The Impact of Consumer Credit Access on Employment, Earnings and Entrepreneurship*

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Abstract

How does consumer credit access impact job flows, earnings, and entrepreneurship? To answer this question, we build a new administrative dataset which links individual employment and entrepreneur tax records to TransUnion credit reports, and we exploit the discrete increase in consumer credit access following bankruptcy flag removal. After flag removal, individuals flow into self employment. New entrants earn more, borrow significantly using unsecured and secured consumer credit, and are more likely to become an employer business. We show that after bankruptcy flags are removed, individuals who own an employer firm borrow on average $40k more after flag removal, a 33% gain relative to the sample average. In the formal sector, after flag removal, non-employed and self-employed individuals are more likely to find unemployment-insured "formal" jobs at larger firms that pay greater wages.

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While much is known theoretically and empirically about the interaction between credit constraints and startup rates (*inter alia* Cooley and Quadrini [2001], Hurst and Lusardi [2004], Buera, Kaboski, and Shin [2009], Hurst and Pugsley [2011]), little is known about the way access to consumer credit affects individual job flows, startup decisions, or subsequent earnings.[1] How does consumer credit access affect the transition rate into and out of employment and self employment? What are the consequences of these transitions for labor earnings and business income?

We begin our analysis by documenting meaningful comovements of available personal credit with self and formal employment flows, as well as small firm ownership for a large random sample of 3 million prime-age individuals. In our sample of 3 million prime-age individuals, we show that self employment is a monotone increasing function of available personal credit, which contrasts with prior studies, such as Hurst and Lusardi [2004], who find that self employment is a largely flat function of wealth. In addition, we also show that small firm ownership sharply increases with owner's personal credit. Our initial findings for this broad sample of individuals are in agreement with Robb and Robinson [2012] who find that many startups receive debt financing through the personal balance sheets of the entrepreneur and that borrowers in states with higher personal bankruptcy exemptions, and thus implicitly less credit available, obtain a lower about of debt to personal capital.

However, the central issue with determining the causal impact of personal credit on job and startup outcomes is that personal credit is highly correlated with an individual's quality as well as their wealth and access to funds. Thus, it is hard to separate out wealth effects and fundamental ability from access to credit. Our approach to this question is to examine individuals after bankruptcy flags are removed from consumer credit reports, similar to Musto [2004]. These removals occur, by law, no more than ten years after bankruptcy and give rise to large increases in credit ratings, while not reflecting large changes in an individual's credit worthiness.

[1]The topic of startups and access to consumer credit has received much attention following the housing bust (*inter alia* Fairlie and Krashinsky [2012], Chatterji and Seamans [2012], Schmalz, Sraer, and Thesmar [2013], Adelino, Schoar, and Severino [2013], Jensen, Leth-Petersen, and Nanda [2014], Kerr, Kerr, and Nanda [2014] as well as Greenstone, Mas, and Nguyen [2014] for bank credit), however, only recently have studies emerged which assess the impact of consumer credit on job flows and unemployment quantitatively, e.g. Athreya and Simpson [2006], Karahan and Rhee [2011], Midrigan and Philippon [2011], Chen [2012], Carroll, Slacalek, and Sommer [2012] , Chen, Corbae, and Glover [2013], Glover and Corbae [2015], and Glover and Corbae [2017], Herkenhoff [2013], Schott [2013], Kehoe, Midrigan, and Pastorino [2014] as well as empirically, e.g. Mian and Sufi [2012], Bethune [2015], Mehrotra and Sergeyev [2015], Herkenhoff, Phillips, and Cohen-Cole [2015].

We use a difference-in-difference approach in which we compare cohorts of bankrupt individuals whose flags are removed to adjacent cohorts of bankrupt individuals whose flags are not yet removed. We apply this methodology to a new dataset which merges millions of credit histories and self-employment tax records to administrative US Census employment records. We show that consistent with prior studies such as Musto [2004] and Han and Li [2011], access to credit increases dramatically among the subgroup of individuals who have their bankruptcy flags removed. We show that these increases in credit access affect an individual's employment outcomes and the likelihood of starting an employer firm. We then verify our results in the Survey of Consumer Finances (SCF), a public cross-sectional survey.[2]

We frame the subsequent discussion in terms of two competing economic forces generated by a bankruptcy flag removal: (i) the *credit-access* effect: credit constraints loosen after flag removal allowing individuals to start self-employed businesses or borrow to smooth consumption while searching for an unemployment-insured (UI) job (we refer to UI jobs as formal sector jobs, and non-UI jobs such as self employment as informal sector jobs) (ii) the *credit-check* effect: individuals who were non-employed or self-employed subsequently find jobs in the formal sector after flag removal. Our main contribution is to provide suggestive evidence of these two economic forces as well as provide a complete picture of how the discrete rise in consumer credit following bankruptcy flag removal affects job flows, the transition rate from non-employer to employer businesses, and earnings. Our approach is to build a set of facts that when viewed together, provide consistent evidence that the credit-access and credit-check effects influence employment outcomes.

We first study self employment, and we show that the self-employment rate does not change among individuals whose bankruptcy flag is removed versus those whose flag is not removed. However, the lack of movement in the self-employment rate masks offsetting movements in gross flows. Relative to the control group whose flags are not removed, those whose flags are removed have both gross flows into self employment increase by .16% per annum and gross flows out of self employment increase by about .17% per annum. As a result, these flows offset and the stock remains constant.

Examining individuals who transition into self employment, we show that cohorts who transition into self employment after a bankruptcy flag removal borrow $15k more than cohorts who transition into self employment prior to flag removal. This represents a 12.4%

[2]See online appendix L for SCF comparison.

increase in borrowing relative to the sample average.[3] They borrow mainly in the form of mortgages, HELOCs and credit cards, and they earn ∼$1k more Schedule C net income at any time horizon we observe (an increase of about 4% relative to the sample average).[4] They are also more likely to enter capital intensive industries such as manufacturing and industries with high external finance needs.

We then use the new Integrated Longitudinal Business Database (LBD) which covers small and large firm ownership to measure transitions from self employment to employer firms. We believe focusing on this conditional sample of self-employed individuals examines people who are closer to the active margin of having demand for credit shows how extra credit affects the tendency to start a new firm and hire employees. Those individuals who enter self employment after bankruptcy flag removal are .7% more likely to own an employer firm in the LBD compared to those who enter self employment before bankruptcy flag removal. This represents a 200% increase over the sample average LBD firm ownership rate. Among those who own an employer firm in the LBD, they borrow on average $40k more after flag drop, a 33% gain relative to the sample average. These lsst facts are economically large and new.

