphical evidence seems to point to an overall increase in the generosity of the states' statutes regulating exemptions which is accentuated from the year 2008 onwards.

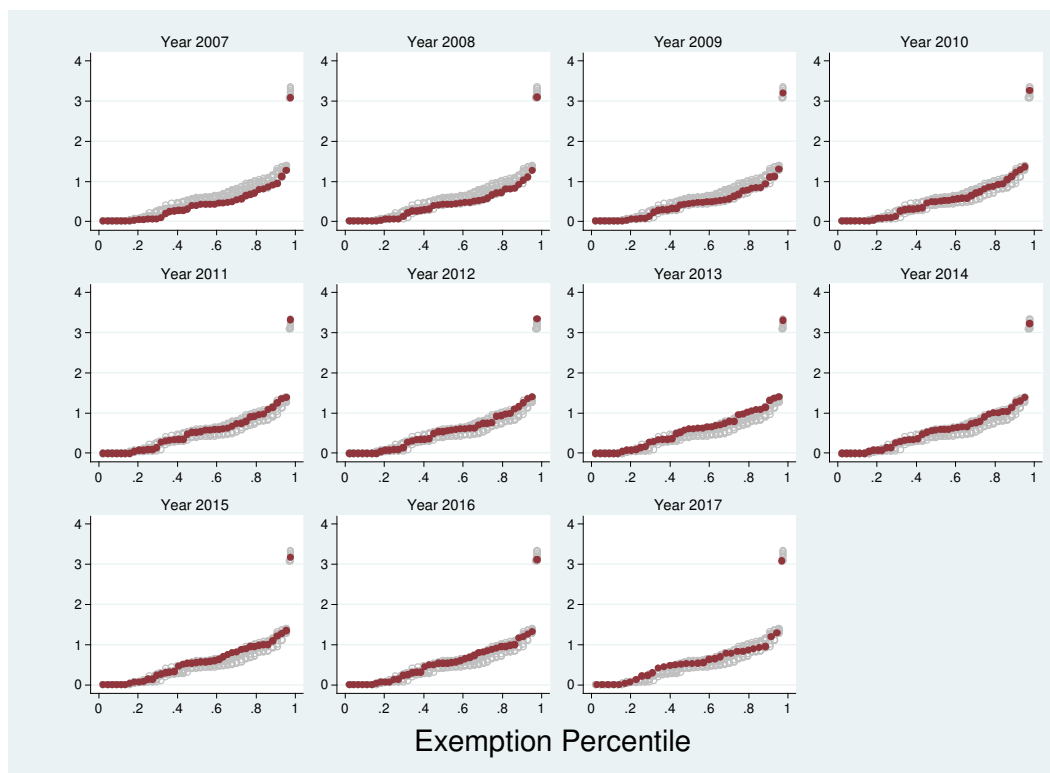


Figure 1-2: Time Evolution (2007-2017) of the of the Inflation Adjusted Wildcard Exemption for the 50 States and D.C.²⁰

²⁰ *ibid*

Figure 1-3 and Figure 1-4 illustrate the relationship between the home exemption and the number of new firms per capita.

When viewing the 50 states together Figure 1-3 shows that:

- The inflation adjusted home exemption has grown larger (in inflation adjusted terms) throughout the years, especially after 2007.
- For each year, when all the states are viewed as an aggregate, larger inflation adjusted home exemptions seem to be positively correlated with an increase in the number of new firms per capita.

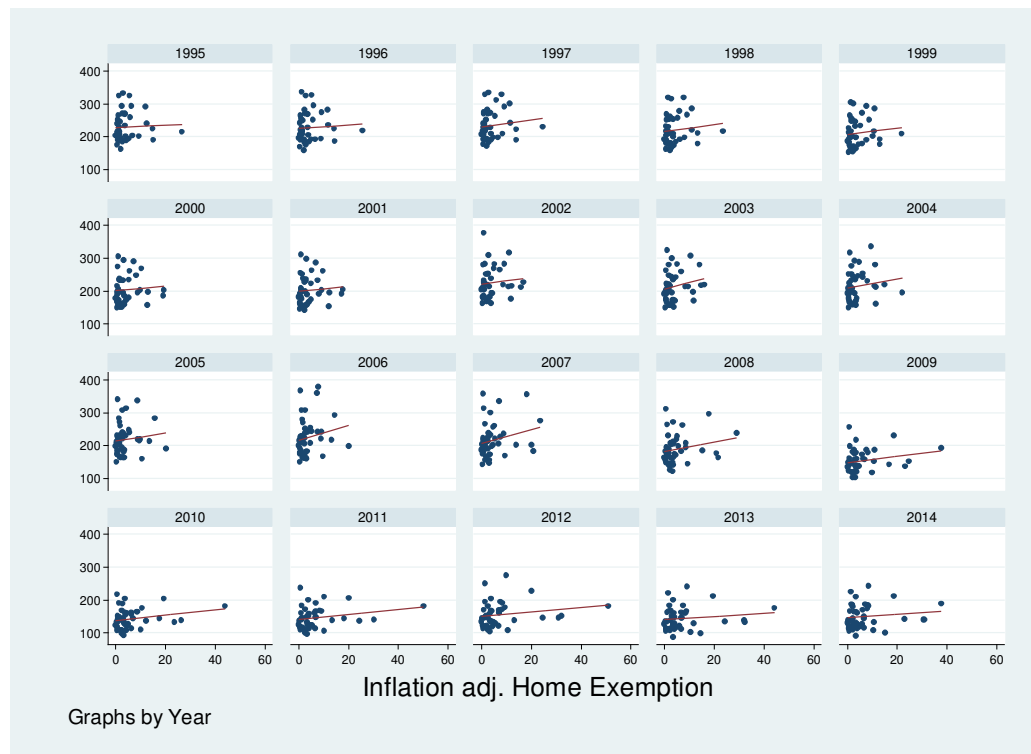


Figure 1-3: Year by year overall relationship between inflation adjusted home exemption and number of new firms, for the 50 states combined.

However, when focusing on each state individually, within each given state the relationship between the inflation adjusted home exemption and the number of new firms per capita seems to be negative, and larger exemptions are correlated with fewer new start-ups. This is shown in Figure 1-4 for the 16 most populous states, although for TX, NJ and TN the relationship seems to be positive.



Figure 1-4: Relationship between inflation adjusted home exemption and #new firms, for the 16 largest states (by population).

1.4 Econometric Model and Estimation Methodology

1.4.1 Model Specification

Equation 1-1 is the econometric model utilized to explore the relationship between the y_{it} dependent variable (DV), which is the number of new firms per 100K people, and the legal bankruptcy framework for each State and the District of Columbia between the years 1986 and 2014:

$$\begin{aligned} y_{it} = & \alpha_0 + (\alpha_1 y_{i,t-1}) + X_{it}\beta_1 + Z_t\beta_2 + \delta \text{bapcpa}(1,0)_t & \text{i. (Equation 1-1)} \\ & + \{ \rho_1 \text{exemp}_{it} + \rho_2 D_{it}(1,0) + \rho_3 \text{exemp}_{it} \times D_{it}(1,0) \} & \text{ii.} \\ & + \theta_i + vT_t + \varepsilon_{it} & \text{iii.} \end{aligned}$$

$$i \in \{1,2, \dots, 51\} \text{ all States and D.C, } t \in \{1986, \dots, 2014\}$$

- i.
 - $y_{i,t-1}$ Lag of the dependent variable (DV) to be included in some specifications
 - X_{it} a matrix of State and time-varying control variables
 - Z_t a matrix of time-varying controls (namely Federal Discount rate)
 - $\text{bapcpa}(1,0)_t$ a logical variable controlling for whether or not stricter requirements for Chapter 7 bankruptcy are in effect via 2005 BAPCPA law (1=Yes, 0=No).
- ii. This is the Difference-in-Difference term which includes intercept and slope elements to determine the influence that changes on exemption levels may have on the DV:
 - exemp_{it} inflation adjusted exemption (in \$10,000).
 - $D_{it}(1,0)$ a binary variable indicating whether a new statutory exemption level was legislated in the state for the current year (1=Yes, 0=No).

- $exemp_{it} \times D_{it}(1,0)$ allows for a possible change in the slope/effect of the inflation adjusted exemption level on the DV when a new statutory exemption is legislated.
- iii. · θ_i and T_t state and year fixed effects.
- ε_{it} vector of characteristic errors.

1.4.2 Estimation Method

A Hausman test on the data points to fixed effects being the appropriate estimation method, and our specification thus includes state and year effects. Fixed effects allow us to control for unobserved factors such as geography, culture and historical traditions, that are different across states but do not change through time. They get rid of unobserved variation between states, leaving us with the variation within each of them. Year fixed effects on the other hand control for the bias introduced by unobserved time changing factors that influence all states equally, such as the national political climate and international uncertainty, overall trend of the real estate market, consumer confidence, crude oil prices, etcetera.

1.4.2.1 Endogeneity considerations

It is important that the direction of causality between the variables of interest and the dependent variable is adequately modeled, because if done incorrectly (or if feedback effects are present) then the derived estimators are biased. As the asset exemptions in the bankruptcy law are statutory amounts typically decided by the state legislatures, it is improbable that would-be entrepreneurs have an influence on this process; we are not aware of any organized effort by prospect business owners to influence this legislation. We are thus confident that endogeneity concerns are not an issue in the estimation of the model presented above.

1.4.2.2 Autocorrelation issues

The quality and amount of information contained in a panel is diminished if there are dependencies in the data across time or across individuals. Correlations of the residuals will bias regression results. Wooldridge provides an easy to implement test (Stata command `xtserial`) for the hypothesis of no first order serial auto-correlation in the errors (Wooldridge, 2002). We carry the test on 1101 observations, and obtain an $F(1, 50) = 41.427$ with a p-value = 0.0000 which leads to the rejection of the hypothesis that serial correlation is not present in the data. Therefore, my fixed effects modeling approach will incorporate cluster-adjusted standard errors. This approach takes care of possible heteroscedasticity and of autoregressive correlations within groups.

1.4.2.3 Spatial (or cross-sectional) correlation matters.

Regressions on panel data for social issues can suffer from the fact that social, economic, political, cultural and demographic influences that are unobserved but common to all participants may influence the final outcome. Non-measurable cross-sectional dependencies thus may be present in the data, although these dependencies will not affect the consistency of the estimators as long as they are uncorrelated with the explanatory variables. Nevertheless, if this cross-sectional dependency is not accounted for in the covariance matrix for the regression, the results will yield inflated estimates of the standard errors which make them not suitable for use in inference (Driscoll & Kraay, 1998).

Pesaran's test of cross-sectional independence for unbalanced panels returns a statistic of 0.340 with a p-value of 0.7342. Happily, it is then not possible to reject the null of no cross-sectional

dependence in the data, but the downside is that this test only works for large time samples. Our panel data set has an average of 21 observations per group, and the possibility exists that we lack enough data for this test to have enough statistical power to detect cross-sectional autocorrelation. To deal with cross-sectional correlation issues Driscoll and Kraay develop an estimate of the covariance matrix that is nonparametric in nature and is robust to heteroskedastic, cross-sectional and auto-correlated (up to any order) relationships in the residuals. These are available in Stata with the command `xtscc` (Hoechle, 2007). We will present the results from this estimation method in Table 1-3 (in the column labeled “Driscoll-Kraay”) alongside the results obtained from clustered robust estimation, because as already stated, there is a chance that our time sample is not long enough to detect cross-sectional correlation in the data.

1.5 Contribution and Main Hypothesis

Although previous research has explored the connection between entrepreneurship and the mosaic of different bankruptcy exemption protections available throughout the US, this paper is the first one that anchors such relationship within the legal context of the “fresh-start”. As the Supreme Court has maintained that this is indeed the main purpose of the Bankruptcy Act, my paper bridges the legal and the economics literature in the investigation of this topic.

In the past, empirical panel data work exploring this relationship has suffered from measuring issues as ad-hoc methods had to be employed to account for the “unlimited” nature of the homestead exemption available in a few states. This paper solves this by using data available from Zillow for the top 95 and top 99 percentile home values in such jurisdictions. In addition, the number of firms (per population) more precisely quantifies entrepreneurship, as it directly gauges the number of new start-ups instead of relying on indirect measures such as the

percentage proprietor's employment in the labor force. But most importantly, this paper uses up to date figures to explore two issues in the current legislation that have not been looked at before:

1. Different price parities across states and thru time mean that the effective bankruptcy exemptions are in a constant condition of relative change. As stated, the overall connection between these exemptions and entrepreneurship has been the subject of previous studies. But if a general relationship exists between bankruptcy exemptions and entrepreneurship, is it altered when a state modifies its statutes changing the nominal exemption amount? In other words, is there a causal relationship between statutory changes in the bankruptcy exemptions and entrepreneurship, and if so, how long does this last? I use a Difference in Difference model to explore this issue, which is encapsulated by term (ii) in Equation 1-1.
2. The 2005 BAPCPA is a major modification of the 1978 Bankruptcy Act which imposes conditions and restricts the access to a Chapter 7 bankruptcy discharge of debts, without major modifications to the exemptions available to those who qualify. Did the BAPCPA, by restricting the access to a "fresh-start", have an impact on entrepreneurship (which the Supreme Court says is the main purpose of the bankruptcy law)? The fifth element in term (i) of Equation 1-1 controls for this event in our econometric specification.

From the modeling perspective, this paper makes use of a long panel as entrepreneurship is likely to be the consequence of a dynamic process in which past occurrences could have an impact on the present. This possibility was not modeled in previous empirical research on this topic which relied on fixed effect approaches controlling for time-invariant unobserved state characteristics. This paper utilizes a difference in difference design to account for the possibility

of such dynamic relationships, and the causal forces driving them. Thus, the two main hypotheses that I test in the structural model are:

1. The ability to shield some assets from repossession in the event of bankruptcy acts as a form of insurance for the would-be entrepreneur, and thus enhances the attractiveness of starting a business project. On the other hand, there is greater risk to lenders financing such start-ups when there is less collateral available and the greater the exemption protections the less willing a financier would be to fund a third-party business project. Altogether this means that the level of bankruptcy exemptions impacts entrepreneurship, but it would do it positively or negatively depending on which of these two effects is stronger: either one or all of ρ_1 , ρ_2 and ρ_3 should be non-zero and statistically significant in term (ii) of Equation 1-1.
2. The 2006 BAPCPA law restricts access to the kind of total debt discharge that Chapter 7 bankruptcy provides (the proverbial “fresh-start”). A troubled borrower considering any sort of bankruptcy is already a write-off that a-priori no lender would wish to take on. The impact of BAPCPA should therefore befall mainly on borrowers, and as a “fresh-start” is no longer guaranteed after BAPCPA, the prospect of forever being burdened with insurmountable debt should decrease the desirability of taking on risk: BAPCPA should have a negative impact on entrepreneurship, and the δ parameter in term (i) of Equation 1-1 should be negative and significant.

1.6 Estimation Results:

Table 1-3 displays the results for the dependent variable being entrepreneurship as measured by the number of new firms per 100,000 inhabitants for each state-year combination. The logical variable BAPCPA indicates whether the Bankruptcy Abuse Prevention and Consumer Protection Act was in effect for the time period (post-2005), and two different panels focus on two different bankruptcy exemption measures: the left panel contains results for the home exemption and the right panel displays results for the wildcard exemption, both of them measured in \$10,000s.

Table 1-3: FE regression results

	DV: # New Firms per 100,000 population				DV: # New Firms per 100,000 population			
	Bankruptcy Exemption: Homestead				Bankruptcy Exemption: Wildcard			
	Cluster SE	Cluster SE	Driscoll-Kraay	Driscoll-Kraay	Cluster SE	Cluster SE	Driscoll-Kraay	Driscoll-Kraay
	(H1.L)	(H1.Q)	(H2.L)	(H2.Q)	(W1.L)	(W1.Q)	(W2.L)	(W2.Q)
Total Firms per 100K pple, lagged 1 yr	0.0893*** (0.0079)	0.0913*** (0.0080)	0.0893*** (0.0194)	0.0913*** (0.0186)	0.0865*** (0.0076)	0.0860*** (0.0077)	0.0865*** (0.0186)	0.0860*** (0.0189)
% Tax on Long-Term investments	2.1125*** (0.6662)	2.0464*** (0.6660)	2.1125*** (0.5808)	2.0464*** (0.5696)	2.1812*** (0.6364)	2.1944*** (0.6375)	2.1812*** (0.5258)	2.1944*** (0.5289)
% Real GDP growth lagged 1 yr.	0.4590*** (0.1140)	0.4914*** (0.1557)	0.4590* (0.2239)	0.4914** (0.2307)	0.5611*** (0.1512)	0.5633*** (0.1514)	0.5611** (0.2440)	0.5633** (0.2444)
% Fed Real Discnt rate lagged 1 yr.	-0.7401*** (0.1551)	-0.7392*** (0.1138)	-0.7401*** (0.2240)	-0.7392*** (0.2312)	-0.7539*** (0.1118)	-0.7541*** (0.1119)	-0.7534*** (0.2450)	-0.7541*** (0.2448)
% Popltn 25+ educ. high-school or more	0.5150** (0.2544)	0.5982** (0.2570)	0.5150 (0.3321)	0.5982 (0.3536)	0.6011** (0.2426)	0.5906** (0.2438)	0.6011* (0.3464)	0.5906 (0.3600)
Real gdp per capita (in dollars)	0.0011*** (0.0001)	0.0010*** (0.0001)	0.0011** (0.0004)	0.0010** (0.0004)	0.0010*** (0.0001)	0.0010*** (0.0001)	0.0010** (0.0004)	0.0010** (0.0004)
Hwy percap lane-mls (non-local)	1551.223*** (278.734)	1580.50*** (278.943)	1551.223† (906.7431)	1580.499* (892.875)	1498.285*** (271.79)	1501.102*** (272.234)	1498.285† (938.018)	1501.102† (929.468)
BAPCPA in effect (1=Y, 0=N)	-51.4443*** (9.9501)	52.3942*** (9.9549)	-70.961*** (7.0618)	-70.815*** (7.0651)	3.4965 (9.3473)	3.9016 (9.3919)	-72.8690*** (6.2413)	-72.4617*** (6.4350)
Statute change in exemption (1=Y,0=N)	-0.2597 (1.6107)	-2.1612 (1.9245)	-0.2597 (1.0865)	-2.1612** (0.8866)	-1.8501 (1.9736)	-1.1330 (2.8632)	-1.8500 (1.4578)	-1.1330 (1.4952)
Inflation Adjusted Exemption (in \$10K)	-0.5479*** (0.1255)	-1.0830*** (0.3218)	-0.5479*** (0.0972)	-1.0830*** (0.2951)	-3.1684*** (1.9753)	-4.3610 (3.7207)	-3.1683*** (1.5605)	-4.3610 (4.2328)
Adjusted Exemption ²		0.0136* (0.0070)		0.0136** (0.0062)		0.2268 (0.6345)		0.2268 (0.7676)
Statute Chg x \$Exemp (interaction)	0.3817** (0.1583)	0.9707** (0.3231)	0.3817** (0.1576)	0.9707*** (0.2407)	1.6997 (1.8061)	0.5619 (4.3075)	1.6997** (0.7783)	0.5619 (1.7533)
Statute Chg x Exemp ² (interaction)		-0.0156** (0.0072)		-0.0156** (0.0061)		0.2160 (0.8809)		0.2160 (0.2975)
R ² – within:	0.8863	0.8869	0.8863	0.8869	0.8860	0.8860	0.8860	0.8860
R ² – overall:	0.5689	0.5693	0.5689	0.5693	0.5667	0.5692	0.5667	0.5692
N	1101	1101	1101	1101	1151	1151	1151	1151
Group: min avg max	17 21.6 23	17 21.6 23	17 21.6 23	17 21.6 23	16 22.6 23	16 22.6 23	16 22.6 23	16 22.6 23
Maximum lag			2	2			2	2
Groups:	51	51	51	51	51	51	51	51

† p-value $\cong$ 0.11. State and year fixed effects estimates using Stata command xtreg with cluster() option and xtsc for Driscoll-Kraay.

1.6.1 Impact of the Controls on the D.V.

A striking result is immediately apparent from this analysis upon quick inspection: of all the variables considered, non-local highway lane-miles per capita has by far the greatest influence on entrepreneurship, although the parameter barely misses significance in models correcting for cross-sectional error dependence ($p\text{-value} \cong 0.11$) using the Driscoll-Kraay estimator. As this variable is included to proxy for the infrastructure intensity for each given state-year observation, the result aligns with recent findings in the literature that suggest that there is a positive association between the general endowment of infrastructure and start-up generation (Audretsch, Heger, & Veith, 2015) (Bennett, 2019). Also paradoxical is the fact that a 1 percent increase in the maximum tax rate on long-term gains leads to statistically significant expected increase of roughly 2 firms per 100,000 people. An explanation could be that as financial investments become more onerous from a fiscal point of view individuals are more likely to put their money into their own businesses.

Real GDP growth and education (measured as the percentage of the population 25 or older with high-school or higher education) are statistically and positively associated with an increase in the expected number of start-ups per population, but this effect is weak with estimated parameter values that never surpass 0.6 new firms per 100,000 people for each 1% increase. The association is also positive and significant for real GDP per capita, for which an increase of \$1,000 in value is expected to create one new firm per 100,000 people. Lastly each one percent increase in the real Federal Discount Rate (as adjusted for inflation) is associated with an expected decrease in the number of new firms of 0.74 per 100,000 people. This result conforms to what we would foresee happening to the number of start-ups as credit becomes dearer.

1.6.2 The Effect of Bankruptcy Legislation on Entrepreneurship.

1.6.2.1 Inflation adjusted exemption levels

As our attention shifts to the bankruptcy exemptions (measured in \$10,000), we see that both the homestead and the wildcard exemption have statistically significant effects on entrepreneurial activity. When modeled as a quadratic function²¹, it is apparent that the homestead exemption first has a negative marginal effect on the number of new firms per 100,000 people, but that this downward sloping influence becomes less negative as the exemption becomes more generous (as indicated by the positive coefficient of the quadratic term). Once the home exemption reaches up to the \$400,000 its effect on entrepreneurship becomes positive.

Recall that as the exemptions are adjusted for inflation, their value changes with the price level even when the legislated exemptions do not. Due to this, my specification includes an interaction term that controls for the effect of the exemption when it is changed at the statutory level.

Cursory examination of the quadratic function controlling for this term shows that statute increases in the homestead exemption have a statistically significant positive effect on start-ups, and this marginal effect becomes less and less pronounced as the exemption increases. At levels of the home exemption above \$300,000, the impact becomes negative. In summary:

- The inflation adjusted homestead exemption is in general negatively associated with entrepreneurship, so that larger exemptions are associated with lower levels of

²¹ Cubic specifications were modeled for both the homestead and the wildcard exemptions, but none of the terms in such functions turned out to be statistically significant.

entrepreneurship (but the effect weakens as the exemption increases). A \$10,000 increase in the homestead exemption initially leads to 1.08 fewer new firms per 100,000 people on average.

- But statutory increases in the homestead exemption are associated with marginal increases in entrepreneurship, although again, this effect weakens the larger the exemption. Here a \$10,000 increase in the homestead exemption is associated with an average increase of 0.97 new firms per 100,000 people.

Regarding the wildcard exemption, the effect is similar sans the quadratic effect which is not statistically significant. And therefore:

- A \$10,000 increase in the inflation adjusted wildcard exemption is in general associated with 3.17 fewer expected new firms per 100,000 people, whereas...
- The same increase in the statutory exemption is associated with 1.70 more expected new firms per 100,000 people.

As we have just seen, the effect of the wildcard exemption on entrepreneurship seems to be more pronounced than that of the homestead exemption. We will explore possible reasons in the conclusion.

1.6.2.2 Use of a difference in difference approach to explore the causal effect of exemptions on entrepreneurship

Difference in difference (DD) is an estimation technique incorporating the interaction effect between an explanatory variable and a logical treatment effect variable; its main goal is to determine whether or not the impact on an outcome of the explanatory variable in question is different for the section of the population that has been subject to an intervention. To this avail,

such an interaction between statute changes and the exemption amount is included in our model. But in addition to appropriate statistical significance for this interaction variable, two other conditions are necessary to infer a causal relationship between the treatment effect (in our case a change in the statute) and the dependent variable (the number of firms created): a first requirement is the accurate estimation of standard errors for the estimates of the treatment regressors, necessary to ascertain their statistical significance. Yet this necessitates independence of observations, and as these are taken closely in time pre and post-treatment, there could be causes of variation in the dependent variable that persist over time and throw off our standard error calculations. A common consensus in the literature on how to deal with this problem when large sample sizes are available is to use cluster robust standard error estimation techniques (Abadie, Athey, Imbens, & Wooldridge, 2023) (Bertrand, Duflo, & Mullainathan, 2004). This is indeed the approach followed in our estimation.

