

Bankruptcy Law, Entrepreneurship, and Economic Performance*

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Abstract

Using state-level data, we explore the link between bankruptcy laws and entrepreneurship, and we then examine the impact of entrepreneurship on economic performance. We find that more generous bankruptcy laws lead to increased levels of self-employment in some cases, though the effect is non-monotonic in the level of assets protected by the law. Counter to the conventional wisdom, more generous laws are linked to *lower* levels of “innovative” entrepreneurship. In addition, we find that economic growth is enhanced by entrepreneurship. The paper concludes by suggesting why developing more refined measures of entrepreneurship is necessary to better understand the impact of public policies on this phenomenon.

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Introduction

Entrepreneurship, typically construed as the creation of small, and sometimes innovative, businesses, is widely considered a vital component to the success of any economy, and entrepreneurship is often viewed as central to the higher levels of economic growth in the United States relative to Europe (e.g., Hoenig 2005, Schramm 2006). If the conventional wisdom is correct, then policies shown to produce higher levels of entrepreneurship should generate improved economic performance. Governments, therefore, should structure public policies to encourage more entrepreneurship.

Policies such as bankruptcy laws that allow individuals to keep a portion of their assets and get a “fresh start” are thought to foster entrepreneurship because they absorb much of the risk that creating a new business necessarily entails, since most new enterprises fail. If potential entrepreneurs have a choice between working for somebody else and starting their own business, they will select the latter only if the expected benefits are higher. Since the full benefits of entrepreneurship are often not internalized, entrepreneurship may be underprovided unless some partial insurance against those risks is provided. To the extent that bankruptcy laws and other policies provide partial insurance or otherwise reduce the costs of failure, entrepreneurial activity should increase.

Public policies that encourage entrepreneurship by providing insurance against a downside risk also introduce a moral hazard problem. Because insurance reduces the costs of an unfortunate outcome and blunts the edge of failure, it may lead individuals to start enterprises that are unlikely to succeed. It would be surprising if these policies did not encourage more individuals to start businesses, in the same way that it would be surprising if individuals with a managed care plan went to the doctor less often than those individuals without any health insurance. And, in fact, there is increasingly strong evidence that levels of entrepreneurship in the U.S. states are influenced by bankruptcy laws, though not always in a monotonic fashion (e.g., Fan and White 2003; Georgellis and Wall 2006).

There is also an adverse selection problem present, similar to Akerlof's (1970) market for lemons. To the extent that creditors are aware that borrowers have the protection of bankruptcy laws

and cannot fully discriminate between high-risk and low-risk projects, interest rates will tend to be higher, which may cause individuals with low-risk projects to drop out of the pool, leaving only those individuals with less meritorious proposals. In the extreme, the end result is the collapse of the credit market for new projects (Hynes and Posner 2001).

While some individuals may view entrepreneurship as an important activity to encourage irrespective of its consequences, most presumably view entrepreneurship as valuable because of its economic benefits. Given the presence of a moral hazard and adverse selection problem, though, examining only whether more individuals act as sole proprietors (the typical measure of entrepreneurship) may provide a misleading impression of the impact of these laws on economic outcomes. If these laws are encouraging entrepreneurship that is likely to fail, then the associated costs for society of these negative consequences may be larger than the benefits from encouraging an individual on the fence to pursue a worthwhile project.¹

To our knowledge no statistical work has connected public policies, entrepreneurship, and economic performance, despite the many claims made about these links. Fan and White (2003), in an important piece, caution against more stringent bankruptcy laws. They write,

However, our analysis suggests that an unintended consequence of these reforms would be a reduction in the attractiveness of self-employment. Instead of being able to shelter their future incomes and some or all of their assets from creditors if their businesses fail, owners of failed businesses would face heavy taxation of their future earnings to repay their old business debts. ... While some self-employment ventures under the current bankruptcy law are probably inefficient, the proposed changes in personal bankruptcy procedures make the small-business environment so much tougher that both efficient and inefficient ventures are likely to be eliminated. The result could be a slower rate of growth for the U.S. economy (Fan and White 2003, 563-564).

Our paper addresses this claim by examining variation in bankruptcy laws in the U.S. states from 1980-1996. We first provide a theoretical foundation for why the effect of such policies is far from certain. We focus on the countervailing effects just described: on the one hand, policies that provide

¹ An analogy would be to argue that government policies promoting greater use of health care are automatically beneficial to society, when in fact needless tests, excessive visits to the doctors, and other inefficient uses of the system would show up as “greater health care.” Most health care economists are interested in whether policies lead to improved health *outcomes*. We adopt an analogous focus in this paper.

insurance are likely to encourage entrepreneurship. On the other hand, by insuring individuals against a portion of the downside to a risky activity, *reduced* economic activity could result as individuals take on ill-advised activities. The moral hazard problem can be mitigated to some degree, since creditors can adjust their behavior in the presence of generous legal provisions by reducing the availability of credit or increasing interest rates. This, however, introduces the adverse selection problem described above.

Empirically, we focus on the generosity of property exemptions in personal bankruptcy laws. Generous bankruptcy laws reflect a view that individuals should be able to get a “fresh start,” unencumbered by previous failed enterprises. Using state-level data, we explore whether bankruptcy laws influence entrepreneurship and, in turn, examine the impact of entrepreneurship on economic growth and unemployment. Following Baumol et al. (2007), we distinguish between replicative entrepreneurship (e.g., opening another McDonalds) and innovative entrepreneurship (e.g., starting Google). We utilize two different measures of entrepreneurship: self-employment (which necessarily includes both replicative and innovative entrepreneurship) and venture capital spending (a proxy for innovative entrepreneurship). We find that generous bankruptcy laws lead to increased levels of self-employment, but this effect is non-monotonic in the level of assets protected by the law. Moreover, these exemptions are linked to *lower* levels of innovative, as opposed to replicative, entrepreneurship. In addition, we find that economic growth is increasing in both measures of entrepreneurship. This finding points to the importance of entrepreneurship in fostering economic success.