We then examine formal sector job flows (i.e. flows into and out of jobs that are unemployment-insured (UI)) which we use to measure the credit-check effect. We find that the formal-sector employment rate of individuals whose bankruptcy flags are removed increases by .32% relative to those whose flags remain on their record. Measured relative to the control group, gross flows into the formal sector increase by .24% per annum. While average earnings of formally employed workers remains constant around flag removal, we find that those who make the transition into formal employment following a bankruptcy flag removal earn $1.8k more per annum relative to individuals who transition into formal sector employment prior to flag removal. This earnings gain represents an increase of over 4.3% relative to the sample average. What is striking is that conditional on flowing into the formal sector after flag removal, individuals are 1.5% more likely to work for large firms (1000+ employees) and less likely to subsequently exit the formal sector to non-employment or self-employment. In other words, those who get jobs after the flag removal are not 'bad' workers.

[3]The average total balance across all forms of credit one year prior to removal is $121k in our sample.

[4]Relative to national averages, this is still a 2.2% treatment effect. The median self employment income is $45,000 and calculated as the pooled average of all heads of household who have positive self employment income from the 1998 SCF through the 2010 SCF, weighted.

While evidence on firm size and credit checks is scarce, Society for Human Resource Management [2012b] report that 45% of large firms (2,500 to 24,999 employees) conduct credit checks versus 25% of small firms (100 to 499 employees).[5] The fact that workers disproportionately flow into larger firms following flag removal provides one piece of suggestive evidence that credit-checks may have previously prevented these individuals from obtaining jobs at those firms.

One potential criticism of inferring the credit-check effect from the employer size result is that it is also consistent with individuals using consumer credit to smooth consumption while searching for higher paying jobs at larger and more productive firms. In particular, recent work by Herkenhoff, Phillips, and Cohen-Cole [2015] shows that *displaced workers* borrow and take longer to find a job if they have more credit access. In the current sample, which includes few displaced workers, those who find a new formal job do *not* increase borrowing. This lack of borrowing for our non-displaced workers rules out the explanation that workers are using increased credit to search for a new job at larger firms that pay greater wages.

As Chen, Corbae, and Glover [2013] discuss, 60% of employers conduct credit checks and the main reason they do so is to reduce theft. Furthermore, Society for Human Resource Management [2012b] report that among employers who conduct credit checks, 91% of the time they do so for "job candidates for positions with fiduciary and financial responsibility (e.g., handling cash, banking, accounting, compliance, technology)." As an additional test of the credit-check hypothesis, we further stratify job flows by industry, and we show that workers are more likely to find jobs in the retail and service sectors, which disproportionately involve handling payments and the use of cash registers, after bankruptcy flag removal. We find weaker effects in sectors such as transport/communications and manufacturing, which are less likely to involve jobs which require handling payments.

Since we do not directly observe credit checks, our findings can only be viewed as suggestive evidence that credit checks limit job opportunities for bankrupt workers. But, at the bare minimum, we take our results – (a) increased flow rates into formal employment, (b) increased flow rates into large employers, (c) increased flow rates into jobs that involve handling of cash payments, (d) lack of borrowing by job finders – as evidence that is broadly consistent with concurrent and independent regional studies by Shoag and Clifford [2016]

[5]They do not report other size intervals. In terms of background checks, existing evidence from the UK (e.g. Zibarras and Woods [2010]) and US (e.g. Society for Human Resource Management [2012a]) indicates that small firms are much less likely to conduct background checks.

and Cortes, Glover, and Tasci [2016] which have demonstrated that credit checks may limit employment opportunities for certain subgroups of individuals.

Our paper contributes to several literatures, including the theoretical and empirical literature on credit constraints and startup rates, cited on the first page of the introduction. Of particular note is the concurrent, independent, and innovative work by Bos, Breza, and Liberman [2015] and Dobbie, Goldsmith-Pinkham, Mahoney, and Song [2016]. Bos et al. [2015] focus on the way delinquencies, i.e. skipped payments as opposed to debt discharge, affect earnings and self employment in Sweden. Bos et al. [2015] show that individuals whose past defaults are publicly available for longer are less likely to have a job, are more likely to be self-employed and earn lower incomes on average. They do not focus on transitions into and out of self and formal employment. We have also have direct evidence of different types of borrowing and the transitions into new employee businesses.

Dobbie et al. [2016] merge bankruptcy court records with SSA administrative earnings and study the impact of bankruptcy flag removal on the stock of formal employment and self employment as well as earnings. Dobbie et al. [2016] find insignificant impacts of flag removal across most of their specifications, but, where our papers overlap, our point estimates fall within their confidence intervals. One key advantage of our dataset is that we observe credit bureau records, and so we have little measurement error because we see the actual date bankruptcy flags are removed from credit reports, whereas Dobbie et al. [2016] must infer removal of bankruptcy flags from court filing records and there are sometimes leads and lags in the flag removals. Most importantly, they are not able to examine the types of firms workers join nor the impact on hiring the first employees by previous non-employee firms.

Our largest important contribution is to go beyond previous research and examine early entrepreneurial firms from the integrated longitudinal business database to show where consumer credit has the largest impact. Many of the measured impacts for formal employment are small, but we show that there is a large impact on small entrepreneurial firms as we show that transitions from non-employer to employer businesses increases sharply - a new result that has not been examined anywhere previously to our knowledge.

We also show there is large increase in borrowing by the owners of these firms that occurs in the year of hiring their first employee. We thus are the first, to our knowledge, to measure the causal impact of consumer credit access, inclusive of both unsecured and mortgage credit, on the rate at which individuals move from being a non-employer to employer business - hiring

their first formal employee and the amount owners of new-employer firms borrow. We thus add to the work of Robb and Robinson [2012] who documents that small entrepreneurial firms borrow from banks as we show they also borrow using there own personal credit.

We also provide the most complete characterization of the consumer-credit choices of these new entrants given we are the first to merge credit reports with LBD firm ownership records. We believe this new evidence to be an advance over survey data which often aggregates or does not measure all sources of consumer credit, e.g. Census CBO/SBO and SCF – an exception is Robb and Robinson [2012] who conducted a detailed survey of business financing sources.

Overall, we build on the recent literature which studies bankruptcy institutions and labor supply (e.g. Livshits, MacGee, and Tertilt [2007], Han and Li [2007], Chen [2012], Chatterjee and Gordon [2012], Herkenhoff and Ohanian [2012], Dobbie and Song [2013], Athreya et al. [2014]) as well as the impact of credit information structures on employment (Chatterjee, Corbae, and Rıos-Rull [2008], Athreya, Tam, and Young [2012], Chen et al. [2013], Glover and Corbae [2015], and Glover and Corbae [2017]). In particular, Chen et al. [2013] and Glover and Corbae [2017]develop a model in which credit scores reveal information about the productivity of a worker, leading employers to discriminate based on credit scores. Our empirical findings are consistent with this mechanism.

The paper proceeds as follows. Section 1 summarizes the data. Section 2 discusses the population relationships between credit, self employment and formal employment. Section 3 describes the institutional background for the bankruptcy flag removal experiments. Section 4 presents the baseline 'stock' or 'level' results. Section 5 analyzes self-employed transitioners and LBD firm owners, and Section 6 analyzes those who obtain a job in the formal sector. Section 7 concludes.