A second condition for the establishment of a causal relationship between treatment and outcome using DD estimation is that the after-treatment difference in the impact of the regressor on the dependent variable must be solely due to the influence that the treatment has on the outcome, as opposed to being the result of a general dissimilarity in the way that the passage of time impacts the treated and the untreated groups (Sieweke & Santoni, 2020) (Wooldridge, 2002). If this were not the case, and as then it would not be known how the treated group would have reacted had it not been treated, unobserved heterogeneity between groups induces bias in the estimates for the treatment parameters which now also include effects from the temporal divergence in how treatment groups respond to the regressor. Thus to establish causality (beyond mere association) between treatment and outcome using DD estimation, a conceptual argument is necessary to justify the assumption that the flow of time has the same effect for both treatment

groups (Wing, Simon, & Bello-Gomez, 2018); this is referred to as the “parallel trends hypothesis” in the literature, a graphical depiction of which (for a one-time intervention) is shown in the left panel of Figure 1-5:

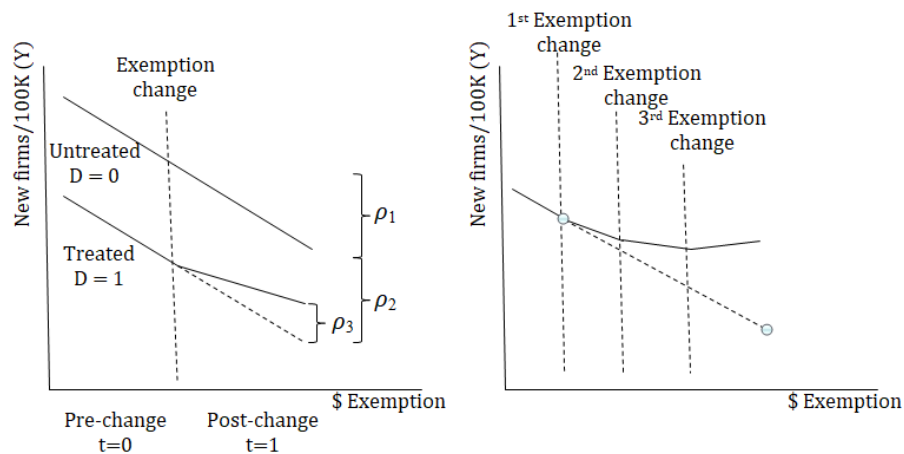


Figure 1-5: Left panel: DD parallel trend hypothesis for a one-time intervention. Right panel: unrealistic effect of causal, repeated, and persistent interventions.

A statistical test for parallel trends among treatment groups before a one-time intervention can be based on the joint significance of interactions between time and treatment dummies, which if all together cannot be found to differ from zero, indicates that the trends of both groups were not dissimilar before the intervention occurred. It is important to note however that in our case pertaining changes in the exemption statutes the interventions happen repeatedly through time, and this warrants a bit more discussion.

Recall that most states periodically revise their statutory bankruptcy exemption amounts, and that we have found that higher exemptions are in general statistically associated with fewer new firms per 100,000 people. But we also found that at the time of the statute change, rises in exemptions are associated with increases in firm creation. The right panel of Figure 1-5 illustrates what this would look like if these were persistent stimuli; this is unreasonable, as it would mean ever increasing firm creation from the constant rising of exemptions. Reality must

be such that the positive effect of the statute change is transitory, thus the need for its periodic revision. The inclusion of lagged intervention variables allows for the study of the effect of the treatment during periods subsequent its application, and as its impact on firm creation is positive when enacted, we would expect it to dissipate sometime after. In addition to these time-varying treatment effect tests, Wing, Simon et. al. (2018) discuss the use of Granger-like tests of causality for checking the robustness of the matching trends assumption in DD research design: the null that interventions have strictly exogenous impacts on outcomes, with the passage of time by itself not playing a role, necessarily implies that future interventions do not have a bearing on present results. The incorporation of leading values for the intervention can then be used to check this hypothesis, as altogether they should not be different from zero:

$$y_{it} = \alpha_0 + \rho_1 exemp_{it} + \rho_2 D_{it} + \rho_3 exemp_{it} \cdot D_{it} \quad (\text{Equation 1-2})$$

$$+ \sum_{p=1}^P [\delta_p D_{i,t-p} + \lambda_p exemp_{i,t-p} \cdot D_{i,t-p}] + \sum_{l=1}^L [\delta_l D_{i,t+l} + \gamma_l exemp_{i,t+l} \cdot D_{i,t+l}] + \varepsilon_{it}$$

Under the strict exogeneity null, it must not be possible to reject δ_l and γ_l being jointly zero for the “leads” $l = 1 \dots L$. Similarly, a transitory impact of the change in the exemption amount on firm creation would imply a dissipation of this effect in the periods following the statute change, with either a decrease in their value or absence of statistical significance. Table 1-4 displays the results of fixed effects regression of the number of new firms per one hundred thousand people, run separately on leads and lags of the exemption variables. The results of a Wald test on the joint significance of these leads and lags are the bottom:

Table 1-4: FE regressions of leads and lags of exemption variables

DV: # New Firms per 100,000 population.					
FE with lags exploring dissipation of statute change impact			FE with leads for Granger-type causality test.		
	Homestead exemption	Wildcard exemption		Homestead exemption	Wildcard exemption
	p	p		p	p
Statute change in exemption (1=Y,0=N)	-1.4476 (2.2554)	-7.8513*** (2.7342)	Statute change in exemption (1=Y,0=N)	-2.4106 (2.4924)	-9.7628 (3.0079)***
Inflation Adjusted Exemption (in \$10K)	-1.1807 (0.1752)***	-6.0626** (2.6660)	Inflation Adjusted Exemption (in \$10K)	-1.2483 (0.1804)***	-7.2176 (2.3915)***
Statute Chg x \$Exemp (interaction)	0.5689 (0.2516)**	4.2141 (2.5536)*	Statute Chg x \$Exemp (interaction)	0.7224 (0.2955)**	4.0594 .14 (2.7351)
Lag statute change (1=Y,0=N)	-1.7221 (2.1593)	-7.3907*** (2.7489)	Lead statute change (1=Y,0=N)	-2.4863 .27 (2.2477)	-6.8237 ** (3.0644)
Lag statute Chg x \$Exemp (interaction)	0.4355** (0.2222)	3.8412 .13 (2.5831)	Lead statute Chg x \$Exemp (interaction)	0.4636 .11 (0.2877)	1.1347 .75 (3.6047)
2Lag statute change (1=Y,0=N)	-0.1092 (2.2500)	-7.2859** (2.8487)	2Lead statute change (1=Y,0=N)	-1.6004 .48 (2.2881)	-3.5962 .22 (2.9309)
2Lag statute Chg x \$Exemp (interaction)	0.1187 (0.2479)	4.0691 (2.6816)	2Lead statute Chg x \$Exemp (interaction)	0.0154 .96 (0.3382)	-1.8936 .57 (3.3712)
Wald Test Joint lags all 0 (F-stat)	2.09 .12	1.91 .14	Wald Test Joint leads all 0 (F-stat)	1.41 .24	0.23 .79
R ² – within:	0.6344	0.6332	R ² – within:	0.7735	0.7656
R ² – overall:	0.2311	0.2042	R ² – overall:	0.3489	0.4290
N	901	900	N	1324	1448
Obs per group: min avg max	12 17.7 18	11 17.6 183	Obs per group: min avg max	18 26 29	23 28.4 29
Groups:	51	51	Groups:	51	51

By looking at the right panel of the table, it becomes apparent that the leads of the statute changes are nowhere near significant in the determination of the dependent variable. This is obvious when inspecting the p-values for the lead variables, and also by looking at the result of the Wald test for their joint significance: with F-statistics of 1.41 and 0.23 for the home and the wildcard exemption regressions respectively, it is impossible to reject the null hypothesis of the lead variables being all zero. This gives us grounds to affirm that exemption changes have strictly exogenous impacts on the number of new firms, and provides as good an empirical check of the parallel trends hypothesis as we can get with this data. Conceptually, as statutes change a multitude of times for every state, it becomes difficult to think of how the progress of time could have a different impact on states for which the exemption statute is about to change, as far as firm creation is concerned. Time and entity fixed effects capture heterogeneity that other

economic and demographic control variables in the model may miss, and thus we can be confident that the relationship between statutory increases in the exemption amounts and increases in new firm creation is a causal one.

On the other hand, looking at the significance of the lags after a statute change gives insight into the transitory nature of this effect. The left panel of Table 1-4 shows that for the home exemption, a ten thousand dollar increase in its amount leads to an increase in 0.57 firms per 100,000 people, which drops to 0.44 and 0.12 in the years after that. The effect is much more significant for the wildcard exemption, for which a similar rise leads to an increment of 4.21 new firms per 100,000 people, dropping to 3.84 the following year after which it dissipates. Our conclusion is that increases in the bankruptcy exemptions, especially the wildcard, are temporary stimuli that cause short-lived increases in the number of new firms created in a state, but in general profligate bankruptcy exemptions are associated with less firm creation.

1.6.2.3 The effect of BAPCPA on entrepreneurship

The Bankruptcy Abuse Prevention and Consumer Protection Act that went in effect in 2006 had an influence on entrepreneurship well beyond that of the exemption protections, according to Table-3. The passage of the law is statistically significant in explaining a decrease in the expected number of new firms that ranges from 51 to 73 per 100,000 people, depending on the model specification used. The variable is not significant in the wildcard models that do not correct for cross-sectional correlation, but as we mentioned before our tests indicate that such correlation is present in the data. We will explain the meaning of such a finding as we move on to the conclusion section of the paper.

It is important to note that since BAPCPA went into effect in 2006 (just a year before the 2007 subprime mortgage crisis hit), there is a concern that post- BAPCPA effects could be confounded with post-crisis ones. However, our model did include year fixed effects, and indeed these individual year effects were statistically significant for the years 2008 – 2014. This reassures us that the negative parameter estimate for the post- BAPCPA variable reflects the influence of the law on our dependent variable and not that of other temporal effects.

1.6.3 Robustness to Alternative Measures of Entrepreneurship

As previously discussed, the number of new non-farm non-employer businesses and also the number of new non-incorporated firms have been used in past literature as proxies for entrepreneurship. Section 1.3.2 above discusses the reasons why these measures are less than ideal for this purpose, as they include confounding factors that may not closely correspond to new entrepreneurial activity. For completeness, Table I-1 in Appendix I includes the results from fixed effects regressions ran on the homestead and the wildcard exemptions using the number of new non-employer establishments per 100,000 population. Note that only 900 observations are available for this run of the model, compared to more than 1,100 for our original dependent variable.

Results of this exercise yield statistically non-significant results for our variables of interest measuring the inflation adjusted homestead and wildcard exemptions. Indicators for the time period after the passage of the BAPCPA law and controlling for amendments to the exemption amounts also turn out to be non-significant, as is the control variable for the number of firms per 100,000 population in the state. In summary the data is not able to reject the hypothesis that personal bankruptcy law has no bearing on the number of new non-employer establishments.

This could be due to limitations of the data, as this sample is 18% smaller than the original. Furthermore, this statistic can reflect economic activity which is different from the creation of new businesses, such workforce layoffs from firms previously employing a few people, and it can also miss new business formation that is incorporated from the start.

1.7 Summary and Conclusions:

I set out to find the impact that bankruptcy relief provisions might have on entrepreneurship. I find that in general, more lenient bankruptcy exemptions are associated with fewer start-ups per-capita, which would reflect a tightening of the credit made available for such ventures. However when looking at the effects of legislated changes in the bankruptcy exemption levels, I find that increases in the statutory exemption cause a temporary increase in entrepreneurship. Moreover, this increase persists for two years after the statute's passage and then dissipates.

But the one feature of the bankruptcy legislation that I find has the greatest impact on new firms starts is the enactment in 2006 of BAPCPA. Although this amendment to the Bankruptcy Reform Act of 1978 does not alter bankruptcy exemption levels (which are decided largely by each state), it puts significant restrictions on which filers have access to a Chapter-7 bankruptcy and thus to a “fresh-start” from indebted troubles. I discover that the passage of BAPCPA unequivocally has had a negative impact on entrepreneurship that is an order of magnitude greater than the effect of the bankruptcy exemptions. This coincides with the decline in entrepreneurship dynamism that the research finds since the late 2000s, (Ryan Decker, 2014). What this suggests is that of the two features of the US bankruptcy law, the possibility of wiping the slate clean and starting anew after failure might be helpful in the promotion of

entrepreneurship, and an individual's opportunity to protect some of their wealth from repossession is not as important in comparison.

Viewed in this light, periodic upward adjustments in the statutory bankruptcy exemption levels are not justified from the point of view of fostering enterprise creation (humanitarian and welfare considerations are another matter). Their positive influence is short-lived, and the increase in exemption generosity is overall associated with a decrease in the number of start-ups which no doubt happens through a tightening of credit (White, 2005).

Instead, this analysis suggests that the unique "fresh-start" provision in United States personal bankruptcy legislation is how the law shapes entrepreneurship. This "fresh-start" is indeed the main purpose of the law, as the US Supreme Court has repeatedly asserted.

Policies that seek to encourage the creation of new firms should not so much focus on the safeguarding of some assets in the event of failure, necessary as those items may be deemed. Instead, they should guarantee an unencumbered second chance.

Chapter 2: With Nothing, But the Clothes on Their Back.

The Role of Personal Bankruptcy Protections on Homelessness: Do Property Exemptions Provide an Effective Cushion?

Synopsis

I look at the relationship between homelessness, as measured by the number of homeless individuals per 100K population in a state, and the bankruptcy laws from 2007 to 2017. I find that more generous homestead exemptions are associated with a significant increase in the average rate of homelessness. On the contrary, more generous wildcard exemptions are associated with significant and even stronger decreases in the average rate of homelessness. Economic conditions such as growth in GDP per capita have the predictable effect on homelessness which is weaker than that of the asset protections.

2.1 Introduction: personal bankruptcy in the US and its humanitarian dimension.

American exceptionalism is a polemical idea because it holds the belief that the United States is unique amongst the nations of the world in its ability, indeed in its mission, to advance liberty and justice and to uphold the dignity of the human condition. Amid the many retorts to this utopian view is the fact that when compared to other OECD nations, America is relatively tightfisted in the share of its income that it devotes to social welfare, as we can see in Figure 2-1:

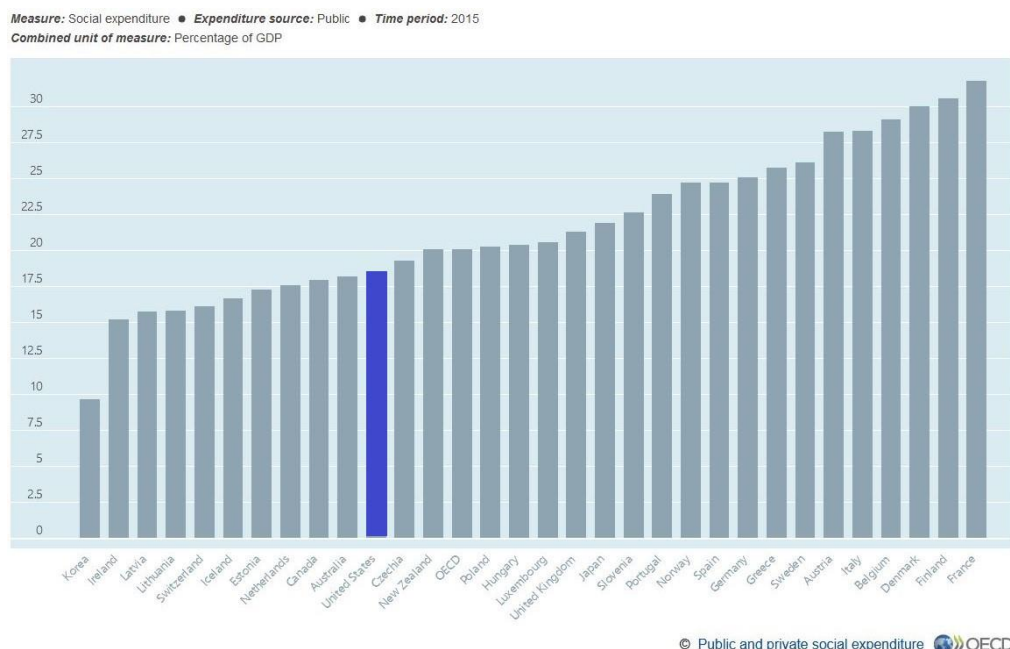


Figure 2-1: Public Social Expenditure for Largest OECD countries, 2015

Yet, this thrift is in contrast with a unique feature of life in the US that definitely sets it apart from other countries: America is exceptional in the assurance and in the breath of the forgiveness that it extends to those that have been overburdened by their debts. Only in America is a phoenix-like rise from the ashes available to the financially befallen.

Some provisions in US personal bankruptcy law prevent the total dispossession of material goods for individuals who declare bankruptcy, and as these change by state, this paper is a study of the impact that those protections may have on the rate of homelessness in different states in the country.

2.1.1 The United States Bankruptcy Law

A legal mechanism for the release of debts by financially overwhelmed individuals has existed in the United States since its inception. Other countries such as the U.K., Canada, even Russia, provide debt forgiveness to insolvent persons (Efrat, Evolution of Bankruptcy Stigma, 2006).

But in addition to debt forgiveness, US bankruptcy law is not punitive by nature and it contains other unique provisions to help the debtor with a new start. Indeed the U.S. Supreme Court has historically maintained that this “fresh-start” is the purpose of the law (*Stellwager v. Clum*, 1918).

So how is US bankruptcy law exceptional in the provision of its “fresh-start”? Whereas all other countries prevent the bankrupt from obtaining future funding and they restrict their right to subsequently engage in many public and commercial endeavors, US bankruptcy relief is swift by contrast and forbids discrimination for employment, professional, and public service matters. Most notably, the law shields filers from total material dispossession by allowing them to keep some belongings, with the intention of facilitating their new beginning.

Title 11 of the U.S. Code (1978)²² and amendments²³ governs bankruptcy and insolvency proceedings in the United States at the Federal level. “The Bankruptcy Reform Act of 1978” as is commonly known, supersedes previous versions that date back to 1800. Different ways for bankruptcy settlement are provided within the 1978 law, and this paper focuses on the asset protections contemplated in Chapter 7 which is the section that provides for the complete liquidation and discharge of debts. Immediately after a Chapter 7 filing the court forces an “automatic stay” to collections and stops the creditor from contacting the debtor. A court appointed trustee liquidates the filer’s belongings and allocates them to creditors, but –this is

²² <https://www.govinfo.gov/content/pkg/USCODE-2018-title11/pdf/USCODE-2018-title11.pdf>

²³ Amendments are: Bankruptcy Amendments and Federal Judgeship Act of 1984, the Bankruptcy Judges, United States Trustees and Farmer Act of 1986, and the Bankruptcy Abuse Prevention and Consumer Protection Act of 2005.

key- the debtor gets to keep some assets that are shielded by the law from repossession. These bankruptcy “exemptions” are different for every state.

When it comes to the property exemptions available under the law, the picture is complicated by the fact that although the 1978 Federal statute enacted a set of exclusions, it also allowed states to establish their own. An “opt-out” clause in the law lets states use their own asset protections exclusively, or to utilize them alongside the Federal ones. By the early 1980s seventy-five percent of the states had issued their own bankruptcy exemptions (Hynes, Political Economy of Property Exemption Laws, 2004) and the rest used the Federal ones. As a result, the asset protections that are available to individual bankruptcy filers in the U.S. are coded in the Federal bankruptcy law and in the different constitutions, statutes, and jurisprudence of each state.

2.1.2 Property exemptions, homelessness, and the purpose of the Bankruptcy Act.

As already mentioned, historically the U.S Supreme Court has established that the “fresh-start” constitutes the main essence of the bankruptcy law. But beyond a clean wipe of the debtor’s financial slate, the asset protections in the bankruptcy law ensure that the filer does not have to re-start from zero. Why? The 1978 Bankruptcy Act itself explains that these asset exemptions are needed in order to begin anew²⁴:

“Subsection (e) protects the debtor's exemptions, his discharge, and thus his fresh start by permitting him to avoid certain liens on exempt property.”

²⁴ Historical and Revision Notes, Senate report no. 95-989 of 11 USC § 522, regarding the lack of validity of any waivers signed on exempt property.

A different matter to consider is why the possibility of a new beginning has always been such a prominent matter in U.S. bankruptcy law. The legal field reveals two different motives that are worth discussing:

The “fresh-start” on the one hand provides a measure of insurance against unforeseen calamities to the potential entrepreneur, encouraging the acceptance of some risk that is necessary for new business endeavors (Hallinan, 1986) (Weisberg, 1986). Research has revealed that obstacles to the fresh start have had a detrimental effect on new business starts (Correas, 2021).

But the legal literature also contemplates a humanitarian aspect to the fresh start design of the law. This humanitarian dimension is put forward on its own merit (Weistart, 1977) but it is also imbued with a utilitarian slant as it is seen as a way to prevent the bankrupt from becoming a “public charge” (Sousa, 2010). F. Regis Noel in 1919, is quoted in Sousa 2010 saying:

“... society must be seriously injured by the presence of unproductive or discontented members, who through idleness or vicious habits may eventually become public charges.”

It is this later motive of the law that becomes the impetus for this paper: the 1978 Bankruptcy Act codifies for property exclusions viewed as necessary to facilitate a “fresh-start” that protects filers from penury; are these asset exemptions effective in achieving so?

2.2 Basic dynamic formulation

It is useful to picture the possible effect of bankruptcy property exemptions on homelessness in a dynamic framework in which individuals at risk can move from a state in which they are

sheltered to one in which they are homeless. For this purpose, I am going to define “sheltered” individuals as those residing in an independently provided dwelling that is not supported by public assistance or charitable enterprises. Therefore, this excludes people housed in homeless shelters, in religious charitable shelters and in public housing. “Homeless” individuals are those who are not covered by the definition of “sheltered” adopted above.

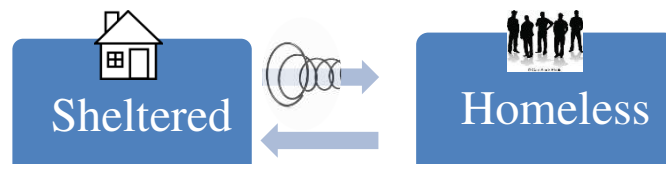


Figure 2-2: Sheltered to homeless population flow.

Bankruptcy exemptions can be seen as a buffer that offers some protection from a slide into homelessness, as it allows individuals to keep some of their possessions (in some cases even their home) should financial disaster strike. Viewed in this light, a rate of displacement β and a rate of reestablishment $\Upsilon(t)$ determine the pace at which a population enter or exits the homeless state. The whole populations of sheltered and of homeless people are susceptible to displacement and recovery, but bankruptcy protections would only help the former. We thus model a relationship between the “rate of displacement” $\beta(t)$ at which individuals lose their independently provided dwelling, and bankruptcy exemptions.

Define $S(t)$ as the number of individuals that are sheltered, all of them potentially vulnerable to becoming homeless. If $N(t)$ is the total population, then:

$s(t) = S(t) / N(t)$ is the percentage of the population that is sheltered and thus susceptible of becoming homeless.

If the number of individuals who are homeless is $H(t)$ then

$h(t) = H(t) / N(t)$ is the percentage of the population who is homeless.

And of course: $S(t) + H(t) = N(t)$ and $s(t) + h(t) = 1$.

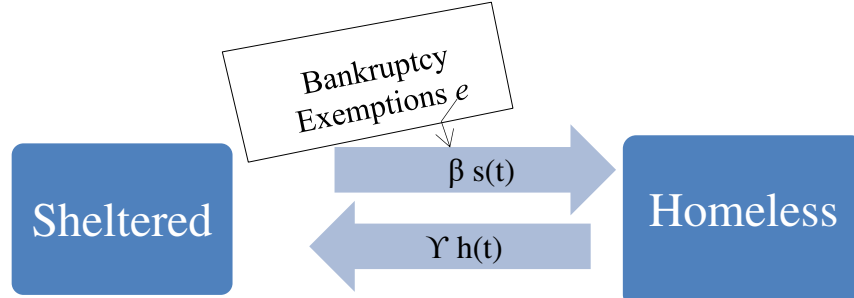


Figure 2-3: $\beta(t)$, rate of slide into homelessness.

The rate $\beta(t)$ at which the sheltered population enters homelessness depends on the level of bankruptcy exemptions e , and on economic conditions such as the growth in per-capita GDP, Δgdp . So I assume:

$$\beta = \beta(e, \Delta gdp)$$

which decreases as $e(t)$ increases $\frac{\partial \beta}{\partial e} < 0$,

and also decreases as Δgdp increases $\frac{\partial \beta}{\partial \Delta gdp} < 0$

Likewise, the rate $\Upsilon(t)$ at which the homeless population leaves its homeless state also depends on economic conditions, such as the growth in per-capita GDP, Δgdp .