Our paper suggests that tighter bankruptcy laws may not have the significant (negative) impact on entrepreneurship and economic performance feared by many. In the discussion and conclusion, we offer the implications of our findings for scholars and policymakers and discuss the importance of constructing better measures of entrepreneurship that separate small-business start-ups into those which are truly innovative from those which replicate an existing business model.

Failure and Entrepreneurship

U.S. culture tends to view failure as not only acceptable, but as a natural part of the entrepreneurial process. Familiar sayings include “I learn more from failure than I do from success” or the quote, often attributed to Edison, that “I haven’t failed, I’ve found 10,000 ways that don’t work.” Failure in business is viewed as an economic badge of honor. This cultural view—that failure is acceptable and perhaps even noble—should encourage risk-taking behavior and therefore positively influence entrepreneurship, but it is not universally shared. The World Bank, in advocating for more lenient bankruptcy laws, wrote:

[Harsh] laws discourage the use of bankruptcy. And they dampen entrepreneurship: studies in the United States show that entrepreneurs try several business ideas before succeeding. Punishing fraud is justified, but bankruptcy is different. An entrepreneur can have bad luck or make mistakes. Bankrupt debtors face stigma anyway. Why compound it with legal penalties? (World Bank 2005, 71).

U.S. legal cases regarding bankruptcy law reflect this perspective. In perhaps the most famous such case, *Local Loan Co. v. Hunt*, which dealt with the Bankruptcy Act of 1898, the Supreme Court’s decision stated,

This purpose of the act has been again and again emphasized by the courts as being of public as well as private interest, in that it gives to the honest but unfortunate debtor who surrenders for distribution the property which he owns at the time of bankruptcy, a new opportunity in life and a clear field for future effort, unhampered by the pressure and discouragement of pre-existing debt (292 U.S., at 244).

Baumol et al. (2007, 100-101) write, “Effective bankruptcy protection is critical to promoting entrepreneurship, since without it, many would-be entrepreneurs would be unwilling to take the risks of starting a business, knowing that if they fail they could lose everything, on top of facing the severe social stigma of having declared bankruptcy. In fact, it is safe to speculate that there is a strong negative correlation between the strength of the stigma and attitudes toward entrepreneurship in any given society: the more society penalizes failure, the less entrepreneurship it will get.”²

² To be sure, some have challenged this view that Americans view business failure without shame. Sandage (2005) argues that failure through bankruptcy became an identity for many men in American history, rather than just something that happened to them. In the 1850s, many San Francisco business owners chose not to file for bankruptcy because it was

This perspective on failure stands in stark contrast to Europe's. Landier (2006, 24) quotes Eric Benhamou, a French engineer who became an entrepreneur in the Silicon Valley and led 3Com and Palm, among other companies:

Twenty years ago, as a student at Stanford, I realized how naive I had been to believe I could start a business in France.[...]in France, you keep all your life the stigma of a failure. Here [in Silicon Valley] it is the mark of your entrepreneurial spirit ...In France, it is common practice to give up on growth in order to limit risk. Here, when you start a venture, your goal is to become number one of your sector.

Seymour Martin Lipset, in discussing Latin American attitudes toward risk in the mid-20th century, notes that aversion to risk may in part be due to viewing bankruptcy as a disgrace to one's family instead of as regarding it as a simple business decision (Lipset 1970, 95). While these are national, regional, and cultural perspectives, and the variation in policies across the world is dramatic, the range of attitudes and, thus, policies in the U.S. states is more limited. Therefore, a focus on the bankruptcy laws of the states allows for more a fine-grained analysis of the laws and their impact. We propose to capture a "tolerance for failure" at the state level by examining bankruptcy laws, which provide a measure of insurance against bad outcomes resulting from risky behavior.

Bankruptcy Laws

In the United States, it is relatively easy for an individual to file for bankruptcy and, as a consequence, have one's debts completely discharged and keep a portion of one's assets. In 2005 over two million individuals filed for personal bankruptcy under Chapter 7 of the U.S. Bankruptcy Code. Twenty percent of personal bankruptcy filings list business debts, and these debts comprise about half the total liabilities of those who file (Mathur 2007). Moreover, Lawless and Warren (2005) argue that a significant portion of bankruptcies classified as "individual" bankruptcies ought to instead be classified as business bankruptcies. While bankruptcy laws were tightened in late 2005, resulting in many fewer

perceived as "unmanly" (Sandage 2005, 7). A Boston merchant remarked in the 1840s: "Failures that arise from inevitable misfortune alone, are not so numerous as they are generally supposed to be. In most cases insolvency is caused by mistakes that originate in personal character" (Sandage 2005, 46). And in modern times, a Silicon Valley counselor offers that "shameless failure as a tool of innovation 'might be the overriding mentality, but when the entrepreneur is going through [failure], all that philosophy flies out the window'" (Sandage 2005, 273).

bankruptcy filings in 2006 (down by about 70% in 2006 from 2005), they still afford significant protections to individual debtors, especially those with business debts. Bankruptcy law is governed by many complex provisions, and popular legal books offer a step-by-step guide to filing (e.g., Elias et al. various years).