1 Data Description and Empirical Approach

Our data on unemployment-insured (UI) jobs (or formal sector jobs) comes from the Longitudinal-Employer Household Dynamics (LEHD) database. The LEHD, which is a matched employer-employee dataset that covers 95% of U.S. private sector jobs, includes information on worker flows between UI jobs as well as quarterly earnings.[6] Our employment and earnings data

[6]See Abowd et al. [2009] for an extensive description of the LEHD.

span from 1995 (or 1998 in some cases) to 2008 for 11 states: California, Maryland, Illinois, Texas, Indiana, Nevada, New Jersey, Oregon, Rhode Island, Virginia, and Washington.

Our self-employment and firm-ownership measures are derived from the Integrated Longitudinal Business Database (ILBD). This database integrates self-employment records (identified by a unique scrambled version of their social security number) with the employer-firms that are subsequently created and owned by the same individuals. We use the non-employer/employer links built in the path-breaking work of Davis et al. [2007], but, for the sake of self-containment, in online appendix A we briefly describe the way the non-employer/employer universes were linked. The self-employment income comes from the universe of Schedule C tax records for sole-proprietors across all U.S. states. We therefore have net self-employment income annually from 1998-2010, as well as indicators of whether or not the self-employed individual began employing others.

All consumer credit information is taken from TransUnion at an annual frequency from 2001 to 2010. TransUnion is one of the three largest credit scoring companies in the United States, and it has a similar market share to Equifax and Experian. Our main sample is an approximately 5% random sample of individuals with credit reports from the 11 states for which we have LEHD data. The TransUnion data is then merged based on an anonymized unique identifier to the LEHD. Our data includes information on the balance, limit, and status (delinquent, current, etc.) of different classes of accounts held by individuals.[7]

Each database contains the same anonymized unique identifiers that can be used to link the datasets together. Our resulting panel is unbalanced and contains earnings (1998-2008), self-employment income (1998-2010), and credit reports (2001-2010) at an annual frequency.

1.1 Variable Definitions

All nominal variables such as labor earnings, credit balance, and self-employed net income are deflated by the CPI (expressed in 2008 dollars), and we winsorize the top 1% of each

[7]Our credit data is measured as of September in each year, so there are instances in which flags are removed in October, November, or December of the prior year (i.e. prior fiscal year ending Dec. 31 through which we measure earnings and self-employment earnings), but the flag removal is classified as a removal only in the following year. In online appendix K, we attempt to capture these early transitions by using beginning-of-year employment (e.g. if an individual earned $1k last year and $1k this year, then they were employed at the beginning of the year, and they transited at some point in the prior year). Under these alternate beginning-of-year definitions of employment and self employment, our main results persist.

continuous variable, except variables pertaining to the LBD (since fewer than 1% of our sample has admissible values).

We define an individual to be self-employed in a given year if they earn at least $1k of real Schedule C net income throughout the year, and we define an individual to be formally employed if they earn at least $1k of real labor earnings throughout the year in an unemployment-insured job. Transitions are defined at an annual frequency, e.g. an individual is counted as transitioning into self employment if they earn less than $1k of real Schedule C net income in the prior year and then earn at least that much in the current year.

An individual is counted as owning a firm in the LBD if their social security number or any other comparable identifier is linked to the ownership of an LBD firm.[8] We define two measures of LBD firm ownership, the first of which only requires one year of ownership and includes potentially transitory businesses. Our second definition is more stringent and requires at least two years of ownership.

A new job accession occurs if the individual begins working at an employer that they previously have not worked for in our sample period.[9] Individuals may have multiple job accessions in a given year, and some job accessions may not necessary result in a separation from a prior employer (in the case of holding two jobs). Employer measures of size are taken as the monthly average of 4th quarter employment.

Rather than using a traditional credit risk score, we use the TransUnion bankruptcy score which is designed to be a measure of bankruptcy propensity. The bankruptcy score lies between 0 and 1000 and higher scores reveal lower odds of bankruptcy. Bankruptcy scores are used only by more sophisticated lenders, and when they are used, they are used in conjunction with a traditional credit risk score. The Revolving Balance variable includes any type of credit that can be rolled over at a preset interest rate (this includes bankcards, revolving personal finance loans, and other revolving lines of credit). The combined sum of Home Equity Lines of Credit (HELOCs) are included in the HELOC Balance variable. Traditional unsecured credit cards that are issued by banks are included in the Bankcard

[8]Links are made to firmids, which refer to firms, not establishments. See online appendix A and Davis et al. [2007] for more details on the links. The 1+ years ownership equals one if the individual has a valid 'firmid' in that year. The 2+ years ownership equal one if the individual has a valid 'firmid' for at least two years in a row.

[9]We use an end-of-quarter accession definition (Abowd et al. [2009]) that requires the individual to earn at least $500 dollars from the new employer in two consecutive quarters.

Balance variable.

2 Population Relations Between Credit Constraints, Employment, and Self Employment

In this section, we assess the relation between credit constraints, self employment, and formal employment in the full TransUnion-LEHD sample (we will refer to this as the 'population' or the '100% Sample'). We impose minimal restrictions on the data. The sample includes prime age individuals aged 24 to 65 between 2002 and 2007 who earned at least 1k of self-employment or labor earnings in any year in the sample window. Our restrictions generate 16.4 million person-year observations and roughly 3 million individuals.

Table 1 presents data that shows that the mean prior-year bankruptcy score (which we will refer to as the 'credit score') is 414, and on average, self-employed individuals in our sample earned 29.3k per annum. Those who work in the formal employment sector earned 40.2k per annum. The self-employment rate is 11.1% and the transition rate into self employment is 3.7% per annum. The transition rate out of self employment is 3.1% per annum. Very few individuals own a firm with an employee, and even less own a firm that survives for 2 or more years. Roughly 79.4% of our sample are employed in the formal sector, 6.0% are simultaneously self-employed, and 15.6% are non-employed.

In Table 2, we regress outcome variables such as self employment and formal employment on deciles of unused revolving credit, controlling for the marginal cost of funds as proxied by the credit score, as well as other forms of available credit. We focus on revolving credit since the borrowing limit is well defined; however, in Appendix B, we include the coefficients on all types of credit, as well as the credit score. Let i index individuals, t index years, and j index pooled deciles of unused revolving credit. We estimate regressions of the following form, which include fixed effects (α_i), year dummies (γ_t), and dynamic controls ($X_{i,t}$):

$$Y_{i,t+1} = \alpha_i + \gamma_t + \sum_{j=2}^{10} \beta_j I(Unused\ Credit_{i,t}\ in\ Decile\ j) + \Gamma X_{i,t} + \epsilon_{i,t}$$

These regressions are designed to capture the correlation between the current stock of credit (measured at date t) and future labor market outcomes (measured at date $t+1$). Our

regressions include credit scores as a control for the marginal cost of credit, unused mortgage credit, to proxy for available housing wealth, as well as the unused balance of all other non-revolving and non-mortgage forms of credit. Furthermore, we include rolling deciles of cumulative lagged earnings as controls. This cumulative lagged earnings control is designed to proxy for all other forms of accumulated wealth other than through home equity. Our remaining dynamic controls include quadratics in both age and tenure. In all specifications, we include individual fixed effects to capture non-dynamic heterogeneity.