So again, I assume: $\Upsilon = \Upsilon(\Delta gdp)$

which increases as Δgdp increases $\frac{\partial \Upsilon}{\partial \Delta gdp} > 0$

The evolution through time of the rates of sheltered and homeless individuals in the population can be described by three simple dynamic equations:

$$\frac{ds(t)}{dt} = -\beta s(t) + \Upsilon h(t) \quad (1)$$

$$\frac{dh(t)}{dt} = \beta s(t) - \gamma h(t) \quad (2) \quad \text{and} \quad h(t) + s(t) = 1 \quad (3)$$

And then from (2) and (3) the evolution in the population's rate of homeless through time can be re-written as:

$$\dot{h}(t) = \frac{dh(t)}{dt} = \beta (1 - h(t)) - \gamma h(t) \quad (4)$$

The relative rates at which people enter and leave homelessness will of course determine the state of the rate of homelessness in the population, which will be:

$$\text{Growing:} \quad \dot{h}(t) > 0 \Leftrightarrow \frac{\beta}{\gamma} > \frac{h(t)}{(1-h(t))}$$

$$\text{Steady state} \quad \dot{h}(t) = 0 \Leftrightarrow \frac{\beta}{\gamma} = \frac{h(t)}{(1-h(t))} . \text{ The steady state rate of homelessness is } h_{ss} = \frac{\beta}{\gamma}$$

$$\text{Decreasing} \quad \dot{h}(t) < 0 \Leftrightarrow \frac{\beta}{\gamma} < \frac{h(t)}{(1-h(t))}$$

Returning to the issue of the possible impact that personal bankruptcy exemptions may have on homelessness, and keeping in mind the assumption that protections from property repossession slow the rate at which the population enters homelessness, then as those exemptions vary:

$$\text{Assumed (-) (+)} \\ \frac{\partial \dot{h}(t)}{\partial e} = \frac{\partial \beta}{\partial e} \cdot (1 - h(t)) < 0 \quad (5) \quad \text{so that growth in homelessness slows with}$$

increasing bankruptcy exemptions. This is our main hypothesis.

$$\text{Also} \quad \frac{\partial h_{ss}}{\partial e} = \frac{1}{\gamma} \cdot \frac{\partial \beta}{\partial e} \underset{\text{Assumed (-)}}{< 0} \quad (6) \quad \text{which would indicate that the long term steady state}$$

of homelessness is lower the greater the bankruptcy exemptions are.

Likewise, more favorable economic conditions would slow the rate of growth in homelessness, as would be suggested by intuition.

$$\frac{\partial \dot{h}(t)}{\partial \Delta gdp} = \overset{\text{Assumed } (-)}{\frac{\partial \beta}{\partial \Delta gdp}} \cdot \overset{(+)}{(1 - h(t))} - \overset{\text{Assumed } (+)}{\frac{\partial \gamma}{\partial \Delta gdp}} \cdot \overset{(+)}{h(t)} < 0 \quad (7)$$

2.3 Contribution and Main Hypothesis.

It is surprising to discover that although there is literature covering homelessness in the economics, law and sociology fields, to date none of it has attempted to explore a connection between homelessness and personal bankruptcy incidence or laws. As the brief survey of the literature in section 2.4 will reveal, economic variables such as housing subsidies, mobility, home ownership and rent prices have been studied for connections to the homeless problem. The same applies to sociological and psychological factors such as substance abuse, mental health and incidence of divorce, and to legal factors such as eviction policies or criminal statutes.

The Supreme Court²⁵ and the legal literature²⁶ -as already mentioned- have repeatedly emphasized the general humanitarian intendment of the Bankruptcy Act. Yet this paper is the first and so far, the only one to explore the connection between personal bankruptcy law, property exemptions from repossession, and the rate of homelessness. As such, its contribution to the legal and economic literature on bankruptcy, and to the literature on homelessness, is to establish a bridge amongst them that brings to the surface an important relationship that had hitherto been ignored.

²⁵ (Bruning v. United States, 1964) “The general humanitarian purpose of the Bankruptcy Act provides no reason to believe that Congress had a different intention with regard to personal liability for the interest on such debts”.

²⁶ (Woodward, 1982), (Weistart, 1977), (Sousa, 2010).

A comprehensive data set on the different bankruptcy exemptions for each state was compiled which spans the years 1975 to 2018. The database catalogs in great detail not only the type and amount of the exemptions available to a bankruptcy filer (i.e. homestead, automobile, tools for the trade, retirement funds, etc.) but also whether or not these were augmented for the case of married filers, or whether the claiming of one exemption diminishes the availability of another (which is the case sometimes between the homestead and the wildcard exemption). This database by itself constitutes an important contribution to the field of the study of bankruptcy law.

The paper tests two main hypotheses that follow from equations (5) and (6):

- 1) The inflation/price adjusted generosity of the homestead bankruptcy exemption available to filers has an impact on the rate of homelessness in a state. The obvious intuition is that the more difficult it is to dispossess homeowners from their abodes, the fewer of them become homeless and thus the lower the rate of homelessness in a state.
- 2) In most states, personal property protections other than the homestead exemption exist. The ability to shield from repossession assets that facilitate an individual to earn a living (such as vehicles used for commuting or work, computers, specialized trade tools, libraries, even clothing) should make it less likely that someone who has fallen on hard times may end up destitute. I use the “wildcard” exemption, which is a monetary protection that can be used to shield any property, as a proxy for these. Therefore, the hypothesis to test will be that the higher the wildcard exemption, the lower the state’s homeless incidence.

One final point to highlight is that previous research on bankruptcy exemptions tends to test one type of property exemption or another (or even their sum) as representatives of the overall generosity of the bankruptcy regime. Here I separately include both exemptions in my

specification in order to allow for the possibility that the homestead protection may have distinct effects on homelessness than other asset exemptions.

2.4 Literature Review on Bankruptcy and Homelessness

As we survey the literature on homelessness, we will not review work that covers exemptions on their own: the literature is abundant in the legal field, but it does not delve into the issue of homelessness. Instead, let's recall what we have already established in sections 2.1.1 and 2.1.2 that the US Supreme Court itself (through its past decisions) has established the connection between property exemptions in the law that facilitate a fresh-start, and the humanitarian motivations behind them. This suffices as the motivation for our effort.

2.4.1 Economics Research in Homelessness

There are a broad range of economic topics spanned by the literature on homelessness, which covers issues like its economic consequences, labor market considerations, poverty and inequality factors, access to health care and its costs, government interventions to alleviate homelessness, housing dynamics, lack of access to human capital and other resources, and many others.

A great starting point for research on the academic literature on homelessness in general is O'Flaherty (2019). This paper is an up-to-date survey and summary of research into homelessness, and one of its main conclusions is that housing subsidies are most effective in preventing home insecurity. It recommends the use of aggregate level studies to investigate policy effects on homelessness after 2007 (when AHAR data begins), which is the strategy that this paper utilizes. For our part, we will first briefly touch on some salient topics regarding

homelessness in the economics literature, to later focus our attention on issues of housing dynamics and access to resources which are more pertinent to our discussion.

A developmental model of homelessness is presented in Susser (1993). The paper explores factors affecting young people relating to their access to resources and to other economic and demographic circumstances, taking into consideration the legal environment and other systematic conditions affecting the adult population. Using data from New York, Los Angeles and Chicago they characterize a majority of the homeless situation as being minorities, and mostly male.

Research discussing the shape and geography of homelessness has also been conducted. Local economic conditions and urbanization patterns are usually found to play a substantial role in this. Agglomeration, when it involves the concentration of poverty, is found to reduce opportunity and to increase social distress in affected areas (Cutler, 1997). This result is confirmed later by Barret (2004) when using data from the 2000 Census to study whether homelessness has remained concentrated in a few areas or if it has dispersed. Barret notes an association between the “visible” homeless population and urban population concentration. Among other conclusions, inequality and segregated pockets of poverty are found to account for a majority of homeless people.

Mild weather and inequality are found to be contributing factors to homelessness as well (Quigley J. R., 2001), and the provision of subsidized, affordable housing is proposed as a partial solution for places such as California where inclement weather is not a deterrent to vagrancy.

Health issues, especially in relation to substance abuse, have been an important focus on the research on homelessness. In “The economic costs of alcohol and drug abuse and mental illness”

(Harwood, Napolitano, Kristiansen, & Collins, 1984), a link is established for homelessness as a frequent result of mental disorders and substance abuse. More recently, two-thirds of homeless individuals surveyed in Seattle reported having medical debt that was the cause for their housing woes (Bielenberg, Futrell, Stover, & Hagopian, 2020). Medical debt is also identified as a major cause for bankruptcy in Seifert & Rukavina (2006), although homelessness is not addressed in this paper.

But literature on homelessness has also explored whether its past increases in the US were due to changes in mental health and drug abuse incidence or instead to structural changes in the housing market and in income distribution (as advanced by O’Flaherty). In the “Economics of Bankruptcy”, (Quigley J. M., 2001) uses a fixed-effects framework by county and year which includes mental health controls, and concludes that it is mostly economic factors that explain the differences in homelessness. In particular he finds that rental vacancy has negative impact on homelessness, and that higher rent to income is associated with higher rates of homelessness. The conclusion is that housing market conditions have a considerable impact on homelessness, and therefore Quigley makes a case for policies that boost the supply of housing and for housing assistance.

2.4.2 Housing Markets and Homelessness

We just discussed how past work builds a strong link between homelessness and the access to productive resources and the conditions of the housing market. The purpose of this essay is to explore the relationship between homelessness and asset protection from repossession during bankruptcy, our focus being placed on the homestead and the wildcard exemptions. A discussion about work on the dynamics of the housing market and homelessness is opportune at this point.

Of course, economists have looked at homelessness as being possibly driven by housing market conditions. For instance, O’Flaherty’s (1995) models a housing market in which income and housing prices determine the quality of housing individuals can afford. The model shows that theoretically, a lowest threshold for quality in housing could be reached which prices shoppers out of the market and thus condemns them to homelessness.

Collinson’s is the first study of evictions and homelessness (Collinson, 2018). It links individuals from housing court cases to data for NYC homeless shelter use and finds that eviction policies in NYC increase a family’s likelihood to experience homelessness to 14% vs. 3.4% for non-evicted families. The effect is persistent after 3 years. Evictions also increase visits to emergency rooms. Most surprisingly, the paper finds no evidence for eviction policy having an effect on unemployment or on an increase in public assistance spending.

More recently, work on the impact of structural housing market dynamics on homelessness has been re-taken using the newly available point in time estimates from HUD. Analysis done at CoC (Continuum of Care) level by Thomas Byrne and co-authors (2012) re-visits work from Calsyn (1994), Elliott (1991), and Quigley (2001) and finds: that rent prices and population mobility are positively associated with homelessness; that home ownership is negatively associated with homelessness; that the proportion of newly moved households is positively associated with homelessness, and so is receiving public assistance. The paper concludes: “Homeless has its roots in housing market dynamics, and particularly the difficulty in obtaining affordable housing.”

Lastly, in “Unaffordable America: Poverty, housing and eviction” Desmond (2015) looks at the economic challenges of low-income people that can lead to homelessness, and outlines housing policy considerations. Some of these policies aimed at ameliorating homelessness such as the

“Housing First” approach, which provides public housing to individuals in need, are found to have positive quality of life and community integration outcomes (Stegiopoulos, et al., 2014).

If affordability of housing and home ownership are negatively associated with homelessness, this begets the question: do protections against the loss of housing or other assets offer a safeguard against destitution?

2.4.3 Homelessness and Asset Protections in Bankruptcy

There is scant literature exploring the overlap of homelessness and bankruptcy law, and it is non-existent when it comes to bankruptcy exemptions. Much of the work pertaining the effects of bankruptcy focuses on the costs for different stake-holders (not just the home dweller).

Rebecca Diamond (2020) uses an instrumental variable approach and propensity score matching to calculate costs of foreclosure on different parties: lenders, renters and owners. It finds that costs of foreclosure are disproportionately born by owners who lose their home. These costs are in the form of housing instability (frequent moves), financial troubles, and higher incidence of divorce. The paper’s findings align with Collinson’s (2018), although it does not look at homelessness in particular.

Dobbie (2015) explores how Chapter 13 bankruptcy filers fare economically after settlement. They find that five years after a successful filing, individuals increase their earnings by 25% and that their unemployment incidence is decreased by 6.8%. Furthermore, their mortality is decreased by 30% compared to rejected filers. The paper suggests that one of the benefits of debt dismissal is an increased incentive and opportunities for work. Although this paper is close in spirit to the present work, it does not consider bankruptcy exemptions pertaining to personal bankruptcy neither does it look at the particular issue of homelessness. However, in suggesting

that debt resolution incentivizes a return to productive work, it gives support to the humanitarian aspect of the fresh-start in the bankruptcy law.

As of our last knowledge at the start of 2024, the intersection of homelessness and bankruptcy protections remains an understudied area compared to broader analysis of homelessness.

2.5 Data Description and Trends.

In studying the impact that the bankruptcy exemptions available to a person in financial distress could have on homelessness, it is important to take into consideration other covariates that are known to affect the risk of destitution as well. The geographic and time sample units also must be chosen with a regard towards availability, homogeneity and continuity of the data.

This section follows with a description of the data used in the subsequent graphical and statistical examinations of homelessness and bankruptcy property exemptions.

2.5.1 Sample Setting

Legislation about exemption amounts is the purview of each state legislature and applies state-wide. Data on homelessness and on covariates such as education level is readily available at the state level, and therefore this paper's spatial unit of analysis will comprise the fifty states in the United States plus the District of Columbia.

The period under study will be that from 2007 onwards, as that is the year when reliable homelessness counts per state are made available by the Department of Housing and Human Development. As we will see the dataset for bankruptcy exemptions covers the years 1985 to 2017, and therefore that sets the time frame of this paper's inquiry to be the ten years from 2007 to 2017.

2.5.2 Data on Homelessness

In 2001 Congress passed legislation mandating the U.S. Department of Housing and Urban Development (HUD) to contribute to the formation of a local Homeless Management Information System or HMIS (HUD, February 2007). The goal was to "allow the Department to obtain meaningful data on the nation's homeless population and develop annual reports through an Annual Homeless Assessment Report (AHAR)", according to Senate Report 109-109.²⁷

The first AHAR was published in HUD in 2007, and it represented a new development for the aggregate study of homelessness. The data provides an annual point in time count of sheltered and unsheltered homeless individuals, the counts being taken at least every other year (but almost yearly in most jurisdictions).

The strengths of this data set lie in the diversity of demographic groups covered (by race, age, marital, family and veteran status), and the variety of geographic coverage (by State, county, cities and continuum of care CoC areas).

Weaknesses are that reliable counts only start in 2007, and that the counts are performed by volunteers without enforcing authority and who could be subject to bias. This means that if this data is used as a dependent variable, there could be issues of heteroskedasticity and autocorrelation in the analysis.

²⁷ Transportation, Housing and Urban Development, the Judiciary, the District of Columbia, and Independent Agencies Appropriations Act of 2006 (PL 109-115), Senate Report 109-109.

2.5.3 Exemptions and their measure.

The codification of the bankruptcy exemption amounts, which is our variable of interest, comes with several challenges: first is that the 1978 Bankruptcy Act enacted a series of protections for the bankruptcy filer, but it permitted states to “opt-out” from them altogether and to establish their particular ones. Indeed, some states let filers pick between federal and state asset protections, although without mixing and matching. Furthermore, the property classes for which exemptions are available are varied, such as home, jewelry, tools of the trade, automobile and so on, and they differ across states. Depending on the jurisdiction and on the asset class a dollar amount might be protected, or it can be a specified number of items that is exempt from repossession (as it is often the case with wedding rings or bibles). In other cases some property may be fully shielded, such as is the case for the home dwelling or automobile for some states.

Hynes et. al. (2004) demonstrated that bankruptcy exemptions can be statistically treated as exogenous, because they are shaped by the historical perspectives of each state regarding bankruptcy. But it is still necessary to consider the following matters in deciding how to code them:

- 1) In trying to discover the possible effect that the protection from repossession of some property could have on homelessness, one encounters the challenge that some states permit bankruptcy filers to choose between federal and state exemptions. I will assume that it is the greater one that is of importance.
- 2) Married couples who jointly file for bankruptcy can double their exemptions under the federal and under a few of the state bankruptcy regimes. Some research on exemptions used the doubled amounts where this is allowed, or a weighted figure based on the state’s proportion of married population. The dependent variable in this study is the number of

homeless individuals in a state, and therefore I use the individual exemptions as the measure of the asset protections available to every person.

- 3) Another issue is picking the asset protections to include in the analysis. Past research studying effects of exemptions on economic and social outcomes has used aggregates or weighted sums of the different shielded assets. However, when it comes to the study of homelessness, the impact of protections for the home dwelling is bound to be different from that from protections afforded to jewelry, bibles or college savings accounts. Furthermore, for some asset groups the amounts shielded are sometimes subject to those already claimed for other exemptions in some states.²⁸ I will concentrate on two particular bankruptcy protections: the home exemption, which is of obvious relevance for the issue of homelessness, and the “wildcard” exemption which can be used on any property that a filer wishes to protect.²⁹
- 4) Lastly, it is necessary to consider the treatment of “full” or “unlimited” home exemptions in the jurisdictions that provide them. Past research has used ad-hoc averages for this, but I

²⁸ West Virginia’s exemptions were \$25,000 for the homestead in 2014 and an \$800 for the wildcard, but if no home exemption was claimed the wildcard jumped up to \$25,000. That year the Federal exemptions were \$22,975 and \$1,225 for the wildcard, which also increased to \$11,500 if no home exemption was claimed. In 2014 California provided for home and automobile exemptions of \$75,000 and \$3,050 respectively but no wildcard; or instead, Californians could choose an alternative bankruptcy regime in which the homestead, motor-vehicle and wildcard exemptions are \$26,800, \$5,350 and \$26,800 each.

²⁹ Tools of the trade could be another important exemption to take into account, as preserving the means to earn a living is no doubt important for avoiding destitution. The problem with quantifying this exemption is that whereas some states provide a neat dollar figure for the amount of the protection, others fully protect these assets and yet others list items that might be excluded (i.e.: professional library, plumbing tools).

will use an estimation of the top 95% priciest homes in a state, derived from the “top-tier Home Value Index (ZHVI)” from Zillow³⁰.

To summarize, the analysis will use the highest home and the highest wildcard protections that an individual bankruptcy filer can use in each given state and point in time. These will be selected from the state and federal statutes and from case precedent and constitutional sources applicable to each case.

2.5.4 Economic and Demographic factors

The rate of growth in GDP is the most important factor to account for from an economic standpoint, as it is known to be the main determinant of employment and wage growth. Likewise for unemployment, as the unemployed are more at risk of homelessness. Therefore, from the Bureau of Economic Analysis (BEA) I obtain for each state measures of unemployment and GDP growth. The state 2-year moving average unemployment rate and the GDP-per-capita and its growth are used as control indicators of the economic climate, lagged one term to circumvent possible reverse causality³¹.

I use measures of inflation as controls by themselves, but also in the adjustment to real dollars for bankruptcy exemptions amounts and for other dollar denominated economic factors such as GDP. For robustness I utilize two different metrics, one based on the Federal Housing Finance Administration’s Housing Price Index and the other one being the BLS’s Regional Price parity.

³⁰ Provided at: <https://www.zillow.com/research/data/> for every year starting in 1996.

³¹ For robustness, median household income and its growth (from the U.S. Census) were included in other specifications as indicators of economic activity, and the results obtained were no different.

Demographic factors such as population size and concentration are known drivers of economic activity³² and this could impact the incidence of homelessness in an area. There is also an association between the “visible” homeless population and urban concentration (Barrett, 2004) and, to allow for an independent link between the two, I introduce a metric of state population density per total area and per land area. These are built using US Census’s BEA data.

Lastly, to find out whether the education level in a state has an impact on homelessness, I control for the percent of population older than 24 that has at least completed education to the level of a high-school diploma. The information is available starting from 1991 from the Digest for Education and Statistics, published yearly by the National Center for Education Statistics.

2.5.5 Tax and Fiscal Setting

A higher tax burden on wages leaves less disposable income for the worker, and it makes it more difficult -*ceteris paribus*- to afford the necessities of life. But higher tax receipts can enable a government to provide public goods and services that enhance economic opportunities in a community. Therefore, I obtain information from the National Bureau of Economic Research’s TAXISM model providing the maximum Federal plus state wage tax for every year and for every state. In the next section I will describe a rough measure of infrastructure that I will use as a proxy for the provision of public goods and services.

2.5.6 Physical Infrastructure

Independently from population density, an abundance of physical infrastructure could impact the rate of homelessness in a population in two different ways: on the one hand, an abundance of

³² See (Martin P. &, 2011) on agglomeration effects and (Henderson V. , 2000).

infrastructure enhances economic activity and possibly provides for more employment opportunities, which all else equal would decrease homelessness. But on the other hand, plentiful infrastructure also provides for ad-hoc shelter for those who cannot privately provide it for themselves. I use lane-miles of highway per capita to obtain a proxy for the density of infrastructure in a state. This data was obtained from the Federal Highway Administration of the US Department of Transportation, and contains information on public use roads maintained by a public administration.

2.5.7 Miscellaneous Factors: Climate and Weather

Weather and climate could conceivably be important components determining the feasibility of a roaming or an unsheltered lifestyle. Barrett notes a tendency for homelessness to be more prevalent in temperate climes (Barrett, 2004). The average monthly temperatures in each state can be obtained from NOAA's National Centers for Environmental Information, and I include the January average temperature (in °F) to gauge the impact of climate on homelessness.

Table 2-1 provides descriptive statistics for the data:

Table 2-1: Description, sources and summary statistics of variables

Variable	Mean	SD	Min	Max	N	Source
Homeless individuals	11054.79	19919.51	337	138986	650	HUD's AHAR
Homeless per 100K	182.63	156.85	45.27	1216.18	612	HUD's AHAR
Total population	6172303	6943097	534876	39,600,000	612	U.S. Census Bureau
Population Density	346.67	1295.23	1.02	10278.83	612	U.S. Census Bureau
Annual Average Temp.	56.00	8.32	34.6	78.8	611	NOAA
Max wage tax rate	41.13	3.27	35	50.3	612	NBER TAXISM
Unemployment rate MA1	6.09	2.12	2.4	13.25	612	BEA
Inflation rate (HPI)	1.11	5.36	-23.07	17.72	612	FHFA
Percent High school 25+	87.85	3.34	78.5	93.6	561	Digest Education Stats
Percent Bachlr. 25+	29.07	6.07	17.1	57.4	561	Digest Education Stats
Real GDP growth rate	1.29	3.34	-17.51	22.35	612	BEA
Real GDP per-capita (2000)	42673.81	12646.42	30401.19	123718.4	612	BEA
Highway mls. per capita	0.0458	0.0469	0.0049	0.2695	552	US DOT FHA
Home exmp / Avg Home	1.18	1.60	0	5.29	552	Fed & State statutes & case law
Wild exmp / Med HH Inc	0.1371	0.1373	0	0.8854	560	Fed & State statutes & case law
Real GDP per-capita	36436	11950	17877	123718*	1479	BEA

NB: All variables measured at the annual, state level for the years 1985 to 2014

* Would be \$69,790 if District of Columbia excluded

2.5.8 Graphical Trends in the Data.

Since HUD started publishing AHAR data in 2007, the data has shown a decreasing trend in the point-in-time counts for the overall number of homeless nation-wide, although with increases in NY and L.A. (Dam, 2019).

Figure 2-4 below shows that this trend has happened for both the sheltered and the unsheltered homeless population:

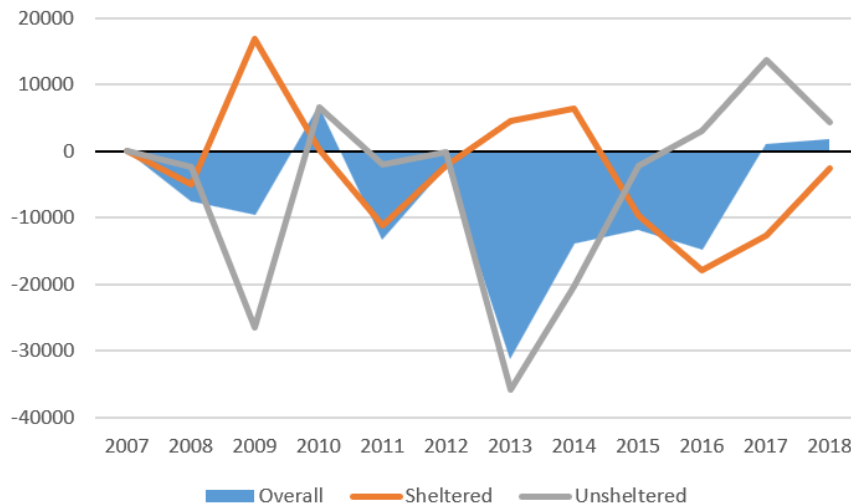


Figure 2-4: Change in Counts of US Homeless Individuals 2007-2018
(Source: HUD AHAR)

It is interesting to note that the decrease in homelessness has happened despite the financial crisis that besieged the economy from 2007 to 2009.

We next turn our attention to the evolution of the exemption amounts through time, and it becomes apparent from a cursory look at the data that the property exemption amounts have been increasing throughout the years.

Figure 2-5 plots the inflation adjusted wildcard exemption for all the 50 states, for the years 2007 to 2017. Each red dot in the plot represents one of the states in the U.S. arranged in ranking order along the x-axis according to their generosity. The rightmost dot represents the state with a higher exemption than all the other states (Florida). The leftmost one is the state whose exemption is lower than 99% of the other states.