By discharging debts, bankruptcy laws are redemptive and reflect a change from the era of English law under which uncooperative debtors could be put to death (Jackson 1986). To this day, in other nations, a business failure can result in criminal charges or the inability to lead another company (World Bank 2006). Bankruptcy carries little stigma in contemporary American U.S. society, but this is a relatively recent phenomenon. The number of personal bankruptcy cases has increased from around 300,000 in 1980 to the two million figure cited above for 2005. While an increase in consumer debt undoubtedly contributed to this increase, part of the change also reflects a new perspective on filing (Peterson 1991; Romano 1991). To be sure, bankruptcy is still viewed as an unfortunate event. In a 1993 *Worth* magazine poll 76% of individuals who filed felt “just terrible” about doing so, and a 1991 CBS News-*New York Times* poll found that 55% of respondents would either not do business or be reluctant to do business with an individual whose business went bankrupt. But general attitudes are still sympathetic toward struggling small businesses. For instance, a 1982 Harris poll found that 70% of Americans favored providing federal money for loans to small businesses that are near bankruptcy.³ Bankruptcy laws, therefore, should encourage entrepreneurial behavior in part by reducing the stigma of failure.

An individual who files for bankruptcy can keep some personal possessions and a portion of his or her home equity. The latter is referred to as a homestead exemption. Bankruptcy laws differ across the states. There is a federal set of exemptions, but under the Bankruptcy Reform Act of 1978 states may opt-out of the federal exemptions and institute their own. Many have chosen to do so, but as Hynes, Malani, and Posner (2004) have shown, state exemptions and the opt-out decision reflect historical state-

³ All polling data taken from Roper’s iPOLL databank.

level exemptions. Therefore we view them as exogenous institutions in this paper. The laws can be linked to a state's generosity towards those who have fallen on hard times, as well as the strength of creditor interests in that state.

There is a large theoretical and empirical literature regarding bankruptcy law and entrepreneurship. (For a wide-ranging review of the bankruptcy law literature, see White (2005).) While an increase in the generosity of homestead and other exemptions may stimulate entrepreneurship by providing insurance against downside risk and by offering a "fresh start" through debt discharge (Han and Li 2004, Landier 2006, Ayotte 2007), it will also lead to a response by creditors, who may increase interest rates or leave the market entirely (Fan and White 2003). Thus, entrepreneurship may not be monotonically increasing in exemption levels, or if the effects are monotonic, they may increase at a declining rate.

There is strong support for the claim that creditors respond to bankruptcy exemption levels. Berkowitz and White (2004) find that small businesses have a harder time receiving credit and pay higher interest rates in states with unlimited homestead exemptions compared to states with low exemptions. Gropp, Scholz, and White (1997) find that more generous exemptions open up credit availability to high-asset households, due to a large increase in demand, but close off opportunities for households with low assets. On net, however, more generous exemptions lead to fewer opportunities to take out loans. Berkowitz and Hynes (1999) find that bankruptcy laws do not affect the market for secured credit, such as home mortgages, but Yin and White (2001) reach the opposite conclusion in a separate data analysis. Grant (2003) finds that higher exemptions limit credit but still have beneficial effects in helping households insure against negative shocks.

In addition, there is at least indirect evidence that higher bankruptcy exemptions encourage greater risk-taking. In a novel analysis, Persad (2005) finds that individuals in states with higher bankruptcy exemptions tend to have riskier investment portfolios. The intuition is that by providing some consumption insurance, higher exemptions encourage individuals to take greater risks in investing.

There is, however, mixed evidence that higher exemptions lead to increased *filings*, in part because debtors always have the option of defaulting and because the limits may not bind for many Americans (Hynes and Posner 2001).

The next question, then, is how bankruptcy laws affect the decision to start a business, given the actions of creditors. The impact can reflect both the decision of an individual to start a business, and it may also reflect a Tiebout effect, as individuals may move to a neighboring state and start a business in that state. Mathur (2005) finds both of these effects in a spatial analysis that accounts for bankruptcy exemptions in neighboring states. Higher exemptions in neighboring states decrease the likelihood of starting a business in one's home state, while home-state exemptions are positively linked to entrepreneurship. Using data from the Survey of Income and Program Participation panels and 98,000 observations, Fan and White (2003) find a remarkably large effect of these laws on whether an individual owns a business; moving from the lowest exemptions to the highest increases the probability of owning a business by 35%. Similarly, Georgellis and Wall (2006) find an S-shaped relationship between exemptions and entrepreneurship from 1991 to 1998, with a negative effect initially, followed by a small positive effect, and then another negative effect; they use an aggregate-level analysis rather than individual-level measures. Building on this work, Garrett and Wall (2006) find a similar effect. Armour and Cumming (2008) use cross-national data and find that generous bankruptcy laws cross-nationally have a positive effect on entrepreneurship.

The Link to Economic Performance

If more generous bankruptcy laws lead to more innovative entrepreneurship, then we should observe improved economic performance as a consequence. (It is much less clear, however, that replicative entrepreneurship is growth-enhancing.) The typical measure of economic performance is growth. Another measure of economic performance is unemployment, and the effect of more entrepreneurship should be to reduce unemployment rates. To the extent that moral hazard or adverse

selection problems result from more lenient bankruptcy laws, the effects of these laws on economic performance will be more limited.

The link between entrepreneurship and growth is often made via “new growth theory,” which views knowledge spillovers as crucial to growth (Romer 1986, Audretsch and Thurik 2001, Acs et al. 2005, Audretsch et al. 2006). Schmitz (1989) suggests that it is imitation by entrepreneurs, and not the creation of new knowledge (Romer 1986), that produces growth. Schmitz assumes that no private information exists, and that in imitating existing procedures new knowledge emerges as a byproduct. Regardless, it is this “spillover” effect of entrepreneurial activity that society, in theory, wants to encourage because it otherwise may be underprovided.