Column (1) of Table 2 demonstrates that the stock of self-employed individuals, measured in year $t+1$, rises as available credit increases, measured in year t. Moreover, this relationship is monotone. The first two deciles of unused revolving credit correspond to \$0 of available credit, while the third decile in Table 2 corresponds to \$100 dollars in unused revolving credit and the 9th decile corresponds to \$32k in unused revolving credit.[10] Figure 1 plots the coefficients on the unused revolving credit deciles in Table 2. In contrast to Hurst and Lusardi [2004], who find largely flat business ownership rates as a function of wealth with a pronounced rise only among the very wealthy, in our sample self employment is increasing across all deciles of credit access. Columns (2) and (3) show that the transition rate into self employment rises with available credit, and the transition rate out of self employment is not impacted. Columns (4) and (5) illustrate a positive relationship between LBD firm ownership, which indicates that the individual hired an employee, and the stock of available credit. Similar to the non-linear relationship between wealth and business ownership in Hurst and Lusardi [2004], the largest impact of credit on ownership of LBD firms is in the last decile of credit.

Figure 2 plots the coefficients for the relationship between LBD firm ownership and available credit. Moving from the third decile to the 10th decile of available credit corresponds to an increase in LBD firm ownership of .06 percentage points, which is a 10% increase relative to the sample average. In Column (6), we show that as self employment rises, formal employment falls, as expected. Due to space constraints, we include additional analysis in Appendix Table A1, including the full set of coefficients on the controls for the other stocks of credit (which are present in each regression but suppressed due to space constraints), as well as the coefficients on credit scores, our proxy for the marginal cost of funds.

These regressions suggest that consumer credit, self employment, and formal employment

[10]Mean unused credit by Decile: Decile 1 \$0; Decile 2 \$0; Decile 3 \$100.8; Decile 4 \$492.0; Decile 5 \$1,537; Decile 6 \$3,788; Decile 7 \$8,085; Decile 8 \$16,083; Decile 9 \$32,362; Decile 10 \$65,904.

comove in meaningful ways. However, these regressions are not causal as access to credit is likely correlated with underlying worker characteristics which are time-varying and unobserved. One example includes the stock of wealth. We use a number of proxies to control for wealth, but we are unable to directly observe it. We therefore turn to a natural experiment, bankruptcy flag removal, in order to isolate the causal impact of consumer credit access on both formal and self employment, and the impact on the borrowing of owners of employer-firms.

3 Bankruptcy Institutional Background

Our discussion of the bankruptcy institutions in the United States is abbreviated and based largely on the discussion by Han and Li [2007], Li and White [2009], and Han and Li [2011]. There are two main types of bankruptcy filings in the United States, Chapter 7 (liquidation) and Chapter 13 (repayment plan), however we are unable to differentiate between the two in our dataset. As Han and Li [2007] discuss, more than 70% of bankruptcy filings in the US are Chapter 7 filings, and of those filings that initially begin as Chapter 13 filings, many are subsequently converted into Chapter 7 filings.[11] As Han and Li [2011] explain, the Fair Credit Reporting Act (FCRA) and the original Bankruptcy Code itself largely govern how bankruptcy filings appear on a credit report. Chapter 7 bankruptcy information is removed up to 10 years after the date of filing, whereas Chapter 13 is removed up to 7 years after filing.[12] What is important for the purpose of our regression design is that the removal of the bankruptcy flag follows a cutoff rule. One key advantage of our dataset is that we observe credit bureau records, and so we have little measurement error in the date bankruptcy flags are removed from credit reports, as there are sometimes leads and lags in the flag removals,

[11] In short, Chapter 7 involves the liquidation of an individual's assets and the discharge of certain debts (student debt for instance cannot be discharged, and home equity is often protected up to a state-specific limit, and so we include individual fixed effects to absorb this variation), whereas Chapter 13 is essentially a repayment plan and it allows individuals to repay all or part of their debts. See Li and White [2009] for discussion of the way repayments are used strategically to save one's home.

[12] Quoting from Han and Li [2011]: "The FCRA states: '605 (a) Information excluded from consumer reports. (1) Cases under title 11 [United States Code] or under the Bankruptcy Act that, from the date of entry of the order for relief or the date of adjudication, as the case may be, antedate the report by more than 10 years'; and '(5) Any other adverse item of information, other than records of convictions of crimes which antedates the report by more than seven years.' The FCRA has no rule on the minimum period of time that credit bureaus have to report a bankruptcy filing. Indeed, it is common that credit bureaus remove a Chapter 13 bankruptcy record from a credit report after only seven years. Also, the Act has no time restrictions on using the bankruptcy record that is maintained in the creditors proprietary database."

given some differences in court bureaucracies, reporting of filings and the conversions of Chapter 13 into Chapter 7.

3.1 Empirical Approach

Our empirical strategy is to compare previously bankrupt individuals before and after their bankruptcy flag removal to a subset of individuals whose flags are removed later in the sample, i.e. we implement a difference-in-difference analysis.[13] In particular, our sample window is 2001-2007[14] and we always restrict our attention to 24-65 year olds.[15] Even though our sample window stops in 2007, our credit data allows us to identify flag removals between 2002 and 2010. We include all flag removal cohorts in our analysis.

Let i index individuals and t index years (from 2001 to 2007). Let α_i denote a set of individual fixed effects, and γ_t denote year dummies. Let $Y_{i,t}$ denote the outcome of interest (a self employment dummy, earnings, wages, etc.). Let $D_{x,i,t}$ be a dummy variable taking the value 1 when an individual is x periods before (if x is negative) or after (if x is positive) flag removal. E.g. $D_{-2,i,t}$ is a dummy indicating if an individual is 2 periods before flag removal, likewise $D_{0,i,t}$ takes a value of 1 if the individual is in the year of flag removal, and $D_{1+,i,t}$ takes a value of 1 if the treated individual is 1 or more years past flag removal. The specifications we use are of the following form:

$$Y_{i,t} = \alpha_i + \gamma_t + \beta_{-2}D_{-2,i,t} + \beta_{-1}D_{-1,i,t} + \beta_0 D_{0,i,t} + \beta_{1+}D_{1+,i,t} + \Gamma X_{i,t} + \epsilon_{i,t} \tag{1}$$

The objects of interest are β_0 and β_{1+} which summarize the impact of flag removal on the outcome variable in the year of removal as well as subsequent years, respectively. To check whether our point estimates are valid, we show that the treatment and control group have

[13] The presence of fixed effects and the unbalanced panel imply that there are cohorts which do not have their flags removed in our sample window. These individuals are in the control group. The fixed effect includes the control group dummy. The treatment group include those with flags removed. The fixed effect for these individuals includes the treatment group dummy. The treatment dummy is interacted with post-flag removal using $D_{x,i,t}$.