As said, the exemption amount for the year is plotted in red, superposed on a grey shadow that represents the historic exemption amounts during past years. As we pan across the years, the red plot floats up towards the top of the historical (grey) plot, which shows how the inflation adjusted wildcard exemption has increased during the 2007-2017 decade:

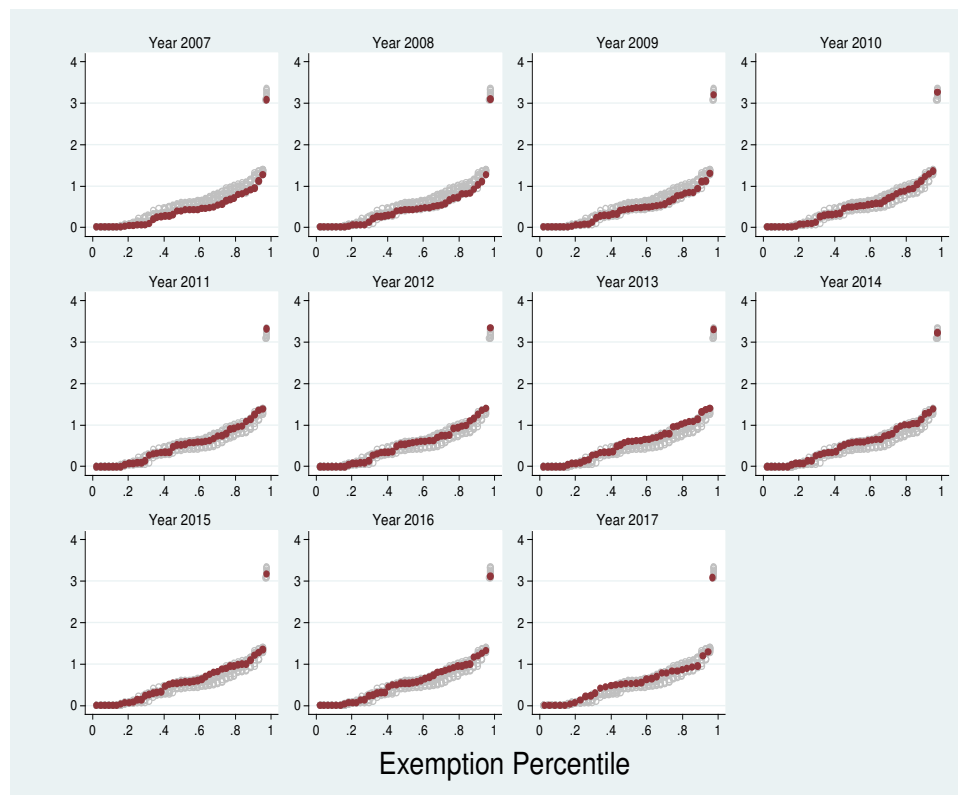


Figure 2-5: Wildcard exemption adjusted by HPI inflation.

Each red dot represents a state, with all 50 states ranked percentile-wise according to their exemption. Plot superimposed on shadow which represents the exemption amount in other years.

Although there appears to be a slight decrease in the amount of the exemptions for some of the states in 2017, the “upward float” of the red dot line makes it apparent that as the years passed, the inflation adjusted wildcard exemption got more generous in most of the 50 jurisdictions. An identical trend appears if we were to plot the homestead exemption. As Figure 2-4 and Figure

2-5 reveal a temporal reverse relationship between point-in-time individual homeless counts and the generosity of bankruptcy asset protections, they provide for some support for hypothesis 1 and 2 which were laid out in section 2.3. Let's next proceed to test these two hypotheses within a statistical framework that takes into consideration the empirical setting in which this relationship might exist, and the covariates that could also play a role.

2.6 Econometric Specification and Method of Estimation

2.6.1 The Econometric Model

I assemble a set of panel data for all the States, with the goal of testing the impact that bankruptcy exemption protections may have on homelessness incidence. The raw data covers the years 2007-2017, and in order to control for omitted variable bias I use a fixed effects model.

Equation (8) is an econometric model set up to investigate the relation between the y_{it} dependent variable (DV), which is the number of homeless people per 100K population, and the personal bankruptcy exemptions for every State and the District of Columbia for the period 2007 and 2017:

$$y_{it} = \alpha_0 + (\alpha_1 y_{it-1}) + \mathbf{X}_{it} \beta_1 + \delta \text{exemp}_{it} + \theta_i + vT_t + \varepsilon_{it} \quad (8)$$

$$i \in \{1, 2, \dots, 51\} \text{ all States and D.C., } t \in \{2007, \dots, 2017\}$$

The terms on the right-hand side of equation (8) are:

- y_{it-1} a lag of the dependent variable (dv) to be included in some specifications
- $\mathbf{X}_{it}$ a matrix of State and time-varying control variables

- $exemp_{it}$ is the inflation adjusted exemption (in \$10,000).
- θ_i and T_t are state and year fixed effects.
- ε_{it} is a vector of characteristic errors.

2.6.2 Method of Estimation and Endogeneity Considerations

Fixed effects turn out to be the adequate method of estimation as indicated by a Hausman test on the data, which is the reason why state θ_i and year T_t terms are added to the econometric set up in (8).

Endogeneity issues arising from correlation between explanatory variables and the error term can result in biased and inconsistent estimates. Its main causes are “simultaneity bias” and “omitted variable bias”:

Simultaneity bias can arise when the dependent variable is also a predictor of the regressor, but this is not an issue in our model because our variable of interest - the legal policies regarding bankruptcy exemptions, is an exogenous product of the legislative process. It would be very unlikely for the increase or decrease in the incidence of homelessness in a state to be the driver for a change in the legislated bankruptcy exemptions.

Omitted variable bias can happen when significant predicting variables are excluded from the model and these variables are also correlated with other regressors, yielding inconsistent regression estimates. Fixed effects models focus on the variation within each group, and therefore solve this issue.

2.7 Estimation Results and Discussion:

Table 2-2 shows results from the regression of homeless individuals per 100,000 inhabitants as dependent variable for each state-year combination. Nominal GDP is used as one of the controls in the first and the second column, whereas Real GDP is used in the third and fourth; A year trend variable is included in the regressions without “year” fixed effect terms.

Table 2-2 : FE cluster regression results, DV: Homeless per 100K population

	State & yr FE	State FE	State & yr FE	State FE
Population Density	0.09302 *** (0.01687)	0.1016 *** (0.01674)	0.0924 *** (0.0170)	0.1006 *** (0.01677)
January Temp °F	-2.7976 ** (1.2254)	-1.5107 (1.0401)	-2.4605 ** (1.2246)	-1.4845 (1.0418)
Max wage tax rate	-4.5713 (3.3512)	-0.4210 (1.1048)	-5.1309 (3.3652)	-0.3044 (1.1033)
GDP growth rate	-1.9176 *** (0.5761)	-1.0305 ** (0.4826)	0.0022 *** (0.2240)	-0.7720 * (0.4612)
Nominal Real				
Inflation rate (HPI)	-2.1681 *** (0.4603)	-1.9535 *** (0.4031)	-2.2898 *** (0.4598)	-2.0442 *** (0.3988)
Housing cost (HPI 2000)	0.5405 *** (0.1298)	0.4095 *** (0.1146)	0.5455 *** (0.1306)	0.4227 *** (0.1145)
Percent High school 25+	-4.4277 * (2.5586)	-3.7643 (2.5520)	-4.6023 * (2.5741)	-3.8633 † (2.5590)
Real GDP per-capita	0.0025 *** (0.0007)	0.0022 *** (0.0007)	-0.0022 *** (0.0007)	0.0021 *** (0.0007)
Highway mls. per capita	-830.2824 (675.2044)	-1617.954 ** (656.136)	-1081.988 † (1.0865)	-1673.832 ** (669.793)
Home exemp / Avg Home	26.1856 *** (8.1135)	30.4180 *** (8.0307)	25.9300 *** (8.1607)	30.2757 *** (8.0468)
Wild exemp / Med HH Inc	-226.9297 *** (46.7138)	-219.3908 *** (46.8502)	-230.0713 *** (47.0279)	-221.9574 *** (46.9437)
Significant year FE OR	2008, 09, 11	2.4458 * (1.3429)	2008, 09, 11	-2.4030 * (1.3510)
year trend (if no yr FE)	all -		all -	
R ² : within between overall	.380 .719 .704	.349 .673 .658	.373 .713 .698	.346 .671 .656
N	542	542	542	542
Obs. per group: min avg max	7 10.6 11	7 10.6 11	7 10.6 11	7 10.6 11
Groups:	51	51	51	51

Significance: *** 1% ** 5% * 10% † 12%
Fixed effects (state and year) panel estimates using Stata command xtreg with cluster() option

2.7.1 Estimation Considerations

We are not concerned with endogeneity issues in relation to our variables of interest because it is unlikely that the rate of homelessness impacts the legislated bankruptcy exemption amounts.

However, possible multicollinearity between our exemption regressors warrants a more detailed discussion, as the different exemption amounts are often revised together by state legislatures. Keeping in mind that multicollinearity between regressors does not bias the estimates but instead inflates their standard errors, and that in all our models the exemption estimates turn out to be very strongly statistically significant, this is then a non-issue unless we are interested in obtaining confidence intervals for the bankruptcy exemption parameters. Nevertheless, Variance Inflation Factor statistics for the homestead and for the wildcard exemptions are 2.30 and 2.48 respectively, comfortably below the commonly agreed threshold for concern which is three. Together with obtained overall R^2 values ranging from 0.65 to 0.70 in all our models, we are comforted regarding the general fit of the estimation.

2.7.2 Impact of the Controls on the DV.

Turning our attention first to the variables controlling for socio-economic effects, education turns out to have the largest impact on the DV: an increase of 1% if the population 25 and older obtaining a high-school diploma is associated with an expected decrease in homelessness of roughly 4 per 100K people. Although this result is significant, it is not very dramatic - yet it is the most pronounced among the social and economic controls considered.

Next, although real GDP per capita appears to have miniscule and also contradictory results on the DV across specifications, the effects of its growth rate are less ambiguous: a 1% growth in real GDP growth to an expected decrease in the number of homeless individuals of almost 2 per 100K population. A result of similar magnitude and direction (consistent across specifications) is also apparent for the inflation rate. In addition, there is a positive impact of housing costs on

homelessness that by itself is even smaller than that of the previous variables, albeit very clearly statistically significant. Tax rates on the other hand do not appear to have an effect.

All in all, the resulting effects on homelessness of the economic variables are what intuition would have led us to anticipate, namely that more favorable economic conditions result in a decrease in the overall level of homelessness as was encapsulated in equation (7).

Another variable to consider is climate, as harsher weather conditions are more inhospitable to unsheltered living. However, an increase in the January temperature of 1°F is associated with a statistically significant expected decrease in homelessness of 2 per 100K people on average, although this result is not significant in specifications that include a time trend variable.

But of all the demographic and socio-economic covariates considered it is surprising the result gleaned from the one controlling for non-local highway lane-miles per capita: this result is not significant in every specification, but every unit increase in this variable is associated with an expected decrease in homelessness of roughly 1,600 hundred individuals per 100,000 population. Let's keep in mind that population density is separately controlled for and this variable is included as a proxy for the level of infrastructure in a state, which suggests that there might be an inverse association between capital infrastructure and homelessness. But statistical significance is absent in two of the four specifications which precludes from drawing definitive conclusions.

2.7.3 Effects of Bankruptcy Property Exemptions on Homelessness.

Recall that two different kinds of bankruptcy protections, the homestead and the wildcard exemptions, were simultaneously included in the statistical model in order to allow for possible distinct effects. The regression results indeed demonstrate that the two exemptions have strong

and opposite impacts, and their effects are the most consistent and compelling among those of all the variables considered:

2.7.4 Homestead Exemption

More generous homestead exemptions are associated with a significant increase in the average rate of homelessness. Each 1% increase in the value of the home protected from repossession, is linked to an expected increase in homelessness that ranges between 25 and 30 per 100,000 population. The result is strongly statistically significant across the different specifications.

When trying to make sense out of this paradoxical result it would behoove us to ponder that the homestead bankruptcy exemption benefits only those individuals who own their residence, obviously. Therefore, a positive effect of higher homestead exemptions on homelessness could be due to:

- The protection applying to people that are wealthier and have more assets to begin with, and thus are far from the point of becoming destitute.
- Protections from repossession of the home could lead to increased demand for residential investment, which could drive up housing prices.

2.7.5 Wildcard Exemption

In contrast with the positive association between homestead protections and homelessness, more generous wildcard exemptions are associated with significant and even stronger decreases in the average rate of homelessness: each 1% increase in the wildcard protection - as a % of median household income - decreases homelessness on average by 219 to 230 individuals by 100,000 population.

The wildcard protection can be applied to any property, and conceivably it would help people shield from repossession property that is used in earning a living, such as professional tools, library, wardrobe, electronics, or means of transportation. In many jurisdictions there already are targeted exemptions for such property, but the significance of the wildcard exemption is that it can be used at the discretion of the filer to safeguard those assets that are most important to them, facilitating the “fresh-start” that personal bankruptcy law avouches.

Of all the variables considered in our study for possible impacts on homelessness, bankruptcy protections are the strongest and most statistically consistent of the lot.

2.7.6 Lagged Regressors.

It is reasonable to think that the impact of the regressors on homelessness counts may not be contemporary. In order to take this into consideration, the models from Table 2-2 were also run using lagged values for the regressors. The results yield similar results, with comparable overall and between R-square measures of fit, but slightly reduced “within” metrics. Most importantly, our variables of interest (the homestead and wildcard exemption) have almost identical parameter and significance estimates, and (except for GDP per capita which turns out to be non-significant) the same is true for the rest of the control variables.

2.8 Summary and Conclusions

The goal of this study was to figure out whether asset exemptions from repossession help bankrupt individuals avoid destitution thus facilitating the “fresh-start” that bankruptcy law has enshrined as being its main *raison d’être*. Bankruptcy asset protections vary widely across states and throughout time, and I focus on the two which are more easily quantifiable and which could

potentially have the most impact for avoiding homelessness: the homestead and the wildcard exemptions. The findings are paradoxical as even if both protections are found to have an important influence on the rate of homelessness in a state, their effect is opposite: whereas more generous wildcard protections have a strong contribution in the reduction of homelessness, the opposite is seen for the homestead exemption. An explanation for the findings could be that the homestead exemption only protects individuals who are home owners, and as houses are typically the most valuable assets for most private individuals, these protections would be applicable to people that are further away from homelessness than those who do not own their residence. In addition, homestead protections could divert more assets towards residential investment, increasing its price. On the other hand, wildcard exemptions can be used on any asset at the discretion of the filer, who would naturally seek to shield the items which are most necessary to continue earning a living. The wildcard protection as a percentage of household income is indeed found to be the most important factor in preventing homelessness, more so than education, GDP growth, taxes, and other considerations that have been investigated in the past.

What this study has shown is that bankruptcy law and its different implementation across the states in the U.S. is a crucial determinant of the rate of homelessness that has hitherto been ignored by the research in the field. This is important, as the “fresh-start” from bankruptcy is an ideal that has been enshrined in the law since the 19th century. State bankruptcy exemption policies should be aimed at allowing individuals to walk away from hardship with the ability to pull themselves back up to self-sufficiency. The homestead exemption does not satisfy this role, as home ownership represents an investment and is not needed for self-reliance. The wildcard exemption does, and so would other protections that allow people to keep the things that will help them in returning to productive life.

Chapter 3: Size Matters: Does the Concentration of Employment in Big Firms Affect New Business Formation? A Test of the Chinitz Hypothesis

Synopsis

This essay looks at the effect that employment concentration in large institutions, regardless of industry, has on new business start-ups. Using county level panel data on private and public employment and an instrumental variable approach, the concentration of jobs in large firms and in the public sector is shown to have a detrimental effect on the creation of new firms.

3.1 Introduction: Big Firm Employment Concentration in the US.

Sir Isaac Newton said to have been able to see far by standing on the shoulders of giants. On the other hand, during his travels, Gulliver felt smothered and unable to thrive in their land. This essay will look at the impact that employment concentration in large firms (defined as those with 500 or more employees nation-wide) may have on the number of new firm births.

From the time of the first settlers in the Americas, newcomers to the U.S. are often surprised by its oversized nature (Hennepin & Tonson, 1698). This is true regarding its geography, its fauna, its cities and even the size of everyday items, and it applies to the size of U.S. companies as well: large businesses dominate the US labor landscape, employing 52.9% of the workforce as of 2015³³. A breakdown of US employment by business size for the period from 1995-2019 can be seen from Figure 3-1 below:

³³ <https://www.census.gov/content/dam/Census/library/publications/2015/econ/g12-susb.pdf>

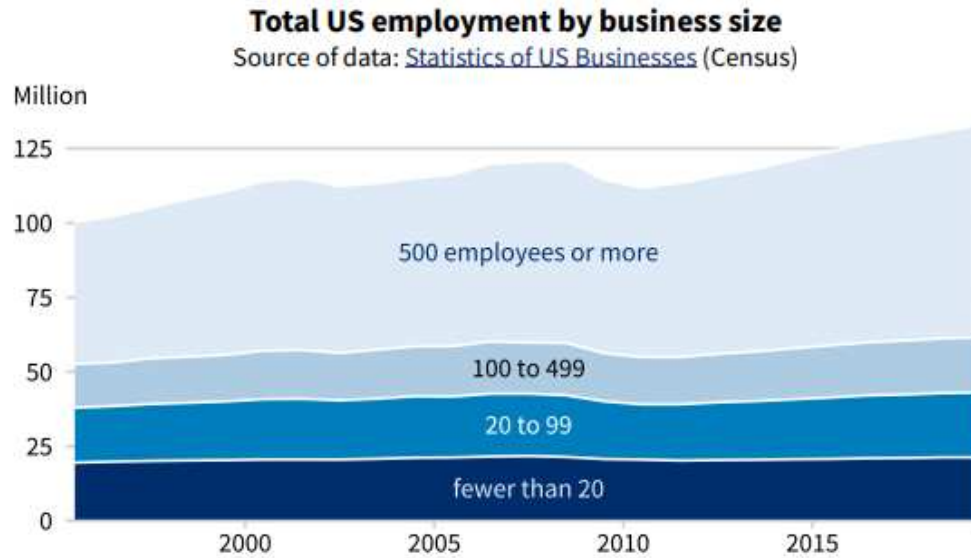


Figure 3-1: US Employment by Business Size (Employees), 1995-2019
Source: (Office of Advocacy, 2022)

This concentration of employment in big firms is unique to the USA among the other OECD countries. Compared to other large economies, a much higher relative number of the US work force is employed by big firms, as can be seen by looking at Figure 3-2 below:

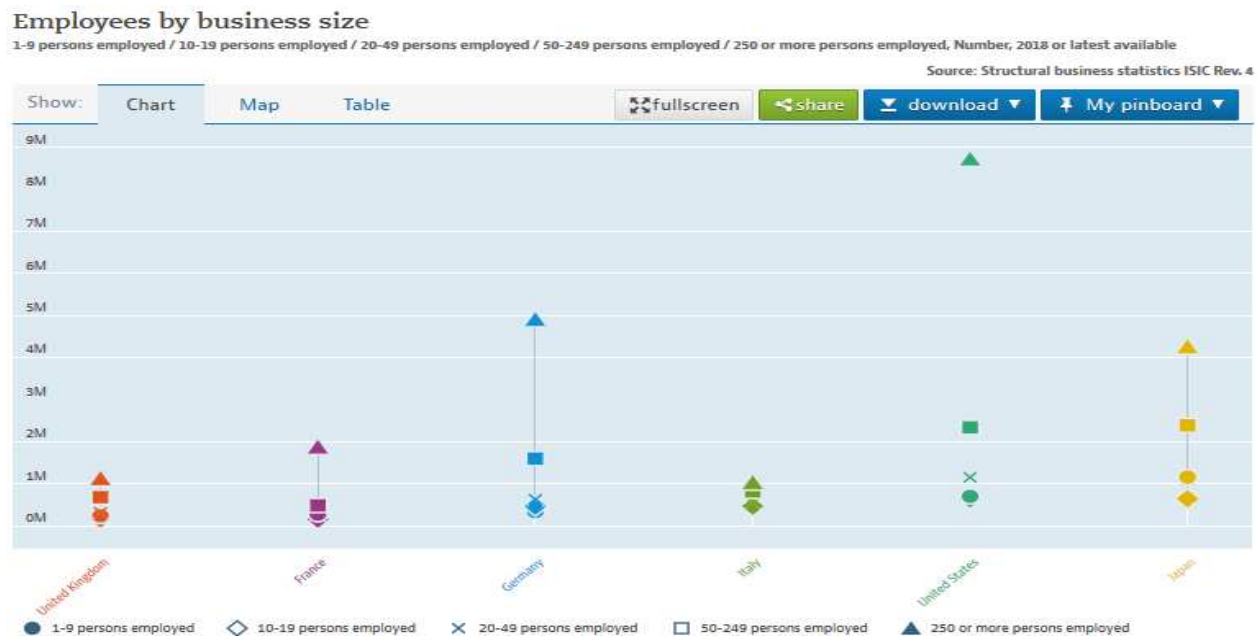


Figure 3-2: Employment by Business Size (Employees), 2021, 6 largest OECD Countries. Source: (OECD, 2023)

However, while the percentage of employment in large enterprises has been on the up-rise³⁴ since the late 1990's, entrepreneurship has been on the decline as Figure 3-3 shows:

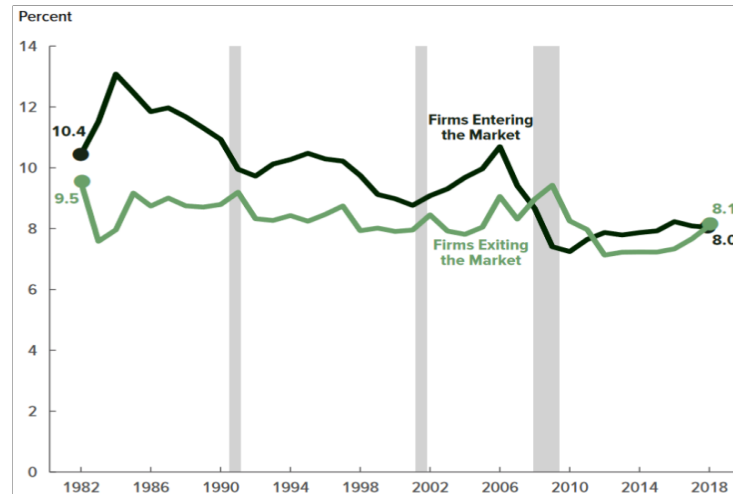


Figure 3-3: Rates at Which Firms Entered and Exited the Market, 1982 to 2018.
Source: (Musick, 2020) Congressional Budget Office

Studies on industry agglomeration and its relationship to entrepreneurship abound and are part of a prolific field in the Economics literature; but a related issue worthy of consideration is whether or not the concentration of employment in big firms, regardless of the industry where this happens, has by itself economic consequences. For instance, if large firms have distinct advantages in their ability to attract employees, it might be difficult for start-ups to find the human capital to launch a new business. In these areas where large employers dominate, there might be monopsony labor pricing power which might be of concern for entrepreneurs and laborers, although the testing of this hypothesis falls out of the scope of this essay.

³⁴ *ibid*

3.2 Literature Review on Concentration and Entrepreneurship

3.2.1 Entrepreneurship in the Economics Literature

Entrepreneurship impacts regional economic growth and economic development in general. The field of entrepreneurship has historically been an interdisciplinary sub-discipline of many academic fields, mostly Economics but also in business administration, sociology, geography and other social science branches. In Economics, there is a large body of work that seeks to explain the dynamics of new firm creation, and this section provides a short overview of such efforts.

3.2.1.1 Entrepreneurship and Growth Theory

Along with the obvious impact that the creation of new businesses has on the creation of jobs, an understanding of the economic relevance of entrepreneurship can start with a review of its fit into the literature of endogenous economic growth. To explain the development gap between economies, in the 1980s endogenous growth theory develops the idea that technological growth is the driver of economic growth. This departed from neoclassical tradition that modeled growth as the result of a process of accumulation of labor, capital and technology which was left unexplained. The neoclassical assumption of diminishing returns to labor and capital implied that the only explanation for the divergence in economic development was technological growth (Solow 1956, 1957). Nevertheless, the theory did not attempt to explain the drivers for this continuous technological enhancement, and it was modeled as a given, exogenous factor.

A few decades later, innovation that is spurred by knowledge is put forth as the main reason for economic growth. The nascent literature of endogenous growth identifies knowledge driven innovation as the principal reason for technological driven development. Externalities and

spillovers in production shape this knowledge, which explains the growth in technology that neoclassical theory took as a given (Romer, 1986), (Lucas, 1988).

Entrepreneurship is built into the theory of endogenous growth later, modeled as the connector between technological know-how and growth as a spillover result from human capital accumulation (Acs, Audretsch, & Lehmann, 2013). The central theme is that R&D creates knowledge externalities that result in new entrepreneurial opportunities, which cements the role of entrepreneurship in the explanation for economic growth.