Cross-national work tends to support the claim that entrepreneurship and economic performance are linked (e.g., Audretsch and Thurik 2001, Acs et al. 2005, Audretsch et al. 2006, Lachenmaier and Rottmann 2007). In a study of the United States, Acs and Armington (2006) find that new firm creation is associated with higher employment growth in the regions in which those firms are created. However, Acs (2006) distinguishes between “necessity” and “opportunity” entrepreneurship. The former is likely to emerge when other options are undesirable, while opportunity entrepreneurship occurs when an individual sees that a business opportunity exists. Opportunity entrepreneurship should be growth-producing, while necessity entrepreneurship will not be. Acs’s examination of cross-national data offers preliminary support for this perspective.

In sum, then, “innovative,” “opportunity” entrepreneurship should be linked to improved economic performance. To the extent, however, that “necessity” or “replicative” entrepreneurship is encouraged by an increased tolerance for failure, we should expect limited or perhaps even negative effects of public policies intended to stimulate entrepreneurship on economic performance.

The Role of Taxation and Regulation

To examine how bankruptcy laws compare to other policies, we also study the role of taxation in this paper. The literature treating taxation as a means of insuring against risk was begun by Domar and

Musgrave (1944, 389), whose seminal paper argues that “[b]y imposing an income tax on the investor, the Treasury appoints itself as his partner, who will always share in his gains, but who share in his losses will depend upon the investor’s ability to offset losses against other income.” A high marginal tax rate provides some measure of risk insurance, but as Gentry and Hubbard (2004) note, if individuals are risk-averse then the impact of the entire tax schedule (not just the marginal rate) becomes relevant. Cullen and Gordon (2007) argue that because corporate tax rates are lower than personal income tax rates, individuals can incorporate when they become profitable but remain as sole proprietors while incurring losses (and thereby receive a bigger tax deduction). High personal tax rates, then, should stimulate entrepreneurship, assuming that personal income taxes remain higher than corporate tax rates. While Cullen and Gordon (2007) find evidence that high marginal tax rates spur entrepreneurship, Gentry and Hubbard (2004) find the opposite to be the case and also find that the progressivity of the tax system has a negative effect on entrepreneurship. In addition, Georgellis and Wall (2006) and Garrett and Wall (2006) find a U-shaped relationship between personal income tax rates and levels of entrepreneurial activity. More generally, the evidence on tax rates and entrepreneurial entry is mixed.

Taxes may also have a positive effect on growth (and entrepreneurship) to the extent that higher taxes reflect a well-maintained infrastructure and high quality of government services. High-performance schools, public transportation, and roads all contribute to a quality of life that may help company formation and attract employees.

That said, high marginal tax rates or progressive tax systems may have (other) negative effects, making the business climate generally inhospitable. For instance, Rosen (2005) finds that higher taxes are associated with slower growth, smaller increases in capital accumulation, and smaller job growth. This is intuitive. A higher tax rate may induce one to become an entrepreneur because it insulates against downside risk or provides lower taxes (compared with corporate tax rates), but once a business is successful high taxes hamper growth. In a cross-national analysis, Djankov et al. (2008) find that

high corporate taxation hampers entrepreneurship. Even if we observe that high tax rates spur entrepreneurship, we may find that the effect on economic growth is mixed.

More generally, a state's legal and regulatory environment may encourage or discourage entrepreneurship. States that are known for imposing significant red tape to form or run a business may be at a disadvantage relative to states which make starting a business easy. There are no reliable measures of the regulatory environment in a state for the time period under study, but we believe that our measure of overall tax burden taps into the legal and regulatory environment, at least to some degree, and sidesteps the debates over marginal taxation.

Data Analysis

We analyze data on entrepreneurship and economic performance from 1980-1996 in the U.S. states.⁴ Standard errors are adjusted for clustering by state (Bertrand, Duflo, and Mullainathan 2004; Primo, Jacobsmeier, and Milyo 2007). All analyses include state and year fixed effects to account for unobserved heterogeneity in the data.

There are two dependent variables in our analysis: entrepreneurship and economic performance. We measure entrepreneurship in two ways.⁵ Our first measure of entrepreneurship is total non-farm proprietors employment divided by the total number of employees in a state. This is a conventional measure in the scholarly literature, but it is problematic. The category of self-employment is incapable of distinguishing replicative entrepreneurship from innovative entrepreneurship. Armour and Cumming note, "Our data give us no direct insight as to the relative quality of the projects that are 'brought to market' by entrepreneurs in systems with forgiving bankruptcy laws as opposed to those with harsh consequences for defaulters" (2008, 17). Our solution to this difficulty builds on the argument of Kreft

⁴ In the specifications using venture capital data, 1980 is omitted due to the lack of data for the ten-year lag (1970).

⁵ We also explored using initial public offerings (IPOs) in a state as a measure of entrepreneurial activity, as well as technology-related initial public offerings. While the venture capital measure is not perfect, the IPO measure is presumably even noisier, as it includes companies at various stages of development and those that would not be considered "innovative." Therefore, we were not surprised when this variable performed poorly compared with the venture capital measure. We also explored the possibility of examining what portion of a state's GDP was generated by innovative industries; however, it was not possible to develop a reasonable approach for separating industries in this way, given available data.

and Sobel (2005) that venture capital inflows to a state *reflect* rather than *cause* entrepreneurship. Following this result, we use venture capital (VC) inflows as a proxy for innovative entrepreneurship, since venture capitalists typically do not fund the opening of a replicative business in a mature market. Of course, venture capital is a tiny part of overall financing for new businesses, which includes angel investors, friends, family, and banks. However, for our measure to be useful, all that has to be true is that innovative entrepreneurship tends to be larger as VC funding increases.