[14] Since we use several forward lags of variables, we cannot include 2008 in our sample window. However, our 2007 variables that are forward looking are using 2008 data.

[15] We do note that while our time period includes individuals whose flags are removed before and after the bankruptcy reform act of 2005, our research design is unaffected since everyone in our sample previously filed bankruptcy before 2005. In online appendix K we limit the sample window to 2001-2005, and we use alternate variable definitions. See Albanesi and Nosal [2015] for more analysis of the how the reform affected new delinquency behavior.

parallel trends prior to flag removal, (i.e. β_{-2} and β_{-1} are not statistically different from zero).

Our instrument exploits individual level variation in bankruptcy status, and thus we cluster our standard errors at the individual level. However, in appendix C, to alleviate any concerns over independence of observations at the cohort or geographic level, we cluster the standard errors at a higher level than the individual level (cohort by zip), and we show that our main results persist.

3.2 Summary Statistics Surrounding Bankruptcy Flag Removals

Table 3 compares the mean values of our main variables of interest one year before bankruptcy flag removal to one year after bankruptcy flag removal.[16] This section is designed to provide raw averages of important variables and summarize broad changes in those variables. In the sections that follow, we will address compositional issues by including fixed effects and dynamic controls in all regressions.

Panel (A) of Table 3 describes the main 'stock' (or 'level') variables. If we define formal and self employment based on a $1,000 dollar earnings threshold, Column (1) of Table 3 shows that 78.7% of individuals are formally employed and 9.0% of individuals are self employed one year before bankruptcy flag removal. Following flag removal, Column (2) shows that the formal employment rate decreases by .1% to 78.6%, whereas the self-employment rate increases by .6% to 9.6%. Column (4) shows that the change in self employment is significant at the 10% level while the change in formal employment is not.

Roughly 6.1% of individuals in our sample are simultaneously formally-employed and self-employed (SE), and roughly 18.4% of the individuals in our sample are non-employed. Following flag removal, the fraction who hold two jobs increases, whereas non-employment moves insignificantly.[17] Prior to flag removal, .4% of our sample own a firm in the LBD for

[16] The 2006 and 2007 flag removal cohorts are not in our sample one year after their flag removal, but they are still used as controls. Therefore, the two sample sizes differ by 60k, where 60k is the combined number of individuals in the 2006 and 2007 cohorts. Likewise, the 2009 cohort and 2010 cohorts (approximately 50k individuals) will never be in our sample one year before or after their flag removal. But they are still used as controls in the main tables. So while the total number of individuals in our sample frame is 220k, only 170k reach one year before flag removal, and only 110k reach one year after flag removal.

[17] We examine these individuals who have both self-employment and formal-employment income prior to flag removal separately in some tests, examining if they increase their self-employment income more following flag removal. However, given this set of individuals with both self- and formal-employment income and are

1+ years, whereas .2% of our sample own a firm in the LBD for 2+ years. Following flag removal, we see a significant increase in the latter definition of LBD firm ownership by .1%. In terms of employer characteristics, roughly 1/3 of our workers are employed at large firms with 500+ employees, and this fraction increases significantly following flag removal.

Panel (B) of Table 3 describes the main flow variables. Approximately 4.6% of individuals transit into formal employment in the year before flag removal, whereas 4.4% of individuals transit out of formal employment. In both instances, there is an insignificant change in flows following flag removal. Prior to flag removal, 3.1% of individuals transition into self employment whereas 2.8% transition out of self employment. In the year after flag removal, the transition rate into self employment increases by .3% per annum to 3.4%, which is significant at the 10% level.

Panel (C) of Table 3 describes the main earnings variables. Per capita labor income in the sample is $32,683. Following flag removal, real annual labor income increases by $300, and this is a significant change. If we adjust for the fact that some individuals are not working, annual labor earnings per worker is approximately $41,529 (=$32,683/.787). Per capita self-employment income is about $2,140 per annum. If we adjust for the fact that most individuals are not self-employed, annual self-employed net income per self-employed individual is $23,778 (=$2,140/.09). Following flag removal, self-employed net income per capita increases by $161. Real annual total income is the sum of both self employed (SE) net income and labor (non-SE) earnings.

Panel (D) of Table 3 describes the main credit variables. We see large credit balances prior to flag removal since the individuals have a partial recovery in credit access before their flag is removed (for more discussion, see Cohen-Cole et al. [2009]). Following flag removal, however, we see a large increase across all types of credit, especially mortgage credit (see Han and Li [2011] for more results on credit portfolios after flag removal).

bankrupt is relatively smaller, we do not find significantly different results relative to the full sample of firms. In addition, we examine the impact on younger workers whose flag is removed when they are 40 years old or less. Given a small set of such workers, because people who enter into bankruptcy are mostly older than 30, we do not find significant results for this subset of workers.

4 Level of Employment

We begin our analysis with what we will call the 'stock' (or 'level') results, meaning that we only consider the impact of bankruptcy flag removal on the levels of employment and self employment. In the subsequent section, we then turn to our main analysis of gross flows and examine the individual flow rates into and out of formal and self employment change after bankruptcy flag removal, and we further characterize subsequent borrowing, earnings gains, and transitions into LBD firm ownership.

Table 4 illustrates the baseline stock results. The coefficients in Table 4 correspond to $(\beta_{-2}, \beta_{-1}, \beta_0, \beta_{+1})$ in Equation 1, and throughout the paper we will estimate coefficients using OLS, and we cluster standard errors at the individual level. In all regressions, we include year fixed effects and individual fixed effects in order to correct for time trends, and compositional differences in state laws, industry, occupation, and any other static characteristics of the individual. We also include dynamic controls such as quadratics in age and tenure.

Table 4 illustrates a large spike in bankruptcy scores in Columns (1) and (2) following bankruptcy flag removal. This finding corroborates the prior work of Musto [2004] and Han and Li [2011], and is at the core of the credit access effect we study below. To visualize this change in bankruptcy scores, Figure 3 illustrates the regression coefficients from Column (1), showing the stable trend in bankruptcy scores leading up to the flag removal, followed by a punctuated one-time level shift in bankruptcy scores. Column (2) illustrates that after we take out a quadratic age trend, individuals' credit scores are close to pre-flag removal scores; however, this subsequent mean-reversion in scores is largely due to the increased borrowing following flag removal.