A different approach for integrating entrepreneurship into the endogenous growth framework is to view it as an additional factor of production instead of modeling it as an externality. If cultural and institutional differences between societies regarding entrepreneurship are taken into account (Hofstede, 2000) then the legal, cultural and institutional aspects of society that foster entrepreneurship can be seen as “entrepreneurship capital ... [: a] capacity for economic agents to generate new firms” (Audretsch D. B., 2004). Viewed in this light, entrepreneurship capital is a factor of production that is not accounted for in the neoclassical production function and that constitutes an overlooked contributor to the divergence in economic achievement. The authors indeed empirically find a significant contribution of these cultural and institutional factors in predicting differences in production amongst German regions.

But in addition to its impact on economic growth, entrepreneurship is also viewed as directly contributing to job growth by itself. Policy impediments to it in the form of higher start-up costs result in lower levels of employment, which is illustrated by equilibrium models of job creation where entrepreneurs and workers have different interests (Fonseca, 2001).

Entrepreneurship has become a fertile field of its own in Economics, and thus we move on to explore its connection with the economics of agglomeration.

3.2.1.2 Entrepreneurship and Agglomeration Economics

When investigating a possible connection between employment concentration and entrepreneurship, the literature on agglomeration economics becomes the first obvious go-to source. Let's keep in mind that at the core of agglomeration economics is the idea that geographical distance has consequences on a myriad of economic forces, from input and product transport costs, to the ease of flow of information and factors of production such as capital and labor, to the access to amenities and pools of knowledge, which all together result in the clustering of economic activity. In the words of Paul Krugman:

“Step back and ask, what is the most striking feature of the geography of economic activity? The short answer is surely *concentration*.” (Krugman, 1991)

Krugman alerts his readers to this concentration of production being the telltale sign of increasing returns at play. Yet the notion goes back to the early 1960's, when the idea is put forth that a diversity of small businesses leads to a more dynamic economy because it supports a network of input providers, and this can facilitate the sprouting of new start-ups (Chinitz, 1961). Drawing from the New York Metropolitan Regional Study and from the Pittsburgh Economic Study, Chinitz tries to isolate the individual factors driving the economies of each region and the networked connections between industrial sectors with one another. In his 1961 paper Chinitz calls for the development of a production function relating the size/economies of scale of an industry to that industry's particular industrial structure, instead of just focusing on an industry's size by itself.

The “Chinitz’ hypothesis” (as has become known) has garnered a host of interpretations: early takes on this idea see it as meaning that the economics of agglomeration are a result of lack of industry diversification (Carlino, 1980). However, more modern readings consider the more accurate interpretation of Chinitz to be that firm size (and not lack of industry diversification) is the true driver of the economics of agglomeration (Evans, 1986). Further developments on this view portraying the Chinitz hypothesis as centered on the size of firms, regard firm concentration as measured by industry size as the gauge for a localized economy (Moomaw, 1985). Whereas cross-industry influences have been found to be one of the drivers of this (Hanlon & Misco, 2014), other entrepreneurial spillover factors (Rosenthal & Strange, 2010), as well as personal connections, financial and marketing networks and the size of markets have also been determined to be of significance (Duranton & Kerr, 2015). Nevertheless, as already stated, it is the work of Chinitz that establishes a link between the budding of new start-ups and the abundance of small businesses.

In 2009 Glaeser tests a series of hypothesis about the drivers of entrepreneurship in the area of manufacturing, and finds that although clustering matters, diversity on its own does not (Glaeser E. L., 2009). He finds a weak role for demographics and culture in entrepreneurial activity, which contrasts with the aforementioned analysis by Hofstede for German regions in 2000. However local start-up costs and the existence of a specialized labor pool in a given industry are found to be strong predictors of manufacturing entrepreneurship which underscores the importance of local factors. Note how “specialized” labor rises to prominence here.

How about the effects of other localized factors that could impact the birth of new start-ups around a concentrated area? Using mining as an instrumental variable for entrepreneurship in employment growth regressions, entrepreneurship is found to create information externalities

about the condition of the local market place (Bunten, Weiler, Thompson, & Zahran, Entrepreneurship, Information, and Growth, 2015).

Agglomeration economics, labor concentration and entrepreneurship:

When reviewing the literature that explores the topics of agglomeration economics and entrepreneurship, we can separate it into two different categories depending on the direction of the relationship being researched: a portion of this work explores the impact of entrepreneurship on local economies and how the degree of local agglomeration can alter this effect, whereas a different tranche of the research looks at how agglomeration itself can nurture entrepreneurship through knowledge externalities, networking effects and labor market efficiencies. Chinitz's hypothesis fits in this latter category. Regarding the role of agglomeration on the effects of entrepreneurship, recent work finds the impact of new start-ups on the local economy to increase with population density (Baptista & Preto, 2011) (Henderson & Weiler, 2009). Entrepreneurial effects are weak and even negative in rural areas (Fritsch & Mueller, 2008).

The macroeconomic impacts of new firm formation are shown to depend on local economic factors, as the economic effect of a new business is shown to decline or to be negative in areas where entrepreneurship has reached a rate of equilibrium (Carree, van Stel, Thurik, & Wennekers, 2007). Local institutions, whether they are formal centers of learning and research or informal factors such as local customs and culture, are also shown to impact the economy through entrepreneurship (Aparicio, Urbano, & Audretsch, 2016), with Urbano et al. (2019) showing that culture and social norms are responsible for the lion's share in the relationship between new business creation and economic growth. Holmes and Stevens (2002), (2010) show that small establishments in the service sector tend towards agglomeration more so than those in the manufacturing sector.

As we move on to explore the literature that tries to explain how agglomeration itself can be itself the driver of entrepreneurship, a good place to begin with is studies on employment concentration (as this is most related to the issue that we explore with this essay). When looking at the influence of the level of employment by itself on entrepreneurship, county employment density defined as employment per acre is found to increase in the productivity of labor in a state (Ciccone, 1996) . Indeed, half of the variation in productivity across states can be explained by the density of employment at the county level.

We previously talked about how knowledge as a driver of economic growth is one of the central pieces in the theory of economic development. The agglomeration literature shows how the concentration of know-how in local areas by industry leaders and research centers facilitates the exchange of ideas and stimulates entrepreneurship. Audretsch and Feldman (1996) propose that local externalities, although limited to the area where they are originated, are generated from R&D and the dissemination of specialized knowledge. In later work the same authors find that variety in the local economic environment of an area creates regional knowledge diffusion, as it draws close interdependent industries (Audretsch & Feldman, 1999).

Agglomeration is also shown to facilitate new businesses' access to specialized inputs (Duranton & Puga, 2020), and to increase labor market efficiency through diversification, competition, mobility and the preservation of skills (Audretsch & Feldman, 1999), (Fritsch M. , 2017). Lastly, agglomeration creates opportunities for the development of networks that allow enterprising individuals to connect with other peers, mentors, and possible clients, which provide resources and also information about market niches and likelihood of success (Eriksson & Lengyel, 2019), (Peng, Li, & Liu, 2022). However, technological connections which network

economic actors can substitute for a lack of geographical agglomeration, as shown by Johansson and Quigley (2004).

But more similar to the question that we are exploring is Rosenthal's analysis where agglomeration economics are modeled as the result of the sharing of a public good (Rosenthal S. a., 2010). This public good is of use to small establishments (defined by the size of their labor force), but large establishments do not need to make use of it due to their depth in resources. Stronger agglomeration economics are the result of an economy that is preponderantly comprised of small establishments. They test by regressing (at the census tract level) births of small establishments (<10 employees) against the employment in establishments of certain employment size in all industry and in the same industry, within 1 and within 5 miles. They find that there is more entrepreneurial growth in places where small and medium establishments are predominant. However, there are two issues that might be important yet not considered in Rosenthal's analysis:

- Public employment does not enter into consideration at all. It is possible that the share of the labor force that is employed in the public sector could impact the provision of the public good (or its consumption) that is at the core of this model of entrepreneurship.
- The analysis looks at the impact of the raw number of companies of employers of a given size on the level of start-ups, and not at their proportion as a total size of the labor force.

The relationship between establishment start-ups and the intensity of labor in different industries is also examined by Glaeser (2010), who uses labor intensity (a ratio of payroll to total sales revenue) to gauge how cost factors can influence the creation of new enterprises. Glaeser

finds that entrepreneurship (measured as the number of employees in new establishment start-ups) increases when it takes place in areas in which there is an abundance of smaller establishments. Growth of employment in start-ups is thus predicted by the predominance of smaller sized establishments in an area, but again this analysis is ignoring the two factors that we pointed out above when reviewing Rosenthal's (2010) work. And again, as in Rosenthal, it is the total number of firms of a given employee size in an area that Glaeser is interested in, not their relative share in the total local labor pool.

Lastly looking at the percentage of employment in large firms, recent work points at how it has increased since 1978 by 6% (Hopenhayn, 2018). The study finds that a slow-down in population growth can explain the long-term decline in firm entry rates and the concentration of employment in large firms (Hopenhayn, 2018). This population growth rate is not taken into account in the two models previously described.

3.3 Contribution and Main Hypothesis

This essay adds to the labor economics and the entrepreneurship literature in that it considers the effect that employment concentration in large firms by itself (regardless of industry or sector) may have on discouraging the sprouting of new business in a manner similar to the way that “company towns” of the past would limit opportunities to outsiders. In addition, the analysis distinguishes between employment in the private and the public sectors, and explores the possible different effect that they could have on entrepreneurship. The core hypothesis is that employment concentration in large firms (those with 500+ employees nationwide) discourages the formation of new business because it makes the access to labor pool and other resources more difficult for entrants.

The paper can be viewed as a test of the Chinitz hypothesis when interpreted as postulating that average firm size is the driver of agglomeration economics, but using employment concentration (rather than market share) as the predictor of new start-ups. The approach is novel because it incorporates two predictors of entrepreneurship in the form of the concentration of labor force employment in firms of a given size and in the public sector, into a model that contains a host of other factors that are known contributors or inhibitors to entrepreneurial start-ups.

Lastly, since a measure of price variability across counties and through time which is not available from Bureau of Labor and Statistics, this essay builds a time and county spanning index of prices based on the Housing Price Index and on Zillow’s Home Value Index. This metric provides a basis for the comparison of dollar denominated statistics which we can use as controls in our analysis. Section 3.5.5 will discuss how although this figure may not be a perfect proxy for the changes in the cost of living for counties through time, it is nevertheless well suited for use as a purchasing parity price benchmark across counties. On the other hand, the use of annual index

variables in our statistical analysis can capture the effects of years in which a bubble in real estate pricing can distort our metric's ability to accurately capture changes in the cost of living.

3.4 Defining employment concentration and its geographic scope

We would like to explore whether the share of employment concentrated in larger firms (regardless of industry) has an impact on entrepreneurship starts. In order to do this, we need to figure out a way to define this concentration.

3.4.1 Enterprise Employment Size

One way to look at employment concentration in an area is by looking at Enterprise Employment Size. According to the US Census, since 2004 the percentage of employment in large enterprises has been on the up-rise³⁵. The majority of employment in the US is concentrated in large enterprises, as the figure above showed. Our analysis then will look at the percentage of the labor force that is employed in firms of a given size. But in order to achieve this, the first question then is how to classify firms according to size. The answer will be driven by the data available, as we will see below.

3.4.1.1 Different Classifications of Employment Size:

A challenge arises when trying to decide how to determine classification categories for the different enterprise employment sizes, because what qualifies as a “large” or “medium” enterprise must meet different criteria according to the institution doing the classification.

³⁵ <https://www.census.gov/content/dam/Census/library/publications/2015/econ/g12-susb.pdf>

The EU classifies enterprises as³⁶:

- Very Large: More than 500 persons employed:
- Large: 250 to 499 persons employed.
- Medium size: 50 to 249 persons employed.
- Small enterprises: 10 to 49 persons employed.
- Micro enterprises: fewer than 10 persons employed.

The US Census classifies enterprises by size according to the following criteria:

- Large enterprises: 500 or more
- Medium enterprises: 100 to 499
- Small enterprises: 20 to 99
- Very small enterprises: Fewer than 20

The OECD classifies large enterprises as those having 250 employees or more, and yet another classification in the US is done by the U.S. Small Business Administration, which has different criteria for classifying business according to size which vary by industry yet calls all businesses under 500 employees “small.” For consistency this paper will consider “large enterprises” as those with 500 employees or more, and as much of the data we will draw upon for our analysis comes from the U.S. Census, we will follow their employment size classification.

³⁶ https://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Enterprise_size

3.4.2 The issue of public employment:

Keeping in mind that the goal of this exercise is to determine whether concentration of employment in a geographical area changes the labor market conditions that could affect the start-up of businesses ventures, it is important to consider the role that employment in the public sector could also play. Three options are evident:

- Given the private market nature of entrepreneurship, public employment could be left out of the analysis and the focus could be on jobs in the private sector only. This has been the approach followed by previous literature.
- Jobs in the public sector could be treated as those in the private sector, and their amount added to their aggregate.
- The percentage of the labor force in public employment could be analyzed by itself so that any discernible effect it may have on entrepreneurship different from those of the private sector could be gleaned.

Public employment is different from private employment in several aspects, the most notable being that the latter is profit driven whereas the former is not and is instead directed to the provision of public services. As such, hiring and firing of personnel is driven by different dynamics in both sectors. In addition, compensation follows different patterns: in the public sector pay and benefits are typically tightly regulated without much prospect for bargaining, and often includes pension benefits which employees can fully access after 20 years of service. The public sector often also offers substantial medical coverage that few private sector positions match. Because of the obvious differences between employment in both sectors, we will follow the third approach and consider government employment on its own. This will allow us to

explore whether or not employment in this sector has a different impact by itself on the amount of business start-ups.

Federal vs. State and Local Employment:

To account for the whole of public sector, it would be ideal to be able to distinguish between employment at the Federal, State and local (county and municipality) level. Military personnel is not part of the “civilian” labor force as defined by the Bureau of Labor and Statistics³⁷ and as such we will ignore it. On the other hand, civilian Federal employment could be a sizeable part of the total employment population in a county such as the District of Columbia. The problem is that Federal employment is not available from the data that we will use to determine employment size. Consequently, the public employment category that we will use in our analysis will include only employment at the State, county and municipality levels, and as the data does not distinguish among them, our figures will be the aggregate of these.

3.4.3 Geographic scope

Data for employment exists at the national, state, county and metropolitan statistical area (MSA) levels, but employment and entrepreneurship are mostly local phenomena by nature³⁸. As such, it makes sense to focus the study on the issue of entrepreneurship at either the county or the MSA areas.

³⁷ See (U.S. Bureau of Labor Statistics, 2023) for more information on the composition of the Labor Force.

³⁸ Although the field of “expat” entrepreneurship is starting to receive attention in the academic literature, see for instance (Vance, et al., 2017).

Employment and entrepreneurship at the MSA level are by definition centered around high population density areas of 50,000 inhabitants or more (OMB, Office of Information and Regulatory Affairs, 2010), and they are urban by nature. There are 384 such MSAs in the United States according to the U.S. Census Bureau. However new business start-ups may very well happen in rural areas, and using counties as our geographical area of focus allows us to capture this rural entrepreneurship as well. In addition, the universe of U.S. counties is much larger (3,143 as of 2017) and the depth and completeness of their historical data is deeper than that for MSAs, making counties the logical choice of geography for this study.

We will use as expansive a time frame for our analysis as the data will allow. Depending on each county, this might be from 1995 to 2019, and will not include data post Covid-19 pandemic in order to avoid the confounding outlier effect that those challenging times had on labor dynamics. Nevertheless, we will split our focus later in the study between pre and post-2006 entrepreneurship dynamics, for reasons that we will discuss in Section 3.5.

3.5 Data Description

3.5.1 Entrepreneurship Data

Although a common measure of entrepreneurship used in the economics literature is the number of proprietor self-employment in non-farm sectors, the definition of this category by the Bureau of Economic Analysis means that the correspondence between this measure and new entrepreneurial activity is not bijective. Proprietors are defined by the BEA as “active proprietors or partners who devote a majority of their working hours to their unincorporated businesses³⁹. Thus, if we try to measure new start-ups by looking at this statistic, we are ignoring the possibility that an enterprise could be started by several partners. Trying to circumvent this by assuming a constant proportion of partners to business ventures across counties would be inaccurate and increase unobserved heterogeneity in the sample. The BEA’s definition, if used as a measure of entrepreneurship, also ignores new start-ups that are incorporated from the get-go; it also ignores those that are started as a side project by an owner who has a different main source of income.

Bunten, Weiler et.al. (2015) explain it best when writing about their preference for the use of the number of new firms as a direct measure of entrepreneurship, in lieu of other metrics used in the literature:

“We include these measures for contiguity with other research and as a check of our hypotheses while noting potential drawbacks: proprietorship is a legal definition and the choice to operate as a corporation may reflect tax policies rather than intrinsic entrepreneurialism, while a business’s size may simply reflect a lack of desire or ability to expand.”

³⁹ <https://www.bea.gov/system/files/2019-12/Chapter-10.pdf>

In order to avoid these pitfalls, we use the US Census' Business Dynamics Statistics (BDS) number of business organizations as the dependent variable that measures entrepreneurship in our study. The BDS reports the number of both firms and establishments, alongside their age. We choose to focus on the former because we consider that –for instance- a new location for a restaurant franchise can be more accurately viewed as a business expansion rather than a new entrepreneurship occurrence. As the BDS conveniently provides tables for firm age by county, we can use the count of new firms (age=0) divided by a county's population to obtain per-capita entrepreneurship for a given county (Holmes T. a., 2002) per year. We use the numbers at the beginning of the fourth quarter in the year, and the sample covers from 1973 to 2019 (although many counties do not have data available for years before the mid-1990s).

There are vast differences in counties when it comes to population, and therefore we will use county population numbers to calculate a measure of new firms per 100,000 people. With this approach we are confident that it is new firm start-ups per person that we are explaining in our analysis, and not self-employment or business expansions. There is one small caveat to be aware of when using BDS data to measure entrepreneurship, and it is that it excludes enterprises in the public administration sector (NAICS 92). It will be important to keep this in mind when interpreting our results.

3.5.2 Firm Size

Percentage of county employment in large firms is our variable of interest, as we have already stated. We look at two possible sources for this data.

Business Dynamics Statistics:

We relied on the US Census' BDS to derive a measure of entrepreneurship; but firm size could be obtained from the BDS⁴⁰ as well, as it provides the number of firms and their size in number of employees for each county. The strength of this data set is that it directly measures the size of a firm by employees instead of using approximate figures (such as payroll), which would suit the purpose of this essay perfectly. However, BDS data tables by county only provide "coarse" measures of firm size (just three different categories) and therefore we are left to find another source to obtain this information.

U.S. Census Quarterly Workforce Indicators (QWI):

Fortunately, it is possible to obtain data on employment concentration by enterprise size also from the US Census' Quarterly Workforce Indicators (QWI, which distinguishes between very small enterprises, small enterprises, medium enterprises, large and very large enterprises (more than 500 employees). This latter category will be what we use in our analysis of the possible impact on entrepreneurship of employment concentration in large firm has.

3.5.3 Public Employment Data Sources:

US Census' Quarterly Workforce Indicators at the county level are available for either all ownership or just private ownership categories. In order to obtain public ownership employment, it is necessary to subtract one from the other. As we already stated, QWI does not differentiate

⁴⁰ <https://www.census.gov/data/tables/time-series/econ/susb/susb-historical.html>

between employment and the state, county or municipality level, and thus this metric will represent an aggregate of the three.

3.5.4 Demographic and Economic controls

US counties vary tremendously in population and geographic size. The interchange of ideas occurring in localities with large populations is known to promote entrepreneurship (D. B. Audretsch, 2008), this by itself can serve as an important control in our study (as well as its growth). But more importantly, a measure of county population is needed in order to calculate our entrepreneurship metric: the number of new firms per 100,000 people. With this in mind, we would like to focus our attention on the county population of working age (16 or older). Unfortunately, the US Census does not issue single year age population estimates for counties due to concerns about the reliability of this data. Luckily for us, the National Cancer Institute obtains this data from the Census and makes it available for researchers, noting caveats with their use (National Cancer Institute, 2020). This will be our source for demographic county data.

The entrepreneurship literature has established that growth in GDP fosters the creation of new business (Acs, Audretsch, & Lehmann, 2013), (D. Audretsch, 2007). GDP figures are not available at the county level, but we use measures of median household income (and its growth) and of the percentage of household in poverty as controls instead. These can be obtained at the county level from the Small Area Income and Poverty Estimates (SAIPE) from the United States Census⁴¹. Labor force and unemployment data are obtained from the US Census' Local Area

⁴¹ <https://www.census.gov/programs-surveys/saipe.html>

Unemployment Statistics. Our model will use 1-year lags of unemployment, income and poverty metrics in order to avert possible issues with reverse causality.

3.5.5 Controlling for purchasing parity and price differentials: a cross-country price index.

The use of price level benchmarks such as the Consumers' or the Producers' Price Indices would be ideal in order to control for the broad difference in the purchasing power of the dollar across the roughly 3,000 counties in the United States, for the time span covered by our study. Unfortunately, the Bureau of Labor and Statistics does not calculate such indices but at the regional level, and state (much less county) figures are not available. Some other sort of price adjustment is needed if we are going to compare dollar denominated characteristics through time and space.

Absent a more comprehensive index of prices for our sample, we must resort to a proxy if we want to be able to make meaningful comparisons. It is well known that housing tends to be the biggest discretionary outlay in the finances of a household, and that the share of housing expenses in the consumer's basket of goods remains relatively constant through time (notwithstanding business cycle variations). Owner-Equivalent Rent (OER), which is a measure of the cost of housing that includes the opportunity cost to owners of residing in their dwelling,⁴² has historically accounted for roughly 31% of the core CPI (Cecchetti, 2007). Indeed, CPI inflation and the US home price index move in close step, as Figure 3-4 below shows:

⁴² See Diewert (2003)

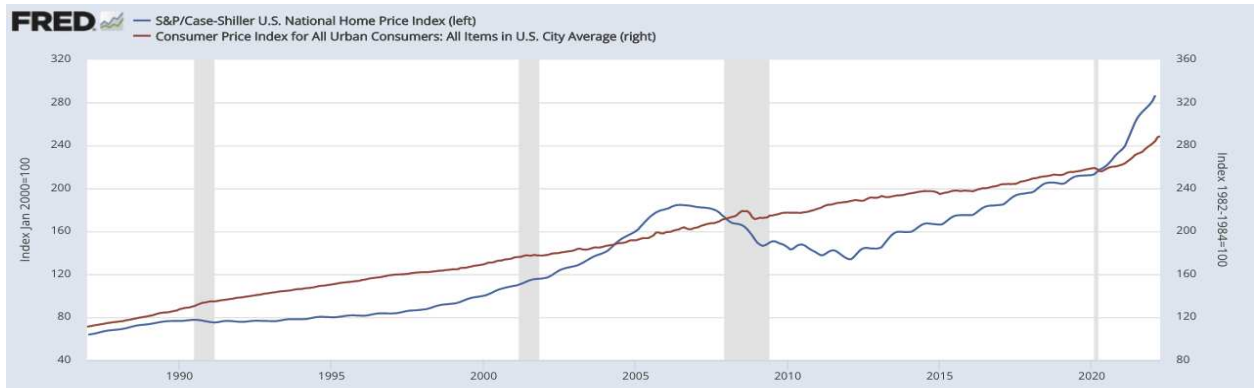


Figure 3-4: CPI v. HPI, 1985-2021 (S&P Dow Jones Indices LLC, 2023)⁴³.
Copyright, 2016, Standard & Poor's Financial Services LLC.

The use of housing prices can thus provide us with a proxy for price variability in our sample, and the Federal Housing Finance Agency (FHFA) makes such a metric available: the Housing Price Index (HPI). The HPI is a price level for residential dwellings that is available at the county level for the United States going back to the mid-1980s. The one caveat with using HPI values as a cross-county price benchmark is that the HPI is calculated separately for each individual county, thus reflecting price variability for a given county through the years (with a pre-determined year being the base for the calculation) and not across counties. Each county i will have a different price index that varies by year t : HPI_i^t .

To construct a meaningful price comparison across counties we need a figure for the value of a typical dwelling for each county in the US for a given year, to which we can calibrate that year's HPI. Zillow's Home Value Index (ZHVI) provides such a measure as it not only looks at the values of homes that are sold, but is indeed designed to reflect the value of the typical dwelling. We proceed by choosing a year in the ZHVI that is also in the HPI and which contains information for the most counties, as this ensures that we can construct an index for as large a set

⁴³ (FRED, n.d.) <https://fred.stlouisfed.org/series/CSUSHPINSA>

of counties as possible. All else equal a more recent year is preferred because of data reliability, and because our county data set for this essay is more complete for more recent vintages. We settle on 2022 as the most recent year for which the ZHVI is most complete, and for that year we make the numeraire be the US Average home price. Incidentally this happens to be \$315,411 in 2022 dollars, which also happens to be the typical home value in Fremont, CO, and which we will denote as PUS2022. Next for every county i we build an index for the year 2022 as $PZHVI_i^{2022} = 100 \times P_i^{2022} / PUS2022$. In 2022 for instance, Sacramento CA which has a typical home value of \$513,962, has a PZHVI of 162.95 (calculated as $100 \times 513,962 / 315,411$).