We use two measures of economic performance. Economic growth is defined as the percent change in real per capita state income from one year to the next. Unemployment is defined as the percentage of the workforce that is currently without a job. Because entrepreneurship and growth may be endogenous, tax revenues may be tied to growth, and given that entrepreneurial ventures need time to generate an economic impact, we adopt an approach similar to Glaeser (2007) and use the ten-year lag of entrepreneurship as an independent variable in the economic performance specifications.⁶

We include bankruptcy laws only in the specification with entrepreneurship as a dependent variable, since we have no theoretical reason to believe that bankruptcy laws have a direct impact on economic growth; any small effect they might have will be captured in part by state fixed effects. Our measure of bankruptcy laws is bankruptcy exemptions in a state, which is the sum of the homestead exemption, motor vehicle exemption, and cash and/or “wildcard” exemptions, adjusted for inflation. This data was generously provided by Hynes, Malani, and Posner (2004). Their measure of exemptions accounts for unlimited homestead exemptions by translating these into dollar amounts based on the highest exemptions in other states.

We construct several measures of bankruptcy laws. First, we consider just the dollar values as used in the Hynes, Malani, and Posner study. Second, we place the exemptions into quartiles, since small changes in the laws may not have large effects. Third, we consider a variety of functional forms,

⁶ Some authors (e.g., Shane 2008) have found a negative relationship between growth and contemporaneous levels of entrepreneurship. Since the effects of entrepreneurship are often felt years down the road rather than immediately, this negative relationship is in many ways unsurprising. We experimented with shorter lags, and we find that to find statistically significant effects requires lags of about 10 years.

including the log of the exemption, a cubic function, and a quadratic function. Because we are running state fixed effects, we cannot include an indicator variable to address unlimited homestead exemptions, which are present in 15% percent of the observations. To address the fact that states with unlimited exemptions (and those with extraordinarily high exemptions) may not be comparable to other states, we re-run the entrepreneurship analyses dropping the seven states with unlimited exemptions during the time period under study, as well as another state with a very high exemption.

We use a simple measure of taxation and regulation: the state's tax burden, or percentage of income paid out in taxes to all levels of government, as calculated by the Tax Foundation based on data from the Bureau of Economic Analysis. This measure does not make distinctions about how taxes are raised (corporate income tax, individual income tax, etc.), but it serves the purpose of capturing how onerous taxation is in a state, which is a valuable measure because it tells us both about taxation as well as the net effect of taxes on a state's attractiveness for prospective businesses. Control variables included in both the entrepreneurship and economic performance equations include population (in thousands), adherents to a religion per capita⁷, population growth, real state personal income, and the percent of individuals 25 and older with a college degree. Venture capital data is from the Thomson VentureXpert database. Demographic data comes from the Census Bureau, and personal income, economic growth, and sole proprietorship data comes from the Bureau of Economic Analysis. Unemployment data is taken from the Bureau of Labor Statistics. Religiosity is taken from the 1980, 1990, and 2000 surveys of churches and church membership conducted by the Glenmary Research Center.⁸ All financial data is

⁷ The religious notion of redemption, typically associated with Christian religions but present in Islam and other religions, has parallels to bankruptcy in that both allow one to wipe the slate clean and move forward without fear. There is limited research linking religiosity to entrepreneurship in a rigorous way. Dodd and Seaman (1998) and Carswell and Rolland (2004) find little link between one's religion and entrepreneurship, and Dodd and Seaman (1998) also find that there is little difference between the religiosity of entrepreneurs and non-entrepreneurs. That said, if a high level of religiosity in a state, by reflecting a culture supportive of risk-taking, leads to entrepreneurship, then it may lead to higher growth and lower unemployment, as well. (As Barro and McCleary (2003) have shown, religious belief is potentially endogenous to growth. We do not account for this in our study, though.) There are also historical links between bankruptcy law and the Bible. Oleck (1953, 3) writes, "The Bible made many and various provisions as to the rights and liabilities of debtors and creditors, which are the basis of our law...", and he views the Old Testament as "especially fundamental" in this regard (1953, 16). Sullivan, Warren, and Westbrook (1989) view Biblical jubilees—a forgiveness of debt every seven years—as a foundation for modern law.

⁸ Ideally, we would like to use large-scale surveys, like the Survey of Income and Program Participation, and see if religiosity affects behavior via an individual-level analysis. Unfortunately, the Census Bureau is prohibited from asking about religion

in real per capita 1996 dollars, using the Consumer Price Index (CPI). Summary statistics appear in Table 1. In Table 2, we present the average bankruptcy exemption levels by state over the time period 1980-1996 (Hynes, Malani, and Posner 2004).⁹

[Insert Tables 1 and 2 About Here]