Columns (3) and (4) of Table 4 show the impact of flag removal on formal employment. Column (3) defines formal employment to be those who have earned at least \$1,000 in an unemployment-insured job, whereas Column (4) defines formal employment to be those who have earned at least \$5,000 in an unemployment-insured job. Using the \$1k threshold, Column (3) shows that the stock of formally employed individuals increases by .465% for those whose bankruptcy flags were removed relative to the control group who are 3 or more years before flag removal. Using the 5k definition in Column (3), formal employment increases by .323%. Ceteris paribus, if all bankruptcy flags in the US were eliminated from credit reports, our partial equilibrium estimates would imply that roughly 50,000 individuals

find formal sector jobs.[18] Columns (5) and (6) of Table 4 show the impact of flag removal on self employment, defined using $1k and $5k annual net income thresholds, respectively. Both columns reveal a small, but insignificant increase in self employment following bankruptcy flag removal.

In summary, the 'stock' or 'level' results indicate that while formal employment responds to flag removal, self employment is stagnant. However, this relatively stable stock of self employment masks offsetting changes in gross flows and as such leads to the potential mistaken conclusion that self employment does not respond to credit changes. As we will see in our main tests in Section 5, following flag removal, there is more churn and reallocation as flows into and out of self employment increase. Some individuals leave self employment for the formal sector and other individuals move into self employment.

5 Transitions Into and Out of Self Employment

In this section, we examine gross flows into and out of self employment and individuals borrowing patterns. We also use the ILBD to look beyond self employment and focus on the transition from non-employer to employer businesses. We examine transitioners earnings, borrowing behavior, and the subsequent rate at which non-employers become employer businesses in the LBD. By doing so, we attempt to disentangle the two competing forces following a bankruptcy flag removal: (i) the credit-access affect which allows previously constrained individuals to start a business, and the (ii) credit-check affect allows individuals who were previously unable to find a formal sector job due to poor credit to enter the formal labor force from self employment.

Table 5 measures self-employment flows following flag removal. Column (1) illustrates that flows into self employment, using the $1k threshold, increase by .16% per annum following a bankruptcy flag removal relative to individuals whose flag is not removed. This increase is quite transitory, and relatively small in economic magnitude. However, individuals who subsequently flow into self employment following bankruptcy flag removal, as we show below, borrow more, earn more net income, and are more likely to become an employer firm. We argue in the sections that follow, that the increased flow rate into self employment is due to

[18] Assuming 1 million individuals per year file, flags stay on for 10 years, and one half percent find jobs. In the online appendix D, we include additional results regarding non-employment, and we show that non-employment drops by over .5% following bankruptcy flag removal.

the credit-access effect. Column (2) shows that transitions out of self employment increase following bankruptcy flag removal as well. But, the table reveals a significant pretrend in the time series, which we address this in the next two columns.[19]

In the next two columns of Table 5, we use a $5k earnings threshold to define self employment. Column (3) illustrates that flows into self employment still increase by .1%; however, this coefficient is significant only at the 10% level. Column (4) of Table 5 shows that flows out of self employment still exhibit a weak pretrend, but the same general pattern emerges: individuals are exiting self employment following bankruptcy flag removal. In online appendix E, we include additional results which show that the rate at which individuals transition directly from self employment to formal employment increases by .12% after the flag drop. As we discuss in the following sections, the increased flow rate out of self employment following flag removal, and the subsequent flow into formal employment, is consistent with credit checks precluding bankrupt individuals from finding formal-sector jobs.

5.1 Earnings After Transitioning into Self Employment

To isolate the net income of new entrants, Table 6 reports the coefficients on the window of dummies surrounding the bankruptcy flag removal in Equation 1 interacted with a dummy of whether the individual transitioned into self employment. The non-interacted dummies around flag removal can be interpreted as the effect of flag removal on the incumbent self-employed's earnings, i.e. those who were previously self-employed before flag removal; those dummies reveal a slightly declining profile of earnings in each specification. How should the interaction terms be interpreted? Over and above the individual effects of transitioning into self employment and having a bankruptcy flag removed, the interaction terms capture the additional effect of having both events occur simultaneously. To meaningfully interpret the interaction terms, we compare those who transition into self employment 2 years before flag removal to those who transition into self employment 1 year after flag removal.

Column (1) is the easiest to interpret since all interaction terms and all coefficients are negative and monotone, meaning that formal sector employment earnings drop when individuals enter self employment following flag removal. This is intuitive since individuals have less time for a formal sector job if they are running their own business. Column (2)

[19] In online appendix K, we further address the pretrend issue with an alternate regression design that uses non-overlapping cohorts. The results are very similar.

illustrates that among individuals who transition into self employment, those who transition into self employment 1+ years after flag removal earn on average $991 (=(3376-158.2)-(2274-47.61)) more in Schedule C net income relative to those who transition into self employment 2 years prior to flag removal. Relative to the sample average self-employed net income of $23.8k (adjusting for 0s in Table 3), $991 represents a 4% gain. We arrive at this number by first computing the net income gain of an individual who transits into self employment 1+ years after flag removal. For such an individual 3 coefficients are non-zero and must be summed to obtain the overall effect of $11,739.8 (='1+ Years After Removal (d) x Trans. into Self-Employed, 1k (d)' + '1+ Years After Removal (d)' +'Transition into Self-Employed, 1k (d)' = 3376-158.2+8522). Repeating this exercise for those who transition 2 years before flag removal, the overall effect is $10,748.39 (=2274-47.61+8522). Taking the difference yields $991 (= $11,739.8-$10,748.39). Since the unconditional transition term ('Transition into Self-Employed, 1k (d)') cancels in these calculations, we omit it in the remainder of the paper. This combined difference of coefficients between the year after flag removal and two years before is the key statistic from the transition tables since it capture the impact of flag removal on transition outcomes. Therefore it is reported in the bottom two rows of every table along with its significance level.

Figure 4 plots the summed coefficients from Column (2) of Table 6. The points on the plotted line can be interpreted as the gain in Schedule C net income from entering self employment, relative to a non-transitioner in the control group (i.e. those who are 3 or more years prior to flag removal). In particular, we add the coefficients on the flag removal dummy (e.g. 2 Years Before Removal (d)), interaction term (e.g. 2 Years Before Removal (d) x Trans. Into Self-Employed, 1k (d)) and the transition term (e.g. Transition Into Self-Employed, 1k (d)), and we compute standard errors using the delta method. As the figure demonstrates, there is a stable trend for self-employed income prior to flag removal. Following flag removal, the net income gain for those who enter self employment increases rapidly. The difference in self-employed income for those who transition into self employment one or more years after removal vs. 2 years prior to removal is, as we saw before, $991. This calculation is illustrated on the graph.

Column (3) of Table 6 shows that among the individuals who transition into self employment, unconditionally they have incomes that are $7,016 greater, where total income is defined to be the sum of self-employed and formal labor earnings. However, among those who transition into self employment after flag removal, their total income actually declines

by $-670 (=(1667-761.7)-(1629-53.66)) relative to those who transition prior to flag removal. This indicates that the marginal self-employed entrant, while more profitable running a business, may not actually be benefiting from increased credit access since they must forgo their labor earnings.