With $PZHVI_i^{2022}$ built for every county, we put together a local price index LPI for every county i and year t in the following manner:

$$LPI_i^t = (HPI_i^t / HPI_i^{2022}) \times PZHVI_i^{2022}$$

This allows us to proxy for price variations in the cost of living which are comparable not only across time, but across counties as well. Once again, it is important to note the caveat: the above graph from the Saint Louis Fed makes it evident that although housing prices trend closely with the CPI, they are more volatile and prone to “bubbles”. Bubbles in real estate and their burst happen at the national level, whereas local price variability in housing prices are due to local economic and demographic factors that can be factored in with appropriate county controls for population and income growth, local tax regulation etc. (Osttensmann, Payton, & Man, 2008). Therefore, although our local price index proxy could be distorted for the years for which a bubble or burst in real estate occurred, and as these temporary bubbles happen across the whole geographic market, we can still have confidence in the ability of our proxy to capture purchasing price differentials across counties for each year. The separate inclusion of annual “dummies” as

explanatory variables will allow us to ascertain whether or not periods of real estate (national) price booms and busts play a significant role in the determination of our regressand.

3.5.6 Tax and Policy Environment

Taxes on wages have the potential to impact entrepreneurship in different ways: on the one hand, if these taxes are onerous compared to those on interest or capital gains, high wage taxes might encourage employees to try to strike out on their own and become self-employed. We would expect the impact of wage taxes on entrepreneurship to be positive if this were the case. On the other hand, if new start-ups are undertaken part-time by people who are financing them with earnings from their full-time jobs, we would expect high wage taxes to discourage entrepreneurship. Recall that this possibility is one of the reasons why we chose the number of new firms to be our metric instead of non-farm self-employment.

We could follow a similar logic when trying to ascertain what the impact of capital gain taxes on entrepreneurship might be: a higher fiscal burden on this earnings class might discourage investment in financial instruments favoring instead the financing of a new business, especially when this new enterprise starts small and no return is expected except for maybe a modest opportunity cost compensation to the owner for their time and effort. On the other hand, should a start-up provide sizeable returns from the get-go, high taxes on capital gains would discourage new business formation. We consider this later scenario to be unlikely.

In any case, controls for county and state taxes on wages and capital gains could help explain some of the variability in new firm formation. For every county and year, we utilize measures of the total aggregated Federal and state maximum taxes on long-term capital gains and on wages. The National Bureau of Economic Research's TAXISM model is our source for this data.

Interest rates affect the financing costs and the opportunity costs (thus the comparative profitability) of any economic activity. The Federal Reserve Bank of Saint Louis' Economic Research Division provides historic metrics for the Federal Fund Rate and the Discount Rate that we use as controls in our analysis.

3.5.7 Employment in Mining and Manufacturing

Section 3.6.2 (page 118) will discuss the implementation of an instrumental variable approach in our estimation procedure which relies on the percentage of employment in the mining and the manufacturing sectors. In order to derive this metric, we once again rely on data for the Quarterly Workforce Indicators, this time focusing only on NAICS 21 and 31-33.

3.5.8 Personal Bankruptcy Exemptions

Previous work on entrepreneurship has shown that the generosity of the personal bankruptcy regime in a state can impact new firm start-ups (Correas, *The Role of Personal Bankruptcy Protections on Entrepreneurship: Cushion v. Forgiveness*, 2022). Federal bankruptcy statutes codify these; however, states can side-step them if they establish their own. Some states even offer bankruptcy filers the option of choosing the state's exemptions or the federal ones. As both federal and state exemptions are available for different property classes, we choose the maximum wildcard exemption (an exemption that can be used on any asset class) available from federal or state statutes as our proxy to represent the generosity of the personal bankruptcy regime in a given county. This figure is obtained from the Federal statutes as well as the state statutes for every locality for the pertaining year. As the wildcard exemption is a dollar denominated figure, we weigh it by the county's median household income to obtain a figure that gives an idea of the

forgiveness of the personal bankruptcy regime relative to the typical income of a household in the area.

These bankruptcy exemptions are exogenously pre-determined by the legislature and past attitudes towards bankruptcy as shown by Hynes et. al. (2004), and thus can safely be included as controls.

3.5.9 Patterns in the Geographical Distribution of the Data

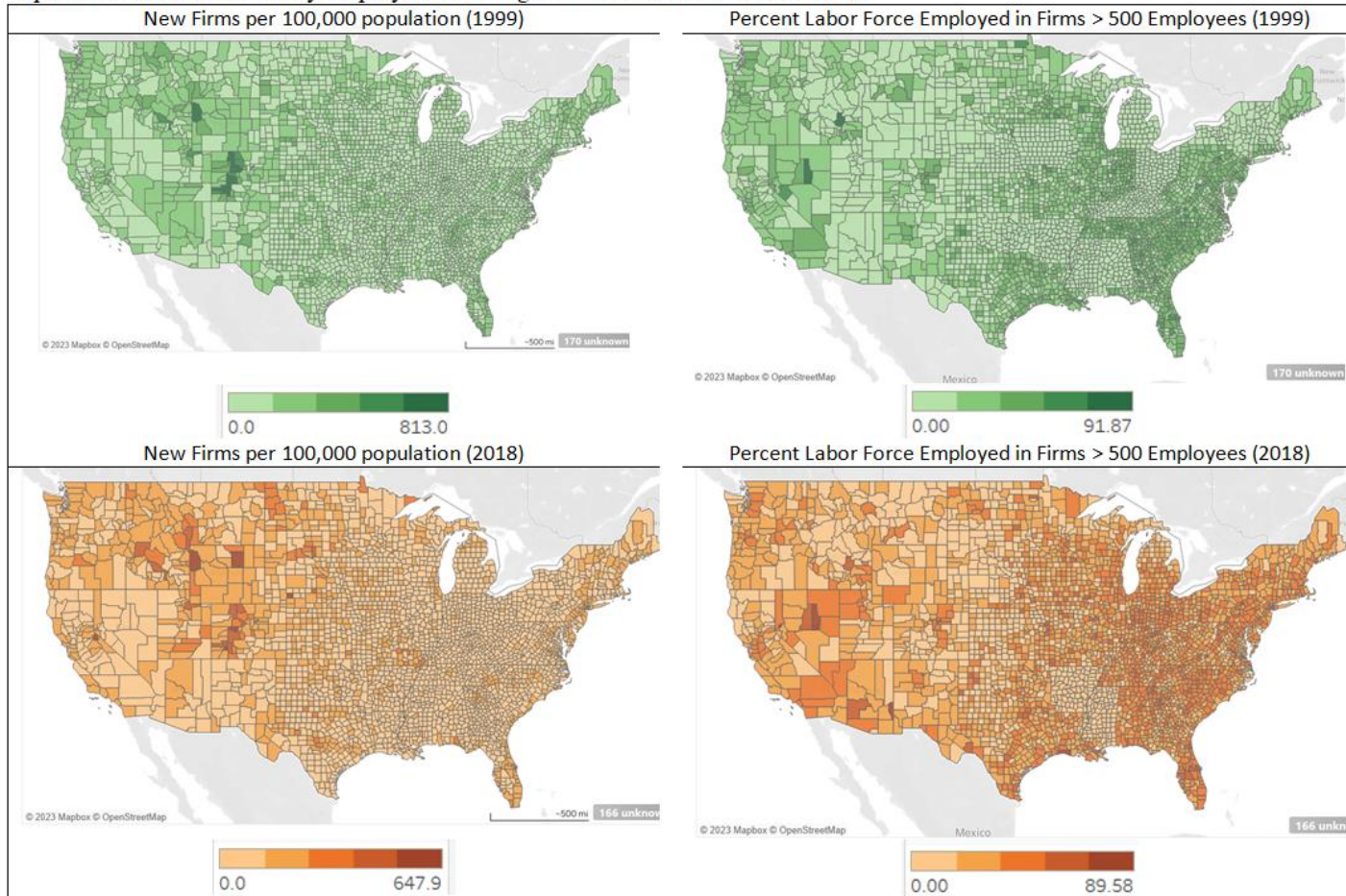
To get an idea of the geographical patterns of the data across the United States, we graph the distribution of county new firm creation and percentage employment in firms with 500 or more employees for the years 1999 and 2018. We choose these two years because during both of them, the United States economy was at the end of an economic expansion. Furthermore, GDP per capita has been shown to influence entrepreneurship (as we have mentioned before), and both years had a similar percentage of households living below the poverty level (11.9% in 1999 and 11.8% in 2018). The maps show distributional patterns for our two variables of focus divided equally into five quintiles that range from zero to the maximum value of the metric for the given year. The first observation worth mentioning is the fact that whereas in 1999 the county that was most prolific in the creation of new firms had 813 start-ups per 100,000 people (San Miguel County, CO), in 2018 this was down to 648 (Johnson County, Wyoming), a difference of 20%. This reinforces the idea of a historic decrease in entrepreneurship that we alluded to in the introduction to this paper.

Figure 3-5 below illustrates the spatial distribution of county employment in large firms and new firm creation for two selected years, 1999 and 2018. Looking at the two panels on the right, we see that in 2018 a greater portion of the US geography is dominated by employers with more

than 500 employees. In other words, there has been an increase across the country in the percentage of the labor force working for large companies. This is more apparent for counties in the East coast, the South and the mid-West. On the other hand, counties in the northern Rocky Mountains region and in the West where employment is less dominated by large companies seem to have a higher concentration of new start-ups per 100,000 people. Employment in the East, South and mid-West seems to have been overtaken by large firms, whereas the North-West and Rocky Mountain regions with fewer large employers seem to have become the spawning grounds for entrepreneurship.

Descriptive statistics and correlation matrices for the variables in our study are provided in Table 3-1 and Table 3-2.

Spatial Distribution of County Employment in Large Firms and of New Firm Creation



Source: US Census' Business Dynamic Statistics and Quarterly Workforce Indicators

Figure 3-5: Spatial Distribution of County Employment in Large Firms and of New Firm Creation

Table 3-1: Description, sources and summary statistics of variables

Variable	Description	Mean	SD	Min	Max	N	Source
New firms per population	Number of new firms created per 100,000 people in the state.	154.85	85.61	0	2322.93	130752	Business Dynamics Statistics
% Employment in Public Sector	Percentage of the civilian labor force working at state or local government jobs	21.18	10.14	0	97.72	79113	U.S. Census Quarterly Workforce Indicators
% Employment in Large firms (>500 employees)	Percentage of county's labor force working in firms with >500 employees nationally	28.84	14.37	0	91.87	77149	U.S. Census Quarterly Workforce Indicators
% Employment in small firms (1 to 19 employees)	Percentage of county's labor force working in firms which have from 1 to 19 workers	23.71	8.86	0	97.22	78907	U.S. Census Quarterly Workforce Indicators
% County's employment in Mining sector	Percentage of county's labor force working in the mining sector.	3.09	6.52	0	95.46	37980	U.S. Census Quarterly Workforce Indicators
% County's employment in Manufacturing sector	Percentage of county's labor force working in the manufacturing sector.	14.53	11.02	0	178.23	73591	U.S. Census Quarterly Workforce Indicators
Median Household income (in \$10K) inflation adjusted	County's median household income adjusted with HPI deflator	121.35	42.75	17.75	513.28	71642	US Census SAIPE
Percent of population living below poverty level	Percent of population living below poverty level	15.20	6.29	0	65.1	89424	US Census SAIPE
Unemployment rate	County's unemployment rate	6.17	3.20	0.4	40.6	106094	FRED Saint Louis Fed Reserve
County's population	County's population	8.52	28.58	0.01	1009.49	162334	National Cancer Institute SEER Program
Population growth	County's population growth	0.66	2.08	-65.47	42.56	159169	National Cancer Institute SEER Program
Fed Discount interest rate	% Federal discount rate	4.58	2.87	0.25	13	203558	FRED Saint Louis Fed Reserve
Max State Tax on Wages	Maximum marginal state income tax on earnings from wages	4.81	3.03	0	19.8	148012	NBER TAXISM model
Max State Tax on Capital Gains	State's maximum marginal capital gains tax.	4.20	2.89	0	14.1	148012	NBER TAXISM model
Wildcard Exemption (\$10K)	Wildcard bankruptcy exemption in \$10,000, adjusted by HPI index	19.76	25.81	0	245.40	76468	State and Federal statutes

Table 3-2 Matrix of correlations:

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) New firms per population	1														
(2) % Employment in Public Sector	-0.1480*	1													
(3) % Employment in Large firms (>500 employees)	-0.1602*	-0.6222*	1												
(4) % Employment in small firms (1 to 19 employees)	0.4052*	0.2260*	-0.7327*	1											
(5) % County's employment in Mining sector	0.0346*	0.1206*	-0.1187*	0.0822*	1										
(6) % County's employment in Manufacturing sector	-0.2146*	-0.3148*	0.3996*	-0.3306*	-0.2446*	1									
(7) Median Household income (in \$10K) inflation adjusted	-0.3405*	0.1287*	-0.0205*	-0.1376*	0.2437*	0.2061*	1								
(8) Percent of population living below poverty level	-0.3039*	0.3383*	-0.1063*	-0.1247*	0.1109*	-0.0530*	0.1371*	1							
(9) Unemployment rate	-0.2186*	0.0706*	-0.0085*	-0.0703*	-0.0203*	0.0172*	0.0014	0.4933*	1						
(10) County's population	0.0460*	-0.2032*	0.2494*	-0.1865*	-0.1389*	-0.0978*	-0.1971*	-0.0817*	-0.0052	1					
(11) Population growth	0.2670*	-0.1720*	0.1326*	-0.0354*	-0.0928*	-0.0362*	-0.3379*	-0.1890*	-0.0787*	0.0456*	1				
(12) Fed Discount interest rate	0.3000*	-0.0326*	-0.0339*	0.0773*	-0.0162*	0.1066*	-0.0181*	-0.0838*	-0.1398*	-0.0309*	0.0937*	1			
(13) Max State Tax on Wages	-0.0111*	-0.0669*	-0.0224*	0.0556*	-0.1958*	0.0330*	-0.1180*	-0.0882*	0.0256*	0.0517*	-0.0573*	-0.0201*	1		
(14) Max State Tax on Capital Gains	-0.0899*	-0.0612*	-0.0173*	0.0397*	-0.2000*	0.0271*	-0.0966*	-0.0966*	0.0218*	0.0700*	-0.0535*	-0.2579*	0.8672*	1	
(15) Wildcard Exemption (\$10K)	-0.1448*	0.0955*	-0.0399*	-0.0012	0.1970*	-0.0570*	0.1019*	0.2985*	0.0929*	-0.0472*	-0.0472*	-0.0233*	-0.4243*	-0.4487*	1

3.6 Econometric Specification and Method of Estimation

3.6.1 The econometric model

We build a panel data set for all the US counties, to test the impact of firm size on entrepreneurship. Thus, our dependent variable is: y_{it} = # new firms per 100,000 population. The raw data covers the years 1985-2022, although due to gaps in the data the earliest year utilized in most of our model estimations is 1995.

To control for omitted variable bias, we make use of a fixed effects approach:

$$y_{it} = \alpha_0 + \delta PctEmpPublic_{it} + \rho PctEmpLargeFirms_{it} + X_{it}\beta_1 + \theta_i + \nu T_t + \varepsilon_{it}$$
$$i \in \{1, 2, \dots\} \text{ all counties } t \in \{1995, \dots, 2019\}$$

The right-hand side elements of the equation include:

- $PctEmpPublic_{it}$ which is the % employment in the public sector for each county i and year t .
- $PctEmpLargeFirms_{it}$ which is the % employment in firms with more than 500 employees nation-wide, for each county i and year t .
- X_{it} is a matrix of county and time-varying control variables
- θ_i and T_t are county and year fixed effects.
- ε_{it} is a vector of characteristic errors.

3.6.2 Direction of causality and Instrumental Variable approach:

The presumed direction of causality in this essay from increase in concentration of employment in new firms to lesser entrepreneurship could easily be in the opposite direction: it could be the

decline in entrepreneurship that is the driver for an increase in the concentration of employment in large firms. This potential “reverse causality” would yield biased and inconsistent estimators. A solution is the use of an Instrumental Variable (IV) approach utilizing proxy variables for the concentration of employment in large firms that are not themselves correlated with entrepreneurship.

Using instruments based on labor force employment in mining and in manufacturing has proved to be a successful approach to proxy for large firm size and to aid in circumventing this endogeneity problem (Bunten, Weiler, Thompson, & Zahran, *Entrepreneurship, Information, and Growth*, 2015). Mining operations are typically large enterprises which have long term commitments and enduring fixed costs. In addition, mining operations provide their areas with substantial land rents (from easements and use arrangements) and support a host of ancillary businesses that must be of the size necessary to supply these giants at large. Start-ups rarely can afford the capital at the scale necessary to service these, and thus seldom benefit from their existence (Graves, Weiler, & Tynon, 2009). Lastly, mining and manufacturing are capital intensive industries in general, and for all these reasons, areas with an industrial history in these sectors tend to contain a higher number of large firms (by employment size) through agglomerative forces

With this in mind, we utilize the log of employment in mining and in manufacturing as non-linear instruments. In addition, we also use the 10-year lag of mining employment in the county as it is a span of time long enough to be exogenous to new firm growth in the county, bridging several up and down commodity price swings that are typically tied to the business cycle. Furthermore, the mere presence of incumbent mining economies, culture, and traditions by themselves may be more defining of the economic dynamics of an area than the percent of the

labor force currently employed in the sector, which is itself subject to boom-and-bust cycles. Our ten-year historical lag would also help capture this effect.

It is difficult to think of another reason for a connection between historical mining and manufacturing employment with entrepreneurship aside from their role in concentrating labor around large employers, in light of the characteristics of these sectors that we just reviewed and that are so widely supported in the literature. In any case, the Results section will discuss the outcome for statistical tests of this proposition.

3.7 Estimation results:

Table 3-4 (page 123) will show the estimates for the fixed effects regression in which the dependent variable is the number of new firms per 100,000 inhabitants, across all counties in the US and for the years between 1995 and 2020. The second through fifth columns include results obtained through the instrumental variable approach implemented as described above in order to control for reverse causality. We will first discuss the appropriateness and the success of this approach in Section 3.7.1 and Table 3-3 (page 121).

The second panel in Table 3-4 includes results where we have added the wildcard bankruptcy exemption as an additional control. My previous research has shown that the effect of this variable on entrepreneurship is different for the periods before and after passage of the 2006 Bankruptcy Abuse Prevention and Consumer Protection Act (BACPA), and therefore, the fourth and fifth columns in the table present results for these two periods.

3.7.1 Endogeneity Test and Validity of instruments:

Table 3-3: FE-IV: Endogeneity Tests and Validity of Instruments for EmplPct500Plus

	Without Bankruptcy All years (FE.IV)	All years (IV.B)	Models with Bankruptcy Exemption Variable Pre 2006 (IV.B.Pre)	Post 2006 (IV.B.Post)
Endogeneity test:				
Chi2, p-value	9.8, 0.001	17.2, 0.000	0.02, 0.89	15.5, 0.000
Underid: Chi2, p-val	40.56, .0000	29.60, .0000	12.338, .0150	18.89, .0008
Weak id: F, p-val	12.69, .0000	10.00, .0000	5.35, 0.0003	6.21, 0.0001
Overident. all instr.	5.316, .1500	3.7380, .2912	6.326, 0.0968	1.590, 0.6617
N	16052	12860	975	11626
Obs per group:				
min avg max	2 11 21	2 10 19	2 4 6	2 9 13
Groups:	1386	1345	263	1333

* Underid: Kleibergen-Paap rank LM Weak id: Kleibergen-Paap Wald rank. Overident: Sargan Hansen J stat

An endogeneity test for a model can be run by looking at the difference between a Sargan-Hansen statistic obtained from the model run with a restricted set of instruments (which treats our regressor of interest as exogenous), and another one obtained from it run with the full instrument set. The null hypothesis is then that the suspect regressor is exogenous. As we can see in Table 3-3, statistical endogeneity tests strongly reject the exogeneity null hypothesis for the EmplPct500Plus variable, except for the model run with the bankruptcy exemptions variable for the pre-2006 period. Then again, that model was only run with 975 observations, which most likely handicaps the statistical power of the test. The results for the other three models (FE.IV, IV.B and IV.B.Post), which are run with over 11,000 observations, yield Chi-square statistics of 9.8 or above (with p-values 0.0001 or smaller) which confirms our suspicion of an endogenous source for the regressor representing the percentage of labor force employment in firms with more than 500 employees. The lack of statistical power in rejecting the model run on pre-2006 data will lead us to ignore its estimates in the discussion which follows, although its results are presented in the tables for comparison.

As we move on to evaluate the appropriateness of our chosen instruments, we focus our attention on the results for the Sargan-Hansen J test of over-identification. The test checks the orthogonality of the instruments to the errors of the model, with the null hypothesis being that the instruments are independently distributed from the residuals. We are not able to reject this assumption, with resulting J statistics that give us p-values of 0.15, 0.29 and 0.66 for the FE.IV, IV.B and IV.B.Post models respectively, which gives us confidence in the validity of our instruments.

Under-identification tests are Lagrange Multiplier tests for the correlation of the excluded instruments with the endogenous variable of concern. The null hypothesis (with a Chi-square distribution) is that the excluded instruments are uncorrelated with the endogenous regressor which is thus “under-identified”. Rejection of the null reassures us in the identification of the model, which is happily the case for our FE.IV, IV.B and IV.B.Post runs. These three models all have p-values below 0.001.

Lastly, it can be the case that although the excluded instruments are correlated with the suspect regressor (as we just verified that they are), this correlation is poor. When this is the case, the estimators may lack robustness and perform unreliably. The Kleibergen-Paap test is a Wald test for “weak identification” when residuals are not assumed to be i.i.d. and the model is run utilizing cluster robust estimation techniques. The null hypothesis of a “weakly identified” equation is distributed as an F statistic, which in our three model runs of focus has p-values of less than 0.0001. We can therefore reject the null of weak identification for our FE.IV, IV.B and IV.B.Post models.

In conclusion, tests results for endogeneity and identification validate the use of an instrumental variable approach and our choice of instruments. IV estimation results are presented in Table 3-4, and first stage results for the instruments are in Table II-1 in Appendix II.

Table 3-4: FE: 2nd stage regression results

	DV: # New Firms per 100,000 population				
	Employment Concentration: % in large firms		Employment Concentration: % in large firms. Wildcard Bankrupt. Exemption		
	FE All yrs	FE-IV All yrs	FE-IV All yrs	FE-IV pre-2006	FE-IV post-2006
	(FE)	(FE.IV)	(IV.B)	(IV.B.Pre)	(IV.B.Post)
% Employment in Public Sector	-0.8987*** (0.0583)	-4.5529*** (0.9148)	-5.5163*** (1.0644)	-1.8614 (2.9139)	-5.9438*** (1.3338)
% Employment firms larger 500	-0.5014*** (0.0358)	-3.5290*** (1.0582)	-4.8356*** (1.3124)	-0.5520 (3.3673)	-5.2402*** (1.6423)
Median HH Income HPI adj (\$10K)	-0.1327*** (0.0143)	-0.0378 (0.0390)	-0.0296 (0.0479)	0.0368 (0.2676)	-0.0630 (0.0503)
% Population below poverty line.	-0.6823*** (0.0918)	-1.2613*** (0.1734)	-1.3419*** (0.2093)	-1.0381 (1.3678)	-1.2181*** (0.2202)
% Unemployment	-1.4992 *** (0.1238)	-1.3700 *** (0.3533)	-2.0135*** (0.415)	-8.2562*** (3.1346)	-1.7640 *** (0.4520)
County population (10K)	0.2411*** (0.0503)	0.4538*** (0.0535)	0.3889*** (0.0640)	0.5853 (0.4235)	0.2980*** (0.0888)
Population % growth	4.7253*** (0.1450)	5.9152*** (0.6725)	6.0887*** (0.7755)	4.4661 (3.1601)	6.0602*** (0.8575)
Fed Discount Rate	-7.1255*** (0.5160)	-1.3218 (2.4849)	-3.5577 (2.3203)	5.1249* (2.7787)	-3.8235* (2.3445)
Max State Tax on Wages	-0.7479* (0.4670)	-2.3601 (1.8743)	-4.4049** (1.9714)	-7.4361 (6.1265)	-4.4096** (1.9510)
Max State Tax on Long Gains	1.4591*** (0.4164)	3.7305* (1.9058)	4.8825** (2.0083)	2.0443 (4.3685)	4.0738** (1.9892)
Wildcard Exemption (\$10Ks) Adjusted			-0.1640*** (0.0450)	0.6134 (1.0917)	-0.151*** (0.0461)
Constant (not reported for IV)	262.1629*** (4.4459)				
Signif Fixed Eff.	1995-2020	2000-2008,2018	Except 10-11 14,15	Except 2003	Except 10-11 13-15
R ² – within:	0.3701				
R ² – overall:	0.3064	0.2578	0.2613	0.1571	0.2115
F stat, Prob>F	999.2, .000	149.6, .000	146.12, .000	5.35, .0003	105.97, .0000
# instrum, # excluded	N/A	32, 4	32, 4	32, 4	32, 4
Endogeneity test:					
Chi-sq, p-value	N/A	9.8, 0.001	17.2, 0.000	0.02, 0.89	15.5, 0.000
N	60601	16052	12860	975	11626
Obs per group:					
min avg max	1 22 26	2 12 21	2 10 19	2 4 6	2 9 13
Groups:	2743	1386	1345	263	1333

Note: 1st stage regression results in Appendix

3.7.2 Impact of the controls on the dependent variable.

As we could have surmised, population growth and the Federal discount rate turn out to be some of the strong determinants of entrepreneurship, and in the anticipated directions: population growth is associated with an increase in entrepreneurship whereas the federal discount rate is associated with a decrease. A one percent increase in the population growth rate is associated with a predicted average increase of 6 new firms per 100,000 people, whereas a 10,000 increase in population is associated with an increase of roughly 0.4 firms per 10,000. On the other hand, a one percent increase in the discount rate leads to a decrease in the expected number of new firms between 3.5 and 7.13. However, this last figure is for the un-instrumented estimation which we now know can lead to biased results.