Results

We begin by examining the determinants of economic growth and unemployment in the U.S. states. The results are presented in Table 3. The lagged level of entrepreneurship (regardless of how entrepreneurship is measured), per capita income of the state, and population growth all have a positive effect on economic growth. The effect on unemployment is in the expected direction and statistically significant for the self-employment measure (but in the wrong direction and not statistically significant for the venture capital measure). In terms of substantive significance, if the percentage of individuals who are sole proprietors increases by one percentage point, growth a decade later will be greater by a quarter percent and unemployment will be lower by about .4%; if venture capital inflows to a state increase by \$10 per capita, growth a decade later will be higher by .08%. Given that the mean level of growth is 1.2% and the mean level of unemployment is 6.6%, this is a substantively significant impact. A one percentage point increase in population growth translates into increased growth of .85% and about a .75% lower level of unemployment. This taps both the effect of population growth for keeping an economy humming as well as the fact that population growth often reflects the interest in individuals

by Public Law 94-521, so the Glenmary Research Center data is the best available source. Information in intermediate years is acquired via linear interpolation. An alternative measure, religious establishments (e.g., churches, mosques, temples) per capita, is available, but this value may depend on population density and other factors, where the number of adherents should be unaffected by such factors. We are aware of no state-level measures of attendance at religious services, another way to capture religiosity.

⁹ Many other variables might influence economic growth and entrepreneurship: These include deregulation of banks (Black and Strahan 2002), the presence of a “creative class” (Florida 2002), the cost of starting a business and regulations regarding corporate forms, and the regulatory environment in the state. While all of these features are plausible candidates for inclusion in our analysis, they are either unavailable for the years under study, are endogenous to entrepreneurship and/or growth, or are captured by other more proximate variables in the analysis. For instance, a variable like the state’s regulatory environment will be closely linked to the tax burden in the state. To take one example, the U.S. Economic Freedom Index calculated for 2004 by the Pacific Research Institute correlates at about .5 with the state’s tax burden, which is included in our analysis. As another example, political variables (like whether the governor is a Democrat or a Republican) should not have a direct influence growth and entrepreneurship. To the extent that they have an influence, it will be on the resulting decisions (like the state’s tax burden, etc.).

in moving to states with solid economic prospects. Education appears to have a negative effect on growth and a positive effect on unemployment; we speculate that this perverse result may be due to the fact that individuals with higher levels of education tend to locate in urban areas, which often have high poverty rates.

The variable that has a very large negative effect on growth is the tax burden in the state. If governments take just one additional percent of state income, growth drops by between .2 and .4%. High taxes (and the associated levels of regulation that are typically found in high-tax states) clearly stifle growth. They do not have a statistically significant effect on unemployment, though the sign of the effect is in the expected direction. One possibility is that high tax states tend to have high levels of government employment that keep unemployment rates lower. Population levels and religiosity have no effect on growth or unemployment.

[Insert Table 3 About Here]

We present six sets of results when entrepreneurship, measured as self-employment, is the dependent variable. First, we measure bankruptcy exemptions in dollars, a quadratic function, and a cubic function. Second, we use two samples: all states (see Table 4) and those states with total exemptions below \$200,000. Two other measures of bankruptcy laws—the quartile into which an exemption falls and the log of bankruptcy exemptions—were never statistically significant, and the results are not reported here. The results for the restricted sample are similar to those with the full sample, so these are not presented here. We could not include an indicator variable for the presence of an unlimited homestead exemption because this did not vary within state during the time period; we therefore could not also use state fixed effects in such a specification. Given that we expect there to be significant unobserved heterogeneity in the data, we opted for leaving state fixed effects in all specifications.

[Insert Table 4 About Here]

There are several interesting results. First, tax burden does not appear to have a statistically significant effect on self-employment. This finding is counter to expectations. One possibility is that the total tax burden may drive decisions about whether to *grow* a business or where to locate a business once it is off the ground, but it may not have a huge effect on the decision to start a business compared to remaining an employee. Second, population growth has a *negative* effect on self-employment. This is explained by the fact that growth into a state is likely to consist of a lower proportion of entrepreneurs than already exist in the state. Third, education has a positive effect on entrepreneurship. Fourth, per capita income has a negative effect on entrepreneurship, though this effect is statistically significant in only some specifications. Finally, church membership and population have statistically insignificant effects on entrepreneurship.

Turning now to bankruptcy laws, for the complete and restricted samples, the level of bankruptcy exemptions does not have a statistically significant effect on self-employment, consistent with previous work. In the full sample, the quadratic function does not have a statistically significant effect, but the cubic function does. In the restricted sample, both the quadratic and the cubic functions achieve statistical significance.

The implication is that the effect of bankruptcy exemptions initially is positive, but once they reach about \$90-\$100K, the effect turns negative before becoming positive again at higher amounts. In addition, the marginal benefit to additional bankruptcy exemptions declines as the exemption level increases. For instance, increasing the bankruptcy exemption level from \$50K to \$75K increases entrepreneurship by about .17 percent, but increasing it from \$75K to \$100K increases it trivially, by less than .05 percent.

When these regressions are re-run using our measure of innovative entrepreneurship—venture capital inflows—we find that these laws have a negative effect on entrepreneurship for the entire range of exemption levels. The level of exemptions narrowly misses statistical significance in the main specification, but when we restrict the sample to states with exemptions below \$200,000, the level

becomes statistically significant. When we use the log, cubic function, or quadratic function of the exemption levels, they are statistically significant in all specifications. Quartiles of the exemption levels are never statistically significant. See Table 5 for the results using levels, the quadratic function, and the cubic function in the full sample.