We also examine those individuals who have both self-employment and formal-employment income prior to flag removal and examine if they increase their self-employment income more following flag removal. However, given this set of individuals are smaller, we do not find significantly different results. In addition, we examine the impact on younger workers whose flag is removed when they are 40 years old or less. Given a small set of such workers, -because people who enter into bankruptcy are mostly older than 30, we do not find significant results for this subset of workers.

5.2 Borrowing Among Those Who Transition into Self Employment

Table 7 illustrates the borrowing behavior of individuals who transition into self employment. Individuals who transit into self employment following a bankruptcy flag removal borrow heavily using secured credit (mortgages and HELOCs) as well as non-bankcard revolving credit. This provides a plausible mechanism for the increased earnings of individuals who transition into self employment following a bankruptcy flag removal – they simply have more capital to work with. We further test this hypothesis in Sections 5.3 and 5.4 by analyzing the external capital needs of the new entrants' industries and comparing borrowing of new entrants to other job transitioners.

Column (1) of Table 7 shows that individuals who transit into self employment, regardless of whether their flag is removed or not, borrow very little using their bankcards (note, 'bankcards' refers to traditional unsecured credit cards issued by banks). However, following flag removal, those who transition into self employment borrow significantly using revolving credit (e.g. revolving personal finance loans) as shown in Column (2). They also take out large amounts of mortgage credit as shown in Column (3) and HELOCs as shown in Column (4). Those who transition into self employment following a bankruptcy flag removal borrow $3,766 (=1253+3551-(277.8+759.8)) more using HELOCs relative to those who transition into self employment prior to flag removal. Turning to the total balance across all types of consumer credit, Column (5) shows that those who transition into self employment 1

or more years after flag removal borrow \$15,337 (=(16195+14373)-(6422+8809)) more than those who transition into self employment 2 years prior to flag removal.

There are two caveats that must be discussed. Table 7 exhibits a pretrend due to the fact that credit partially recovers before flag removal (e.g. see the discussion in Cohen-Cole et al. [2009]). However, we argue that a better gauge of ability to borrow is the credit score. The total amount which can be borrowed is proportional to the credit score and this exhibits a stable trend prior to flag removal (e.g. Figure 3) and a large discrete rise following flag removal. Furthermore, we formally test for sources of bias in every specification by including dummies prior flag removal; this allows readers to assess the parallel trends assumption throughout the paper. It is the exception that our regressions fail this assumption.

A second caveat is that our data does not specify the use of funds. While our point estimates imply that self-employed entrants borrow \$16k over and above others who have their flag removed, we do not directly observe whether these loans were used for the small business. However, our findings are consistent with direct survey questions on mortgage borrowing by entrepreneurs (e.g. see the discussion in Adelino et al. [2013]), as well as direct survey questions on credit card borrowing by small business owners (e.g. the Kaufman Survey studied by Robb and Robinson [2012]). We attempt to alleviate these concerns in several ways: (i) comparing entry across sectors, stratified by external finance dependence ratios, (ii) comparing the self-employed entrants to an alternate control, the formal sector entrants (who should not have a need for working-capital but realize similar earnings gains), and (iii) looking at subsequent business growth as a function of access to credit.

5.3 External Finance Dependence of Newly Self-Employed

To test the importance of credit access for new startups, online appendix J describes the industry, based on 1-digit SIC codes, in which individuals enter self employment after bankruptcy flag removal. Among new entrants to self employment, they are more likely to enter manufacturing, which is very capital intensive, as well as transport/communications, and retail. There is no differential impact of flag removal on services and finance startups, which are relatively less capital intensive and relatively less dependent on external finance than manufacturing or transport/communications startups. We take this as suggestive evidence that consumer credit is being used by the self employed in order to enter sectors with large external finance needs and greater capital intensity.

5.4 Importance of Credit for Newly Self-Employed vs. Other Job Transitioners

Are all job-transitioners more likely to borrow, simply because they have earnings gains, or do the newly self-employed rely particularly heavily on credit?[20] As another test of the importance of credit for the self-employed, Table 8 compares borrowing by those who transition into formal sector employment and those who transition into self employment. Both sets of individuals realize income gains, (recall, $991 for the new self-employed entrants after flag removal and $1,817 for the new formal-employed entrants after flag removal). However, Table 8 illustrates that those who transition into formal employment after flag removal borrow $4,526 relative to those who transition prior to flag removal; however, the interaction terms are negative, indicating that formal transitioners are just like everyone else, and if anything, they borrow less than non-transitioners (this is an important point that we will revisit shortly since it allows us to rule out consumption smoothing explanations for observed job finding patterns). In contrast, those who transition into self employment after flag removal borrow $15,337 more relative to those who transition prior to flag removal. So even though self-employed entrants have smaller earnings gains than new formal-employment entrants after flag removal, the self-employed borrow much more heavily following flag removal, nearly ∼10k more. This evidence is consistent with the credit-access effect being an important determinant of self employment.

5.5 Hiring the First Employee: LBD Firm Ownership

We further explore the importance of credit for job creation by looking at the impact of flag removal on business startups that employ at least one worker. In particular, Table 9 illustrates the impact of bankruptcy flag removal on whether or not the individual owns a firm in the Longitudinal Business Dynamics (LBD) database. Firms in the LBD database must have at least one employee. In Column (1), we define LBD firm ownership to be at least one or more years of firm ownership. This definition includes relatively transitory firm ownership spells of 1 year and less. We find that following flag removal, ownership of LBD firms increases, but insignificantly. In Column (2), we define LBD firm ownership to be at least two or more years of firm ownership. Column (2) illustrates that under this more

[20] We thank Nawid Siassi for suggesting this exercise.

stringent definition, there is now a significant and positive increase in ownership following bankruptcy flag removal, relative to the control group. The magnitude of this increase, however, is economically quite small; following flag removal, the odds that an individual owns a firm in the LBD increases by .05% (or approximately 1000 startups in our sample of 1.5m person-year observations). Figure 5 plots the results from Column (2), illustrating the rise in employer firms following flag removal.

5.6 Flows In and Out of LBD Firm Ownership

Are those who transition into self employment following flag removal 'marginal' entrepreneurs? Or are they subsequently growing and becoming LBD firm owners? The evidence in this section suggests that the post-flag removal self-employed entrants are more likely to make the transition into an employer-firm in the LBD. However, even though they have access to more capital, the odds that they subsequently exit self employment is stable and statistically indistinguishable from those who transition into self employment prior to flag removal.