Not surprisingly, the prevalent poverty rate in the county is negatively associated with entrepreneurship: the county's poverty percentage decreases the expected number of new firms at a 1 to 1 rate. Median household income then has a paradoxical effect, because it is also negatively associated with entrepreneurship. However, the coefficient for this variable is so small (-0.03 expected new firms per 100,000 people for every \$10,000 increase in income) that we do not put much stock on its magnitude. Like the poverty rate, the unemployment rate is negatively associated with entrepreneurship with every one percent increase in unemployment associated to an expected decrease of between 1.5 to 2 new firms per 100,000 people.

At this point, a word is warranted on the effects of the possible collinearity of the last three discussed regressors: median household income, population below the poverty line and the unemployment rate. The existence of a correlation between them is of course entirely likely, yet I argue that it is of no concern in our case. For once, collinearity does not cause bias and inconsistency in the parameter estimates, it only causes the reported estimated standard errors for

each covariate to be erroneously large. Collinearity problems are therefore insufficient data problems, as when the sample used is small statistical tests do not have the power to distinguish between the slight effects attributable to one variable or the other. When this problem exists, we will lack the power to reject the null hypothesis of non-zero parameter estimates. If however, the data sample is large enough that it brings the probability of a type II error down to an acceptable level for our regressor, its possible collinearity with other regressor variables is no longer an issue. On the other hand, multi-collinear variables employed as controls are used in our model only to absorb their “disturbance” which would otherwise be incorporated into the residuals for the regression. The coefficient of the multi-collinear variables is of no importance as long as they are not our variables of interest, because they do not bias our results (Goldberger, 1991). We thus do not concern ourselves with possible multi-collinearity between these three variables, as they turn out to be statistically significant nevertheless.

The maximum tax on wages is statistically significant, with a coefficient that indicates that every 1 percent increase in its rate is associated with an expected decrease of between 2.3 to 4.4 new firms per 100,000 people. This gives credence to the idea that perhaps many new start-up efforts are financed from wage earnings. On the other hand, a one percent increase of the maximum long-term gains tax is associated with an expected increase of between 3.7 to 4.9 new firms per 100,000 souls. As we postulated in Section 5.6 it could be that taxation of financial gains could incentivize potential investors to reallocate put their funds into their own business venture. Again, suspicion may arise regarding possible collinearity between the wage and the long-term gains tax variables. However, following the same line of thought of the previous paragraph and since both tax variables are included only as controls to absorb their disturbance, and given that their parameter values are still significant, their possible collinearity does not

trouble as. Yet, to assuage any concerns, models were run with each of the tax variables by themselves. Only models with the long-gains tax variable are significant in this case (with the same sign as when both variables are included together in the model), and the magnitude, sign, and significance of the other regressors (most importantly that of our two variables of interest) are almost identical to those in the models where both tax variables are included.

Our final control is the wildcard bankruptcy exemption (as a percentage of household income) because, as I have already mentioned, some research point to a negative association between generous personal bankruptcy protections and entrepreneurship. Since this association seems to have been affected by the 2006 passage of the BAPCPA law, our third column in Table 3 (IV.B) runs the model for the complete time span that is available in our data (1995 to 2021) but the fourth and fifth column (IV.B.Pre and IV.B.Post) do it for the pre and post 2006 periods respectively. We have already touched on how the IV.B.Pre model may not utilize enough data to wring out statistical significance out of the parameter estimates, but the models run on the whole data set and on the post-2006 periods find a strong and negative statistic association: every \$10,000 increase in the generosity of the wildcard bankruptcy exemption is leads to an expected decrease of roughly 0.15 to 0.15 new firms per 100,000 population. Although the magnitude of this effect is small, the models with the bankruptcy variable do slightly improve the fit of the model (adjusted R square going from 25% to 26% for the whole data set). Furthermore, rural counties are typically more likely to be absent from the pre-2006 data sample, as they are slower to digitize than their larger urban counterparts. As such, this results in a conservative estimate of this effect, because many of the mining and manufacture intensive counties (which are used as proxies counties where large employers dominate) are likely to be rural.

The Federal discount rate predictable has a negative impact on entrepreneurship, with every 1% increase being associated with an expected decrease of between 1.3 to almost 4 new firms per 100,000 population.

Before we move on to analyze the result of our variables of interest, we finish our discussion on estimation controls by briefly commenting on the fit of the model. Without implementation of the IV approach, the fit of the model is pretty satisfactory with adjusted R squares in the order of 37%, and even getting in the 40% range for slightly different specifications. However, we have already underscored the fact that endogeneity of the variable controlling for employment in large firms is shown to be an issue that must be dealt with in this estimation. Upon implementing an IV approach in order to control for this, the fit of the model is decreased by more than 10% with R squares of 25 or 26%. It is important to note that the full model without IV controls can utilize 60,601 observations, whereas for the IV approach we are down to 16,000 if no bankruptcy variables are used, and 12,000 when they are.

3.7.3 Effects on entrepreneurship of the county's employment concentration.

The purpose of this essay is to investigate what effect (if any), the concentration of employment in large firms may have on new firm start-ups. As the nature of public employment differs from that of the public sector, we analyze the impact of employment at the state and local level on entrepreneurship as well.

3.7.3.1 Concentration of employment in the public sector.

As we discussed in section 3.4.2, the nature of employment in the private and public sectors is different. One of our variables of interest is therefore the percentage of the labor force that is employed at the state, and local levels.

Across all specifications, public employment is negatively associated with entrepreneurship in the county: on average a 1% increase in public employment is linked to an expected decrease ranging between 4.6 to 5.2 fewer new firms per 100,000 people. It could be beneficial to study whether this dynamic is different for large versus small population counties, and an interaction term between the two variables might help disassociate this. As the administration of a county entails incurring some fixed costs for the provision of basic necessities (law enforcement, courts, schools and basic administrative offices), it could well be that these costs hoard more of the labor force available in sparsely populated counties, thus making it difficult for new firms to find workers. An interaction term might yield some insight into this possibility. If on the other hand public employment is viewed across the board as being more desirable than private sector employment (due to job security, benefits or other factors), the effect would be apparent in counties of any size. This might be a fertile new avenue of study to later pursue.

3.7.3.2 The effect of the proportion of the labor forced employed in nationally large versus small enterprises.

To study the effect that the concentration of labor in large firms could have on new business startups, our models include a variable (EmplPct500Plus) that measures the percentage of the labor force in each county that is employed in firms that have more than 500 employees nationally. The results of our estimation are consistently significant and unequivocal: every 1% increase in the percentage of the labor force that is employed in large firm leads to an average decrease in the expected number of new startups of between 4.5 to 6 firms per 100,000 people. This effect is greater than that of employment concentration in the public sector, and like it, is robust across all specifications.

3.8 Robustness to alternative measures of entrepreneurship:

Although you may recall per our discussion in 3.5.1 that we used the number of new firms per 100,000 inhabitants as our measure of entrepreneurship, other metrics have been used in the literature to do this: most common are the number of non-employer proprietors in the non-farm sector, and the number of unincorporated businesses. We already discussed the pitfalls of these in Section 3.5.1, as they are proxies for entrepreneurship rather than its direct indicators.

However it is useful to run our analysis using these metrics to check if our results are robust to alternative measures of entrepreneurship, and thus Table 3-5 includes Instrumental Variable estimation of our model (without the bankruptcy variables) using the number of new non-employer establishments and the number of new unincorporated business per 100,000 people as dependent variables. For reference, the first column displays the estimation using our dependent variable of choice, new firms per 100,000 inhabitants.

Table 3-5: FE: IV 2nd stage results, alternative measures of entrepreneurship

	Employment Concentration: % in large firms		
	DV: New firms per 100,000 population (benchmark)	DV: Non-employers per 100,000 population	DV: Unincorporated businesses per 100,000 population
% Employment in Public Sector	-4.5529*** (0.9148)	5.6818 (6.1063)	-43.4142 (27.7190) p-value: 0.11
% Employment firms larger 500	-3.5290*** (1.0582)	7.9449 (7.2635)	-46.5368 (30.5637) p-value: 0.12
Median HH Income HPI adj (\$10K)	-0.0378 (0.0390)	-1.2377*** (0.2681)	-1.3405*** (0.4851)
% Population below poverty line.	-1.2613*** (0.1734)	-0.5459 (1.2934)	-4.6580** (2.1870)
% Unemployment	-1.3700 *** (0.3533)	-8.0563 *** (2.1345)	-14.2185*** (4.5271)
County population (10K)	0.4538*** (0.0535)	3.1065*** (0.6915)	7.0861*** (1.7423)
Population % growth	5.9152*** (0.6725)	23.8106*** (4.0640)	22.3020*** (6.4445)
Fed Discount Rate	-1.3218 (2.4849)	1.2224 (8.6358)	-490.0677*** (26.3023)
Max State Tax on Wages	-2.3601 (1.8743)	-9.2502 (7.2434)	15.8083 (25.1560)
Max State Tax on Long Gains	3.7305* (1.9058)	9.8790 (6.8775)	9.0365 (21.7748)

Significant Fixed Eff.	2000-2008, 2018	All but 2000, 2001, 2006, 2010, 2011	All
R ² :	0.2578	0.1975	0.3133
F stat, Prob>F	149.6, .000	128.50, .000	310.17, .000
# instrum, # excluded	32, 4	31, 4	19, 4
Endogeneity test (H0: not endog.)			
Chi-sq, p-value	9.8, 0.001	2.05, 0.153 Cannot reject	4.13, 0.042**
N	16052	14975	8950
Obs per group:			
min avg max	2 12 21	2 10.9 20	2 7 8
Groups:	1386	1375	1287

The model with non-employers as the dependent variable does not achieve much explanatory power, as few parameter estimates turn out to be statistically significant and its R² is lower than that obtained for the benchmark estimation. But encouragingly, the parameter estimates that turn out to be significant (median household income, unemployment rate, county population and its growth) are also significant in the reference estimation, and with the same sign. A similar result occurs in the estimation using unincorporated business as a dependent variable, except that here the tax variables are not significant but the variable controlling for median household income is (which was not the case in our reference estimation). Our variables of interest, which are the percentage of county employment in the public sector and in firms with more than 500 employees, narrowly miss the 10% significance level (with p-values of 0.11 and 0.12 respectively) but their parameter signs follow the pattern of the benchmark model: higher concentration of employment with these characteristics is negatively associated with the dependent variable proxying for entrepreneurship. The parameter estimate is indeed one order of magnitude larger, although confidence intervals are very large due to the large p-values for these estimators. It is likely that more data would help to tighten the significance of the parameter estimates for our variables of interest in these specifications.

We conclude that our model specification is robust to alternative proxies for entrepreneurship, as when using these, the parameter estimates are not in disagreement with those obtained when

using our variable of choice (number of new firms per 100,000 inhabitants). As we have already discussed these alternative measures of entrepreneurship are proxies that may include data that does not reflect new entrepreneurial activity, and may also miss some actual start-ups, and as such we would not expect to find as strong a statistical association as when using our entrepreneurship measure of choice.

3.9 Conclusion

The Chinitz's hypothesis proposes that the phenomenon of agglomeration is the core driver of local economies, and a prevalent interpretation of this idea is that firm size (as opposed to lack of industry diversity) is the catalyst for this dynamic. In this regard, firm size measured by their share in each particular local industry is considered to be one of the most important metrics for agglomeration.

This paper has looked at the concentration of the workforce in large employer firms and in the public sector, and its possible local effects on new firm start-ups. No distinction was made between industries, and employment in large firms was considered as its whole share in the total local workforce.

Concentration of employment in the public sector is found to be negatively associated with new firm start-ups in a county: on average a 1% increase in public employment is linked to an expected drop between 4.6 to 5.2 fewer new firms per 100,000 population. Furthermore, the concentration of employment in large private firms has a similar effect: a 1% rise in the share of the workforce employed in large firms is associated with an average 4.6 to 5.2 drop in new firms per 100,000 people. We conclude our analysis by highlighting the fact that it serves as a confirmation of the Chinitz hypothesis, but applied to both the public and the private sectors: the

concentration of employment in large organizations, regardless of which sector they are in, is an important driver for localization economies as it pertains to entrepreneurship and is in fact a detriment to new firm creation.

3.10 Issues for consideration and challenges:

Some indices have been created to measure firm concentration, as in Rinz (2018) and in Benmelech, Bergman and Kim (2018). It might be interesting to perform our analysis using one of these, although they do not take into consideration public employment. It might also be desirable to include other controls to absorb more of the nuisance in the model: our attempt to use an index or county amenity score was not successful because of a lack of variability across nearby counties and through time (as much of this is dependent on geography and weather). A control for the percentage of the labor force employed in creative enterprises and the arts might be useful as well, but again issues of endogeneity would have to be resolved for this to be successful potentially reducing the sample of data available for estimation and the statistical power of our tests.

One final point to make is that our observation on the negative effects that public employment has on entrepreneurship opens the door to subsequent inquiries aimed at discovering why this is so. Higher job security and more generous benefit packages such as pensions, may serve as an incentive for public employees to stay with their jobs and not branch out into their own business.

CONCLUSION

In this dissertation, the theme has been the study of two institutional and structural factors that can impact the creation of new enterprises: the framework of the bankruptcy law, and the concentration of employment in large firms. Since the personal bankruptcy statute also has the potential to impact the lives of private individuals beyond their business and professional prospects, we devoted another chapter to explore its humanitarian aspect and looked at how asset protections from repossession can reduce the incidence of homelessness. Entrepreneurship is a recognized factor for economic growth and development, and its downwards trend in the U.S. since the late 1980s has been the subject of much concern among regional economists. Likewise, the subject of homelessness is one that is becoming more prescient in the U.S. amidst a housing affordability crisis, and the recent increase in the unsheltered homeless population⁴⁴ (especially in the downtowns of some of the largest and wealthiest American cities) has become a topic of notoriety in the news and of much political feud. The literature has long recognized that entrepreneurship can be both a cause or a remedy for inequality (Bruton, Sutter, & Lenz, 2021), and thus the work that we present is important because in addition to analyzing whether certain policies aimed at fostering entrepreneurship are effective in doing so, it illustrates some of their social effects.

Chapter 1 focuses on personal bankruptcy law in the U.S., and its impact on firm creation. As stated in the literature, personal bankruptcy protections act as insurance against failure for the business creator, and one of the stated purposes of the Bankruptcy Act is precisely to encourage

⁴⁴ Refer back to Figure 2-4, pg 74

entrepreneurship through the amelioration of risk. Two different aspects of the bankruptcy law are studied: the “fresh-start” provision which wipes out all debts of the applicant, and the asset exemptions which prevent certain personal possession from being taken away when the assets of the applicant are liquidated to satisfy creditors’ claims before debt discharge.

Of the two features of the personal bankruptcy law, we find that debt relief is linked to an increase in entrepreneurship whereas asset protections seem to hinder it. This is because the passage of the 2005 BAPCPA which made the discharge of debt more difficult is statistically associated to a decrease in firm start-ups, and the same is true for increases in the inflation adjusted asset protection legislated amounts. Paradoxically, periodic increases in the exemption amounts do act as temporary stimuli for entrepreneurship, which is short-lived and dissipates in one or two years. The conclusion is that if the goal is to encourage entrepreneurship, a change in policy facilitating the discharge of debt is advantageous, whereas expanding property protections hinder it.

But the Bankruptcy Act and the long tradition of debt forgiveness in the United States not only establish the encouragement of economic activity as their reason for being, but also advance a humanitarian purpose for their design. Chapter two therefore looks at the bankruptcy protections that shelter filers from the dispossession of their homes, to determine if they aid in reducing homelessness. Curiously this turns out not to be the case, and increases in the home exemption are associated with increases in the rate of homelessness of a state. Nonetheless, increases in the wildcard exemption, which are by comparison much smaller in size but cover any property of the applicant, are statistically associated with strong drops in the rate of homelessness. The policy implication is that in as far as protection from destitution is concerned, not all asset protections in the bankruptcy law are effective: modest exemptions applicable to any property and that

presumably the filer can apply to assets that preserve their ability to earn a livelihood are likely effective in reducing homelessness in a state; but exemptions that allow people to keep their homes do the opposite.

In the last chapter of this work, we turn our focus back on entrepreneurship in order to study whether the concentration of employment in large firms could have a local monopsony effect that influences the rate of new firm creation. By looking at the impact that the dominance of large employers may have in an area, the chapter serves as a test of the Chinitz hypothesis of agglomeration in relation to local entrepreneurship dynamics. The new aspect in this analysis is that it considers the total concentration of employment in large organizations as a whole, with all industry sectors viewed together. In addition, since entrepreneurship is a private sector phenomenon, most studies on entrepreneurship only consider how factors in the private labor market may shape it; however, our study also looks at the influence that concentration of employment in the public sector could have on firm creation. We find that the more prevalent the dominance of big employers in the labor market, the fewer start-ups there are in a county. At the local level and all else being equal big employers displace firm creation, and this is the case whether the giants are in the public or the private sector and irrespective of industry.

In concluding, the results from this work suggest that new firm creation is aided by the facilitation of debt forgiveness in the event of possible bankruptcy, and that the concentration of the labor force in large employers and the provision for the sheltering of assets during bankruptcy are detrimental to entrepreneurship. However, other exemptions which although moderate in amount can be used to shelter any assets during bankruptcy, have a different benefit which is that they reduce the incidence of homelessness. As the bankruptcy exemptions are

regularly revised by the state legislatures, these insights can be particularly helpful in order to tailor policy to desirable economic and social outcomes.

This dissertation focused on very particular aspects of the bankruptcy law, of the local labor market, and on their entrepreneurship and humanitarian aspects. Its conclusions and the detailed dataset developed for it open a wide field of inquiry for these and other topics. An obvious follow-up would be to investigate the impact that other asset protections may have on particular industries, on different aspects of the local economy, and on the labor market. What kind of effect does the automobile bankruptcy protection have on the labor market, as it could potentially preserve a worker's ability to commute to work? Would this be different in an area with a robust public transportation network? And how about the tools of the trade protection, or exemptions for college savings and to health care accounts, do they have meaningful impacts on the lives and the economics of the people covered by them?

It is my humble hope that my modest contribution piques the curiosity in some reader to further explore some of these topics.

BIBLIOGRAPHY

- 11 USC Sec 105 to 1532 - Bankruptcy. (1978). *United States Code, 2012 Edition, Supplement 3, Title 11 - BANKRUPTCY*. Retrieved from <https://www.govinfo.gov/content/pkg/USCODE-2018-title11/pdf/USCODE-2018-title11.pdf>
- 15 U.S.C. Sec 522 - Bankruptcy: Creditors,the Debtor, and the Estate. (2018). Office of the Law Revision Counsel. Retrieved from <https://www.govinfo.gov/app/collection/uscode/2018/title11/chapter5/subchapterII/Sec.%20522>
- Abadie, A., Athey, S., Imbens, G. W., & Wooldridge, J. M. (2023). When should you adjust standard errors for clustering? *The Quarterly Journal of Economics*, 138(1), 1-35. doi:10.1093/qje/qjac038
- Acs, Z., Audretsch, D., & Lehmann, E. (2013). The knowledge spillover theory of entrepreneurship. *Small Business Economics*, 41 (4), 757-774.
- Aparicio, S., Urbano, D., & Audretsch, D. (2016). Institutional factors, opportunity entrepreneurship and economic growth: panel data evidence. *Technological Forecasting and Social Change*, 45-61. doi:10.1016/j.techfore.2015.04.006
- Armour, J. a. (2008). Bankruptcy Law and Entrepreneurship. *American Law and Economics Review*, 10(2), 303-350. Retrieved 10 04, 2020, from <https://www.jstor.org/stable/42705535>

- Audretsch, D. B. (2004, September 1). Entrepreneurship capital and economic performance. *Regional Studies*, 38, 949-959.
- Audretsch, D. B., & Feldman, M. (1996, February). R&D spillovers and the geography of innovation and production. *American Economic Review*, 86, pp. 630-640. Retrieved from https://www.researchgate.net/profile/Maryann-Feldman-2/publication/220019658_R-D_Spillovers_and_the_Geography_of_Innovation_and_Production/links/547642d60cf29afed6142030/R-D-Spillovers-and-the-Geography-of-Innovation-and-Production.pdf
- Audretsch, D. B., & Feldman, M. P. (1999, February 15). Innovation in cities: Science-based diversity, specialization and localized competition. *European Economic Review*, 43(2), 409-429. Retrieved from http://maryannfeldman.web.unc.edu/files/2011/11/Innovation-in-Cities_1999.pdf
- Audretsch, D., Heger, D., & Veith, T. (2015). Infrastructure and entrepreneurship. *Small Business Economics* 44, 219-230.
- Baptista, R., & Preto, M. (2011). New Firm Formation and Employment Growth: Regional and Business Dynamics. *Small Business Economics*, 36, 419-442. doi:10.1007/s11187-009-9254
- Barrett, L. &. (2004, March). The Geography of Homelessness in American Communities: Concentration or Dispersion? *City & Community*, 3-27. Retrieved from <https://journals.sagepub.com/doi/pdf/10.1111/j.1535-6841.2004.00064.x>
- Benmelech, E., Bergman, N., & Hyunseob, K. (2018). Strong employers and weak employees: How does employer concentration affect wages? *NBER Working Papers*(24307).