[Insert Table 5 About Here]

These results are substantively significant (a \$100,000 increase in exemption levels leads to a decline of at least \$8 per capita in venture capital funding), striking, and unexpected. A possible explanation for these findings is that credit markets in states with high exemption levels are especially cautious about high-risk projects, making it hard for innovative entrepreneurs to get off the ground and get to the position where a venture capitalist is interested in their ideas. We had expected to find no relationship here, consistent with the view that those with innovative and cutting-edge ideas are likely to find funding for them, even if self-funding is not an option, while those who may be pursuing more marginal projects may benefit from more generous bankruptcy exemptions. In the end, then, our findings suggest that innovative entrepreneurship may actually be hindered by generous bankruptcy exemptions.¹⁰

Discussion and Conclusion

The results of this paper are consistent with previous work showing that generous bankruptcy exemptions in the U.S. states encourage self-employment, albeit in a non-monotonic fashion. Ours is the first to analyze the impact of innovative entrepreneurship on state-level economic performance. We show that entrepreneurship enhances growth, and surprisingly, we find a negative relationship between generous bankruptcy laws and innovative entrepreneurship.

What are the implications for our understanding of the role that public policies have in shaping entrepreneurship and economic performance in the U.S. states? First, our results show that the fears

¹⁰ Hasan and Wang (2008) also study the impact of bankruptcy laws on venture capital funding, and their general findings are similar.

surrounding reduced entrepreneurship due to stricter bankruptcy laws may be overstated.¹¹ If anything, stricter laws may make the environment more favorable to innovative entrepreneurs seeking to get to the stage where they can seek funds from angel investors or venture capitalists.

It is also important to note that this analysis does not extend beyond the U.S. states in the sense that we are considering here a set of very similar policies, all of which allow for debt discharge. In many other countries, debt discharge is not allowed, so understanding the effect of different exemption levels is unhelpful. Further cross-national work is needed in this regard. In addition, a pro-growth policy may require generous *corporate* bankruptcy policies. For instance, in a cross-national analysis, Acharya and Subramian (2007) find that weaker creditor rights encourage innovation in technologically innovative industries.

Second, if one is interested in developing a pro-growth policy (as opposed to just encouraging entrepreneurship), then a focus on the tax burden of a state would be a more productive avenue to pursue than changes in personal bankruptcy laws. Reducing the tax burden in a state by just one percentage point leads to a .2 - .4 percentage point increase in growth. The particular forms that taxation takes may also have an effect on entrepreneurship, though the evidence on this, as discussed above, is mixed.

Third, our results point the way toward future work in this area. We lack well-defined measures of regulatory burdens in the states; better measures would help us understand how regulations influence entrepreneurship. In addition, it is difficult to distinguish between replicative entrepreneurship and innovative entrepreneurship, which are perhaps best viewed as lying at opposite ends of a continuum. Our self-employment results, therefore, by necessity lump together very different sorts of businesspeople. We have provided a start toward separating these two groups in this paper by using venture capital funding as a proxy for innovative entrepreneurship, but more work remains to be done.

¹¹ Reasonable people can disagree about whether the recent reforms, for instance, are unfair to those who fall on hard times (as opposed to those who have a failed business).

Future work should also explore whether intermediate outputs from increased entrepreneurship, such as greater R&D, affect economic performance.

Developing insights into the role of institutions and public policies on these different types of entrepreneurship hinges on solid measures. In a recent book, Shane (2008) argues that policies directed toward entrepreneurship are misguided, but he takes as his definition of entrepreneurship from Merriam-Webster's Online Dictionary as "the activity of organizing, managing, and assuming the risks of a business or enterprise" (2008, 2) and measures this both by looking at business ownership and self-employment. Given this starting point, it is not surprising that he finds entrepreneurs to be a less-than-transformative force in society and produces statements such as this one: "The United States is not a very entrepreneurial country" (Shane 2008, 7). By contrast, the perspective of our analysis is that transformative, innovative entrepreneurship is what drives economic performance. Shane may be correct, but trivially, that public policies ought not encourage an excessive amount of entrepreneurship. Which analyst would disagree? Our concern here, rather, is that policies that are improperly designed or focused on the wrong sorts of start-up may lead to *lower-than-optimal* levels of entrepreneurship. To find out what the basket of efficient and effective policies looks like, we need (a) better theory and (b) better data.

This paper is a first step toward thinking about the role of a state's social, legal, political, economic, and cultural "infrastructure" for entrepreneurship. For instance, religion, an important component of American culture, was not a statistically significant predictor of entrepreneurship, but this may be due to data issues rather than the lack of any relationship. The study of religion and economics is a nascent field, so building on existing work and thinking about how religion and other social and cultural institutions may encourage or discourage entrepreneurship is a logical next step. Moreover, we need a better understanding of how taxation and regulation affect the decisions of entrepreneurs, especially as policymakers and think tanks work to design institutions that increase state-level economic performance (e.g., Laffer and Moore 2007). To reiterate, these questions will not be satisfactorily

addressed until better measures of entrepreneurial endeavors are developed. As the centrality of entrepreneurship to economic growth becomes increasingly established, we will need to develop broader and more nuanced measures to understand the conditions that enable entrepreneurship to thrive.

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Table 1. Summary Statistics (N=850)

Variable	Mean	Std Dev	Min	Max
Economic growth (%)	1.19	2.57	-16.38	17.81
Self-employment (%)	14.31	2.50	8.89	22.38
Venture capital funding (\$)	15.29	24.11	0	218.47
Self-employment lag (%)	12.57	2.13	8.38	19.76
Venture capital funding lag (\$) (N=800)	6.04	14.76	0	124.24
Bankruptcy exemption (thousands)	89.24	97.43	10.50	315.33
Religious (%)	52.03	11.94	27.16	77.79
Total tax burden (%)	30.27	1.68	26.00	36.00
College degree (%)	19.07	3.98	10.40	30.80
Real per capita income (thousands)	20.89	34.31	13.27	32.42
Population (millions)	4.97	5.35	.42	32.49
Population growth (%)	1.08	1.22	-3.83	8.44

Table 2. Average Bankruptcy Exemptions in the U.S. States, 1980-1996

State	Exemption	State	Exemption
Alabama	21,501.25	Montana	104,666.20
Alaska	60,394.74	Nebraska	22,842.10
Arizona	90,714.09	Nevada	122,397.60
Arkansas	283,636.80*	New Hampshire	33,591.48
California	77,055.03	New Jersey	27,763.31
Colorado	61,355.67	New Mexico	74,252.11
Connecticut	58,043.35	New York	32,302.27
Delaware	14,972.58	North Carolina	25,253.61
Florida	284,692.20*	North Dakota	223,327.90
Georgia	17,156.20	Ohio	17,201.00
Hawaii	69,879.06	Oklahoma	287,594.90*
Idaho	73,023.10	Oregon	34,053.95
Illinois	26,896.59	Pennsylvania	27,763.31
Indiana	25,980.57	Rhode Island	27,763.31
Iowa	284,469.90*	South Carolina	17,313.06
Kansas	315,326.60*	South Dakota	285,736.10*
Kentucky	22,845.08	Tennessee	20,829.33
Louisiana	53,970.49	Texas	311,845.40*
Maine	29,233.36	Utah	19,283.99
Maryland	16,376.83	Vermont	96,036.74
Massachusetts	113,550.80	Virginia	15,686.50
Michigan	27,763.31	Washington	75,657.26
Minnesota	270,875.30*	West Virginia	25,528.26
Mississippi	135,538.70	Wisconsin	51,979.62
Missouri	16,799.93	Wyoming	29,019.97

Note: * indicates an unlimited homestead exemption state for some of the time period. Some states have identical means for total exemption levels because they use the federal amounts. This data is from Hynes, Malani, and Posner (2004).

Table 3. Determinants of Economic Growth and Unemployment in the U.S. States, 1980-1996

Variable	Growth as Dep. Var.	Growth as Dep. Var.	Unemployment as Dep. Var.	Unemployment as Dep. Var.
Self-employment lag (%)	.25* (.13)	---	-.40*** (.12)	---
Venture capital funding lag (\$)	---	.0082* (.005)	---	.0056 (.0038)
Total tax burden (%)	-.42*** (.14)	-.20* (.12)	.068 (.094)	.082 (.11)
Real per capita income (thousands)	.54*** (.19)	.49*** (.15)	-.42*** (.09)	-.35*** (.12)
Population (millions)	.073 (.10)	.027 (.072)	.066 (.08)	.075 (.11)
Population growth (%)	.85*** (.11)	.79*** (.13)	-.76*** (.14)	-.70*** (.17)
College degree (%)	-.89*** (.17)	-.92*** (.15)	.70*** (.16)	.71*** (.21)
Religious (%)	.028 (.039)	.056 (.052)	.030 (.027)	.036 (.034)
R ²	.64	.59	.84	.84
N	850	800	850	800

Note: OLS regressions with state and year fixed effects and standard errors adjusted for clustering within state.

* $p < .10$, ** $p < .05$, *** $p < .01$.

Table 4. The Determinants of Self-Employment in the U.S. States, 1980-1996, All States

Variable	Model 1	Model 2	Model 3
Bankruptcy exemption (thousands)	.0034 (.0038)	.0063 (.0072)	.028** (.012)
Exemption squared	--	-.000012 (.000020)	-.00020** (.000095)
Exemption cubed	--	--	-.00000042** (.00000020)
Total tax burden (%)	-.080 (.10)	-.082 (.10)	-.086 (.10)
Real per capita income (thousands)	-.24* (.14)	-.22 (.14)	-.20 (.14)
Population (millions)	.026 (.25)	.030 (.25)	.024 (.25)
Population growth (%)	-.31*** (.10)	-.31*** (.10)	-.31*** (.10)
College degree (%)	.40** (.19)	.39** (.19)	.37* (.19)
Religious (%)	-.0059 (.031)	-.0056 (.031)	-.0035 (.031)
Bankruptcy exemption statistically significant?	No	No	Yes*
R ²	.92	.92	.93

Note: OLS regressions with state and year fixed effects and standard errors adjusted for clustering within state. N=850 in all specifications. * $p < .10$, ** $p < .05$, *** $p < .01$.

Table 5. The Determinants of Venture Capital Funding in the U.S. States, 1980-1996, All States

Variable	Model 1	Model 2	Model 3
Bankruptcy exemption (thousands)	-.077 (.046)	-.20*** (.065)	.25 (.017)
Exemption squared	--	.00052*** (.00016)	-.00088 (.0017)
Exemption cubed	--	--	-.00000082 (.0000036)
Total tax burden (%)	-.90 (.80)	-.78 (.79)	-.78 (.79)
Real per capita income (thousands)	.20 (.14)	.17 (.14)	.16 (.15)
Population (millions)	4.50*** (.81)	4.34*** (.77)	4.35*** (.77)
Population growth (%)	.40 (1.17)	.28 (.12)	.29 (1.18)
College degree (%)	4.14*** (1.49)	4.49*** (1.52)	4.52*** (1.52)
Religious (%)	-.080 (.035)	-.093 (.036)	-.097 (.035)
Bankruptcy exemption jointly statistically significant?	No	Yes**	Yes**
R ²	.73	.73	.73

Note: OLS regressions with state and year fixed effects and standard errors adjusted for clustering within state. N=850 in all specifications. * $p < .10$, ** $p < .05$, *** $p < .01$.