- Bennett, D. (2019). Infrastructure investments and entrepreneurial dynamism in the U.S. *Journal of Business Venturing* 34.
- Bertrand, M., Duflo, E., & Mullainathan, S. (2004, February). How much should we trust differences-in-differences estimates? *The Quarterly Journal of Economics*, 119(1), 249-275. doi:10.1162/003355304772839588
- Bielenberg, J., Futrell, M., Stover, B., & Hagopian, A. (2020, Jan-Dec). Presence of Any Medical Debt Associated With Two Additional Years of Homelessness in a Seattle Sample. *Inquiry*, 57. doi:10.1177/0046958020923535
- Bruning v. United States, 376 U.S. 358 (U.S. Supreme Court March 23, 1964). Retrieved 12 27, 2020, from <https://supreme.justia.com/cases/federal/us/376/358/#tab-opinion>
- Bruton, G., Sutter, C., & Lenz, A.-K. (2021, May). Economic inequality - Is entrepreneurship the cause or the solution? A review and research agenda for emerging economies. *Journal of Business Venturing*, 26(3). Retrieved from http://annakatharinalenz.com/wp-content/uploads/2021/02/Economic-Inequality-Is-Entrepreneurship-the-Cause-or-the-Solution_.pdf
- Bunten, D., Weiler, S., Thompson, E., & Zahran, S. (2014, October 07). Entrepreneurship, Information, and Growth. *Journal of Regional Science Volume 55, Issue 4*. Retrieved from <https://doi.org/10.1111/jors.12157>
- Bunten, D., Weiler, S., Thompson, E., & Zahran, S. (2015). Entrepreneurship, Information, and Growth. *Journal of Regional Science*, 55(4), 560-584. doi:10.1111/jors.12157

- Byrne, T. a. (2012, November 4). New Perspectives on Community-Level Determinants of Homelessness. *Journal of Urban Affaris*, 35(5), 607-625. Retrieved December 2020, from <https://onlinelibrary.wiley.com/doi/pdf/10.1111/j.1467-9906.2012.00643.x>
- Carlino, G. A. (1980). Contrasts in Agglomeration: New York and Pittsburgh Reconsidered. *Urban Studies*, 17, 343-351.
- Carree, M., van Stel, A., Thurik, R., & Wennekers, S. (2007). The relationship between economic developmet ad business ownership revisited. *Entrepreneurship & Regional Development*, 19, 281-291. doi:10.1080/08985620701296318
- Cecchetti, S. (2007, June 13). *Housing in inflation measurement*. Retrieved September 3, 2022, from Monetary Policy, VOXEU Column: <https://cepr.org/voxeu/columns/housing-inflation-measurement>
- Chinitz, B. (1961). Contrasts in Agglomeration: Ney York and Pittsburg. *American Economic Review; Papers and Proceedings*, 279-289. Retrieved March 03, 2021, from <https://www.jstor.org/stable/1914493>
- Ciccone, A. a. (1996, March). Productivity and the Density of Economic Activity. *The American Economic Review*, 86(1), 54-70. Retrieved from <https://www.jstor.org/stable/2118255>
- Collinson, R. a. (2018). The Effects of Evictions on Low-Income Households. *New York University Working Paper*. Retrieved December 2020, from https://www.law.nyu.edu/sites/default/files/upload_documents/evictions_collinson_reed.pdf

- Committee on the Judiciary, U. S. (2005, February 10). *Senate Hearing 109-1014*. (U. G. Office, Ed.) Retrieved 5 7, 2020, from Bankruptcy Reform Hearing Before the Committee on the Judiciary, United States Senate: <https://www.govinfo.gov/content/pkg/CHRG-109shrg42675/html/CHRG-109shrg42675.htm>
- Congress, U. (n.d.). *Article I, C4.2.1 Overview of Bankruptcy Clause*. Retrieved from Constitution Annotated: <https://uscode.house.gov/static/constitution.pdf>
- Correas, I. (2021). The Role of Personal Bankruptcy Protections on Entrepreneurship: Cushion v. Forgiveness. *Work In Progress*.
- Correas, I. (2022). The Role of Personal Bankruptcy Protections on Entrepreneurship: Cushion v. Forgiveness. *Work In Progress*.
- Cutler, D. G. (1997). Are ghettos good or bad? *The Quarterly Journal of Economics*, 112(3), 827-872.
- D. Audretsch, M. K. (2007). The theory of knowledge spillover entrepreneurship. *Journal of Mangement Studies*, 44, 124.
- D. B. Audretsch, M. K. (2008). Resolving the knowledge paradox: knowledge-spillover entrepreneurship and economic growth. *Res. Policy* 37 (10), 1697-1705.
- Dam, A. V. (2019, September 18). *The Surprising Holes in Our Knowledge of America's Homeless Population*. Retrieved from The Washington Post: <https://www.washingtonpost.com/business/2019/09/18/surprising-holes-our-knowledge-americas-homeless-population/>

- David Audretsch, D. H. (2015). Infrastructure and Entrepreneurship. *Small Business Economics*, Vol. 44, No. 2, 219-230.
- Desmond, M. (2015, March). Unaffordable America: Poverty, housing, and eviction. (D. Johnson, Ed.) *Fast Focus*, pp. 1-6. Retrieved from <https://www.irp.wisc.edu/publications/fastfocus/pdfs/FF22-2015.pdf>
- Diamond, R. a. (2020, June). The Effect of Foreclosures on Homeowners, Tenants and Landlords. *NBER Working Paper Series*. Retrieved November 2020, from <https://ssrn.com/abstract=3632603>
- Dobbie, W. a. (2015, March). Debt Relief and Debtor Outcomes: Measuring the Effects of Consumer Bankruptcy Protection. *American Economic Review*, 105(3), 1272-1311. doi:10.1257/aer.20130612
- Driscoll, J., & Kraay, A. (1998). Consistent Covariance Matrix Estimation With Spatially Dependent Panel Data. *The Review of Economics and Statistics*, vol. 80, issue 4, 549-560.
- Duranton, G., & Kerr, W. R. (2015, August). The Logic of Agglomeration. *Journal of Economic Literature*, J2,J6,L1,L2,L6,O1,O3,R10,R3. Retrieved from https://www.nber.org/system/files/working_papers/w21452/w21452.pdf
- Duranton, G., & Puga, D. (2020). The Economics of Urban Density. *Journal of Economic Perspectives*, 34(3), 3-26. Retrieved from <https://www.aeaweb.org/articles/pdf/doi/10.1257/jep.34.3.3>
- Efrat, R. (2006). Evolution of Bankruptcy Stigma. *Theoretical Inquiries in Law*, 7(2), 365-392.

Efrat, R. (2006, July). The evolution of bankruptcy stigma. *Theoretical Inquiries in Law*, 7(2).

doi:10.2202/1565-3404.1130

Eriksson, R., & Lengyel, B. (2019). Co-worker Networks and Agglomeration Externalities.

Economic Geography, 95(1), pp. 65-89. doi:10.1080/00130095.2018.1498741

Evans, A. W. (1986, October). Comparisons of Agglomeration: Or What Chinitz Really Said.

Urban Studies, 23(5), 387-389. Retrieved March 4, 2021, from

<https://www.jstor.org/stable/43083119>

Fair, H., & Walmsley, R. (2021). *World Prison Population List, 13th edition*. Institute for Crime and Justice Policy Research. Retrieved from

https://www.prisonstudies.org/sites/default/files/resources/downloads/world_prison_population_list_13th_edition.pdf

Fan, W., & White, M. (2003). Personal Bankruptcy and the Level of Entrepreneurial Activity.

The Journal of Law & Economics Vol 46, No. 2, 543-567.

Fonseca, R. a.-G. (2001). Entrepreneurship, start-up costs and employment. *European Economic*

Review, 45, 692-705.

FRED, F. R. (n.d.). *S&P Dow Jones Indices LLC, S&P/Case-Shiller U.S. National Home Price*

Index [CSUSHPINSA]. Retrieved May 2023, from

<https://fred.stlouisfed.org/series/CSUSHPINSA>

Fritsch, M. (2017). The Effect of New Business Formation on Regional Development. In G.

Ahmetoglu, T. Chamorro-Premuzic, B. Klinger, & T. Karcisky (Eds.), *The Wiley*

Handbook of Entrepreneurship. Wiley. doi:10.1002/9781118970812.ch17

- Fritsch, M., & Mueller, P. (2008). The effect of new business formation on regional development over time: the case of Germany. *Small Business Economics*, 30, 15-29.
doi:10.1007/s11187-007-9067-9
- Georgellis, H. J. (2006). Entrepreneurship and the Policy Environment. *Federal Reserve Bank of St. Louis Review* 88(2), 95-111.
- Glaeser, E. L. (2009). Local Industrial Conditions and Entrepreneurship: How Much of the Spatial Distribution Can We Explain? *Journal of Economics & Management Strategy*, 18(3), 623-633.
- Glaeser, E. L. (2010). Clusters of Entrepreneurship. *Journal of Urban Economics*, 67, 150-168.
- Goetz, C., & Stinson, M. (2022, February 16). *U.S. Startups Create Jobs at Higher Rates, Older Larger Firms Employ Most Workers*. (United States Census Bureau) Retrieved from United States Census Bureau Resource Library:
<https://www.census.gov/library/stories/2022/02/united-states-startups-create-jobs-at-higher-rates-older-large-firms-employ-most-workers.html>
- Goldberger, A. S. (1991). Multicollinearity: 23.3 Micronumerosity. In *A Course in Econometrics* (pp. 248-250). Harvard University Press. doi:ISBN 9780674175440
- Graves, P., Weiler, S., & Tynon, E. E. (2009). The Economics of Ghost Towns. *Journal of Regional Analysis and Policy*, 39(2), 131-140.
- Gross, K. (1986, December). Preserving a fresh start for the individual debtor: the case for narrow construction of the consumer credit amendments. *University of Pennsylvania Law Review*, 135(1), 59-152. doi:10.2307/3312037

- Hallinan, C. G. (1986). The "fresh-start" policy in consumer bankruptcy: A Historical Inventory and Interpretive Theory. *21 University of Richmond Law Review*, 49.
- Hanlon, W., & Miscio, A. (2014, December). Agglomeration: A Dynamic Approach. *Journal of Economic Literature*(Working Paper 20728). doi:10.3386/w20728
- Harwood, H. J., Napolitano, D. M., Kristiansen, P., & Collins, J. (1984). *The economic costs to society of alcohol and drug abuse and mental illness*. US Dept of Health and Human Services. Rockville, MD: RTI International. Retrieved from <https://www.ncjrs.gov/pdffiles1/Digitization/117820NCJRS.pdf>
- Henderson, J., & Weiler, S. (2009). Entrepreneurs and job growth: probing the boundaries of time and space. *Economic Development Quarterly*, 24, 23-32.
doi:10.1177/0891242409350917
- Henderson, V. (2000, January). The Effects of Urban Concentration on Economic Growth. (N. B. Research, Ed.) *NBER Working Papers*(7503), 47-71. Retrieved from https://www.nber.org/system/files/working_papers/w7503/w7503.pdf
- Hennepin, L., & Tonson, J. (1698). *A New Discovery of a Vast Country in America*. University of Southern Maine. Osher Map Library Rare Books. Retrieved from https://digitalcommons.usm.maine.edu/oml_rare_books/2
- Hoechle, D. (2007). Robust standard errors for panel regressions with cross-sectional dependence. *The Stata Journal* 7, Number 3, 281-312. Retrieved 5 27, 2020, from <https://journals.sagepub.com/doi/pdf/10.1177/1536867X0700700301#Hfootnote.14>

- Hofstede, G. a. (2000). National values and organizational practices. In C. W. N.M. Ashkanasy (Ed.), *Handbook of organizational culture and climate* (pp. 401-405). Sage.
- Holmes, T. a. (2002). Geographic concentration and establishment scale. *Review of Economics and Statistics*, 84(4), 682-690.
- Holmes, T. J. (2010). An alternative theory of the plant size distribution, with geograph and intra- and international trade. (F. R. Minneapolis, Ed.) *Staff Report 445*.
- Hopenhayn, H. a. (2018, December). From Population Growth to Firm Demographics: Implications for Concentration, Entrepreneurship and the Labor Share. *National Bureau of Economic Research Working Papers*(Working Paper 25382).
- HUD. (February 2007). *The Annual Homelessness Assessment Report to Congress*. U.S. Department of Housing and Human Development, Office of Community Planning and Development. U.S. Department of Housing and Human Development. Retrieved from <https://www.huduser.gov/publications/pdf/ahar.pdf>
- Hynes, R. a. (2004). Political Economy of Property Exemption Laws. *The Journal of Law and Economics*, Volume XLVII, 47(1), 24. Retrieved from <https://www.journals.uchicago.edu/doi/abs/10.1086/386276>
- Hynes, R. a. (2004). Political Economy of Property Exemption Laws. *Journal of Law and Economics*, Volume XLVII, 24.
- Jacobvitz, R. (2019, February 27). *A relatively short history of the bankruptcy laws in the United States*. Retrieved April 10, 2020, from NCBJ 93rd Annual Conference Blog:

<https://ncbjmeeting.org/2019blog/2019/02/27/a-relatively-short-history-of-the-bankruptcy-laws-in-the-united-states/>

Johansson, B., & Quigley, J. M. (2004). Agglomeration and Networks in Spatial Economies. *Papers in Regional Science*, 83. doi:10.1007/s10110-003-0181-z

Kacher, N. J. (2019). Three essays in regional growth, distribution, and resilience. Fort Collins, Colorado: Colorado State University. Retrieved from <https://hdl.handle.net/10217/197355>

Krugman, P. (1991). *Geography and Trade* (Eighth printing, 2000 ed.). London, England, U.K.: The MIT Press.

Local Loan v. Hunt, 292 U.S. 234 (Supreme Court of the United States April 30, 1934). Retrieved 6 5, 2020, from <https://www.loc.gov/item/usrep292234/>

Lucas, R. (1988). On the mechanics of economic development. *Journal of Monetary Economics*, 22(1), 3-42. Retrieved from <https://EconPapers.repec.org/RePEc:eee:moneco:v:22:y:1988:i:1:p:3-42>

Martin, N. (2005). The Role of History and Culture in Developing Bankruptcy and Insolvency Systems: The Perils of Legal Transplantation. *Boston College International and Comparative Law Review*, Volume 28, Issue 1I.

Martin, P. &. (2011). Spatial Concentration and Firm-Level Productivity in France. *Journal of Urban Economics*, 69(2), 182-195. Retrieved from <https://hal-sciencespo.archives-ouvertes.fr/hal-01066174/document>

- Moomaw, R. L. (1985). Firm Location and City Size: Reduced Productivity Advantages as a Factor in the Decline of Manufacturing in Urban Areas. *Journal of Urban Economics*, 17, 73-89.
- Musick, N. (2020, December). *Federal Policies in Response to Declining Entrepreneurship*. Retrieved from Congressional Budget Office: <http://www.cbo.gov/publication/56906>
- National Cancer Institute. (2020). *US County population data 1969-2020*. (E. a. Surveillance, Editor) Retrieved 5 12, 2022, from <https://seer.cancer.gov/popdata/download.html#single>
- OECD. (2023, July 6). *Employees by business size*. doi:10.1787/ceaf53c9-en
- Office of Advocacy, U. S. (2022, November 23). *2022 Small Business Profile*. Retrieved from 2022 Small Business Profiles for the States, Territories, and Nation: <https://advocacy.sba.gov/wp-content/uploads/2022/08/Small-Business-Economic-Profile-US.pdf>
- O'Flaherty, B. (2019, June). Homelessness research: A guide for economists (and friends). *Journal of Housing Economics*, 44, 1-25. Retrieved November 2020, from <https://doi.org/10.1016/j.jhe.2019.01.003>
- OMB, Office of Information and Regulatory Affairs. (2010, June 28). 2010 Standards for Delineating Metropolitan and Micropolitan Statistical Areas. *Federal Register*, 75(123), 37246-37252. Washington D.C., United States of America: U.S. Government Publishing Office. Retrieved from <https://www.govinfo.gov/content/pkg/FR-2010-06-28/pdf/2010-15605.pdf>

- Osttensmann, J., Payton, S., & Man, J. (2008). urban Location and Housing Prices within a Hedonic Model". *Journal of Regional Analysis and Policy*, 38(1).
- Peng, H., Li, B., & Liu, Y. (2022). How Social Network Influences the Growth of Entrepreneurial Enterprises: Perspective on Organizational and Personal Network. *SAGE Open*, 12(2). doi:10.1177/21582440221108178
- Pesaran, M. H. (2004, September). General Diagnostic Tests for Cross Section Dependence in Panels. *Journal of Econometrics* 69(7).
- Ponoroff, L. (2014). Constitutional Limitations on State-Enacted Bankruptcy Exemption Legislation and the Long Overdue Case for Uniformity. 88 *American Bankruptcy Law Journal*, 353.
- Primo, D. M. (2011). Bankruptcy Law and Entrepreneurship. *Entrepreneurship Research Journal*, 1(2). doi:10.2202/2157-5665.1013
- Quigley, J. M. (2001). The Economics of Homelessness: The Evidence from North America. *European Journal of Housing Policy*, 1(3), 323-336. doi:10.1080/14616710110091525
- Quigley, J. R. (2001). Homelessness in America, Homelessness in California. *The Review of Economics and Statistics*, 83(1), 37-51.
- Rinz, K. (2018, October). Labor market concentration, earnings inequality, and earnings mobility. (R. a. Center for Administrative Records, Ed.) *CARRA Working Papers*.
- Romer, P. M. (1986, October). Increasing Returns and Long-Run Growth. *Journal of Political Economy*, 94(5), 1002-1037. Retrieved from <https://www.jstor.org/stable/1833190>

- Rosenthal, S. a. (2010). Small Establishments/Big Effects: Agglomeration, Industrial Organization and Entrepreneurship. In E. L. Glaeser, & E. L. Glaeser (Ed.), *Agglomeration Economics* (pp. 277-302). The University of Chicago Press. Retrieved February 22, 2021, from <http://www.nber.org/chapters/c7984>
- Rosenthal, S. S., & Strange, W. C. (2010). Small Establishments / Big Effects: Agglomeration, Industrial Organization and Entrepreneurship. In E. L. Glaeser, *Agglomeration Economics* (pp. 277-302). The University of Chicago Press. Retrieved November 14, 2023, from <https://www.nber.org/system/files/chapters/c7984/c7984.pdf>
- Ryan Decker, J. H. (2014). The Role of Entrepreneurship in U.S Job Creation and Economic Dynamism. *Journal of Economic Perspectives*, Vol 28, Number 3, 3-24.
- S&P Dow Jones Indices LLC. (2023, July 9). *FRED Economic Data*. Retrieved 2023, from S&P/Case-Shiller U.S. National Home Price Index [CSUSHPINSA]: <https://fred.stlouisfed.org/series/CSUSHPINSA>
- Seifert, R., & Rukavina, M. (2006, Mar-Apr). Bankruptcy is the tip of a medical-debt iceberg. *Health Aff (Millwood)*, 89-92. doi:10.1377/hlthaff.25.w89
- Sieweke, J., & Santoni, S. (2020, February). Natural experiments in leadership research; An introduction, review, and guidelines. *The Leadership Quarterly*, 31(1). doi:10.1016/j.leaqua.2019.101338
- Solow, R. M. (1956, February 01). A contribution to the theory of economic growth. *The Quarterly Journal of Economics*, 70, 65-94. Retrieved from <https://doi.org/10.2307/1884513>

- Solow, R. M. (1957, August). Technological change and the aggregate production function. *Review of Economics and Statistics*, 39, 312-320.
- Sousa, M. D. (2010). The Principle of Consumer Utility: A Contemporary Theory of the Bankruptcy Discharge. *Kansas Law Review*, 58(101), 553-614. Retrieved January 11, 2021, from https://kuscholarworks.ku.edu/bitstream/handle/1808/20121/2_Sousa_Final.pdf;jsessionid=B28BB4EAE701FA6D9E78C884C00C9C5B?sequence=1
- Stegiopoulos, V., A. G., Ocampo, P., Holtby, A., Jeyaratnam, J., & Tsemberis, S. (2014). Housing First: exploring participants' early support needs. *BMC Health Service*. doi:10.1186/1472-6963-14-167
- Stellwager v. Clum, 245 U.S. 605 (U.S. Supreme Court February 4, 1918). Retrieved from <https://supreme.justia.com/cases/federal/us/245/605/#>
- Stiglitz, J. E. (1981, June). Credit rationing in markets with imperfect information. *The American Economic Review*, 71(3), 393-410. Retrieved from <https://www.jstor.org/stable/1802787>
- U.S. Bureau of Labor Statistics. (2023, January 11). *Labor Force Statistics from the Current Population Survey*. Retrieved May 5, 2023, from Concepts and Definitions (CPS): <https://www.bls.gov/cps/definitions.htm#population>
- U.S. Census Bureau. (2021, 06 27). *Business Dynamics Statistics (BDS) Explorer*. Retrieved from Business Dynamics Statistics Data Tables: <https://www.census.gov/data/data-tools/bds-explorer.html>

- U.S. Const. art. I, § 8 cl. 4. (1787). Retrieved from
<https://uscode.house.gov/static/constitution.pdf>
- Urbano, D., Aparicio, S., & D, A. (2019). Twenty-five years of research on institutions, entrepreneurship, and economic growth: what has been learned? *Small Business Economics*, 53, 21-49. Retrieved from <https://doi.org/10.1007/s11187-018-0038-0>
- Vance, C., Larrieu, R., Bergin, R., Mercado, J. R., Walden, M., & Reeser, C. (2017, September/October). A field exploration of the "expat-preneur" phenomenon. *Global Business and Organization Excellence*, 6(36), 34-43. doi:DOI: 10.1002/joe.21812
- Weisberg, R. (1986, November). Commercial Morality; the Merchant Character and the History of the Voidable Preference. *Standord Law Review Vol. 39, No 1*, 3-138.
- Weistart, J. C. (1977, Autumn). The Costs of Bankruptcy. (J. H. Moore, Ed.) *Law & Contemporary Problems*, 41(4), 107-122. Retrieved from
<https://scholarship.law.duke.edu/lcp/vol41/iss4/>
- White, M. (2005, March). A general model of personal bankruptcy: insurance, work effort, and opportunism. *American Law & Economics Association Annual Meetings*. Retrieved from
<http://law.bepress.com/alea/15th/art46>
- Whitford, W. C. (1979). A Critique of the Consumer Credit Collection System. *Wisconsin Law Review*, 1047-1126.
- Wing, C., Simon, K., & Bello-Gomez, R. (2018, April). Designing difference in difference studies: best practices for public health policy research. *Annual Review of Public Health*, 39, 453-469. doi:10.1146/annurev-publhealth-040617-013507

Woodward, W. J. (1982). Exemptions, Opting Out, and Bankruptcy Reform. *Ohio State Law Journal*, 43(335), 335-376. Retrieved 12 26, 2020, from

https://kb.osu.edu/bitstream/handle/1811/65198/OSLJ_V43N2_0335.pdf

Wooldridge, J. M. (2002). *Econometric Analysis of Cross Section and Panel Data*. Cambridge, MA: MIT Press.

Appendix I

Table I-1: FE regression results

DV: New Non-employer establishments per 100,000		
	Homestead exemption	Wildcard exemption
Total Firms per 100K pple, lagged 1 yr	-0.0954 (0.0819)	-0.1110 (0.0817)
% Tax on Long-Term investments	7.6986 (5.2842)	8.5283* (5.2840)
% Real GDP growth lagged 1 yr.	-2.9761** (1.2327)	-2.8877** (1.2368)
% Fed Real Discnt rate lagged 1 yr.	-5.6693*** (0.9034)	-5.7704*** (0.9013)
% Popltn 25+ educ. high-school or more	-6.4780** (2.8093)	-5.5638** (2.8142)
Real gdp per capita (in dollars)	0.0066*** (0.0012)	0.0067*** (0.0013)
Hwy percap lane-mls (non-local)	8337.897** (3697.22)	9343.164** (3687.25)
BAPCPA in effect (1=Y, 0=N)	-47.7830 (36.2294)	-34.4255 (35.5082)
Statute change in exemption (1=Y,0=N)	8.9880 (12.5842)	5.4435 (15.9377)
Inflation Adjusted Exemption (in \$10K)	-1.6190 (1.0254)	-23.9867 (23.5888)
Statute Chg x \$Exemp (interaction)	-0.3578 (1.1809)	5.5831 (15.6340)
R ² – within:	0.6344	0.6332
R ² – overall:	0.2311	0.2042
N	901	900
Obs per group:		
min avg max	12 17.7 18	11 17.6 183
Maximum lag		
Groups:	51	51

Appendix II

Table II-1 FE-IV 1st STAGE results for % Employment Firms > 500

	Without Bankruptcy	Models with Bankruptcy Exemption		
	All years	All years	Pre 2006	Post 2006
	(FE.IV)	(IV.B)	(IV.B.Pre)	(IV.B.Post)
% Employment in Public Sector	-0.7718 (0.0312)***	-0.7299 (0.0397)***	-0.4905 (0.0719)***	-0.7523 (0.0455)***
Median HH Income HPI adj (\$10K)	0.0148 (0.0030)***	0.0163 (0.0036)***	-0.0019 (0.0166)	0.0112 (0.0038)***
% Population below poverty line.	0.0206 (0.0161)	0.0066 (0.0175)	-0.1255 (0.0673)*	0.0174 (0.0183)
% Unemployment	0.0278 (0.0264)	0.0413 (0.0303)	-0.1019 (0.2072)	0.0399 (0.0322)
County population	0.0075 (0.0264)	0.0069 (0.0062)	0.0574 (0.0254)**	-0.0198 (0.0076)***
Population % growth	-0.0316 (0.0368)	-0.0459 (0.0389)	-0.1224 (0.1235)	-0.0221 (0.0409)
Fed Discount Rate	-0.2311 (0.2069)	-0.1943 (0.2590)	0.0730 (0.2308)	-0.2144 (0.2408)
Max State Tax on Wages	-0.1509 (0.0944)*	-0.1718 (0.0943)*	0.5111 (0.651)	0.1113 (0.1056)
Max State Tax on Long Gains	0.0640 (0.0920)	0.0725 (0.0912)	0.0205 (0.1433)	-0.2257 (0.1060)**
Wildcard Exemption (\$10Ks) Adjusted	N/A	-0.0093 (0.0046)**	0.0443 (0.0611)	-0.0076 (0.0045)*
EXCLUDED INSTRUMENTS:				
Ln Empl Mining	-0.1426 (0.0935)	-0.1895 (0.1088)*	-0.2325 (0.1385)*	-0.2186, (0.1244)*
Ln Empl Manuf	1.5668 (0.2480)***	1.6682 (0.3305)***	4.0410 (1.0725)***	1.4529 (0.3862)***
10yr Lag Empl Mining	-0.0772 (0.0484)*	0.0025 (0.0557)	-0.1301 (0.212)	-0.0393 (0.0608)
10yr Lag Empl Manuf	-0.2606 (0.1683)	-0.4496 (0.2139)**	-1.0640 (0.5830)*	-0.5031 (0.2406)**
MODEL FIT :				
F stat, Prob>F	12.69, 0.000	10.00, 0.0000	5.35, 0.0003	6.21, 0.0001
N	16052	12860	975	11626
Obs per group: min avg max	2 11 21	2 10 19	2 4 6	2 9 13
Groups:	1386	1345	263	1333
ENDOGENEITY & IDENTIFICATION Tests*, Variable: EmplPct500plus				
Endogeneity test:				
Chi-sq, p-value	9.8, 0.001	17.2, 0.000	0.02, 0.89	15.5, 0.000
Underid: Chi2, p-val	40.56, .0000	29.60, .0000	12.338, .0150	18.89, .0008
Weak id: F, p-val	12.69, .0000	10.00, .0000	5.35, 0.0003	6.21, 0.0001
Overident. all instr.	5.316, .1500	3.7380, .2912	6.326, 0.0968	1.590, 0.6617

* Underid: Kleibergen-Paap rank LM Weak id: Kleibergen-Paap Wald rank Overident: Sargan Hansen J stat.