Table 11 illustrates these results more formally. Column (1) of Table 11 shows the odds that a newly self-employed individual becomes the owner of an employer-firm in the LBD (under the 2+ years definition), and Column (2) of Table 11 illustrates the subsequent turnover rate among newly self-employed individuals. Column (1) shows that individuals are .7% (=(.00979+.000204)-(.00312-.0000893)) more likely to own a firm in the LBD if they transition into self employment 1+ years following a flag removal relative to those who transition into self employment 2 years prior to flag removal. Column (2) shows that newly self-employed individuals are transitioning out of self employment at a very high rate, 38%, unconditionally. However, following flag removal we see no disproportionate change in the subsequent rate at which these individuals exit self employment. This suggests that the marginal entrepreneur is not surviving any longer due to the additional access to capital market.

5.7 Borrowing by LBD Owners

Table 10 illustrates the borrowing behavior of LBD firm owners. Column (1) shows that they borrow moderate amounts of bankcard credit following flag removal. Column (2) shows that they increase revolving credit significantly following flag removal, and Column (3) illustrates

that they borrow significant amounts of mortgage credit. Column (3) shows that LBD firm owners who are 1 or more years after flag removal borrow $29,693 (=(37997+8462)-(7493+9273)) more using mortgage credit than LBD firm owners who are 2 years prior to flag removal. A significant fraction of their increased borrowing comes in the form of Home Equity Lines of Credit (HELOCs), as shown in Column (4). Turning to total debt balances (including secured and unsecured debts), Column (5) shows that LBD firm owners who are 1 or more years after flag removal borrow $39,835 (=(47332+14812)-(13318+8991)) more across all lines of credit than LBD firm owners who are 2 years prior to flag removal.

Figure 6 plots the summed coefficients from Column (5) of Table 10. The points on the plotted line can be interpreted as the increase in total credit balances among LBD firm owners, relative to non-owners in the control group (i.e. those who are 3 or more years before flag removal).[21] As the figure demonstrates, there is a stable trend in borrowing prior to flag removal. Following flag removal, relative borrowing among LBD firm owners increases rapidly. The difference in borrowing for those who are LBD firm owners one or more years after removal vs. 2 years prior to removal is $39,835 (=(47332+14812)-(13318+8991)).

Overall our findings are in agreement with Robb and Robinson [2012] who find that many startups receive debt financing through the personal balance sheets of the entrepreneur. By using credit reports and the removal of the bankruptcy flag, we are able to separate out entrepreneur quality from credit access and show that credit access is directly important.

5.8 LBD Pay and Employment

Finally, online appendix F illustrates the impact of bankruptcy flag removal on the payroll and employment of LBD firm owners. Our results indicate that there is an increase in both LBD payroll and employment, however this increase is insignificant at standard levels. The lack of power is presumably from the small fraction of bankrupt individuals who own employer-firms in the LBD. We therefore see online appendix F as inconclusive evidence regarding the importance of consumer credit access for payroll and hiring decisions. In future research, we plan to explore the impact of credit access on hiring patterns in more detail with a broader sample of firm owners.

[21] In particular, we add the coefficients on the flag removal dummy (e.g. 2 Years Before Removal (d)), interaction term (e.g. 2 Years Before Removal (d) x LBD Ownership, 2+ Yrs. (d)) and the ownership term (e.g. LBD Ownership, 2+ Yrs (d)), and we compute standard errors using the delta method.

5.9 Discussion of Selection Issues

Since flag removal is foreseeable, there may be concern that better entrepreneurs who anticipate the need for credit deliberately wait until the flag is removed to start a business. There are two ways we address this potential issue: (i) if 'better' entrepreneurs are waiting until their flag is removed in order to borrow and start a business, this simply reinforces the point that credit matters for startups, (ii) to test for selection more formally, we take advantage of the panel dimension to our data and we use standard selection correction methods. In online appendix H we show that the entrepreneurs who transition into self employment following flag removal are very similar in terms of prior self-employment income and prior labor earnings. And, in online appendix I, we use the heckit selection correction for self-employment transitions and formal-employment transitions, and we find very similar results.

Moreover, recent independent work by Gross et al. [2016] has also provided formal tests of the anticipation of bankruptcy flag removal by looking at credit application behavior. They show that rather than waiting an additional quarter for credit at more favorable rates after their flag is removed, individuals continue to apply for credit normally prior to the removal, indicating a lack of foresight.

5.10 Taking Stock: The Credit-Access Effect

By analyzing gross flows as opposed to levels, we were able to establish several facts in Sections 5.1 to 5.8. Namely, following bankruptcy flag removal there is (a) increased flow rates into self employment, (b) the fact that they flow into industries with high external finance needs and greater capital intensity, (c) disproportionate borrowing by new self-employed entrants relative to other job-transitioners, (d) the increased likelihood of starting an employer business, and (e) the large amount borrowed by new employer businesses. We believe that these facts, taken together, provide strong evidence of the credit-access effect. Our findings also indicate that credit access not only affects the self-employment decision, but also the decision to become an employer firm, i.e. credit-access influences both stages of entrepreneurship.

As robustness, we verify that our results regarding entrepreneurship and credit access hold in pooled SCF cross-sections from 1998-2010 in online appendix L.

6 Transitions Into and Out of Formal-Employment

We now turn our attention to gross formal-employment flows where we provide another set of facts that allows us to partially disentangle the credit-access effect from the credit-check effect. Among bankrupt individuals who transition into formal employment, we find that if they make that transition after flag removal as opposed to prior to flag removal, they have (i) significantly greater earnings, (ii) work for larger firms, (iii) are more likely to work in jobs that require handling of payments, and (iv) as we show in online appendix L in the SCF, they are more likely to work for firms with non-wage benefits such as pensions. We argue throughout the remainder of the section that these findings provide suggestive evidence of credit-checks precluding bankrupt workers from finding certain types of jobs.

Table 12 illustrates the impact of bankruptcy flag removal on formal-employment flows. Columns (1) and (2) show that for the baseline definition of formal employment, the flows in and flows out are insignificant. We attribute the lack of significance to the sample size and churn, since the levels increase significantly, but the flow regressions are essentially estimating coefficients on rare events with noise (since many of these individuals are marginally attached to the labor force, they may flow in and out of formal employment several times in the span on a few years).

In Table 12, if we define formal employment using a more stringent earnings threshold of \$5k, we do see flows into and out of formal employment increase significantly following flag removal. The flow rate into formal employment increases by .24% in the year of removal, relative to non-transitioners the control group. We can reject equality of coefficients on the dummy for the year of removal and the dummy for 2 years prior to removal, but the increase is short lived. The flow rate out of formal employment also increases following flag removal, suggesting that some individuals may be leaving formal employment to start businesses once they have credit access.

In online appendix E we illustrate the impact of flag removal on flows from self employment to formal employment, and vice versa. While point estimates imply that the transition rate from formal employment to self employment increases, the results cannot be distinguished from zero. This suggests that if individuals are leaving formal employment to start businesses after flag removal, they are first going through a spell of non-employment. However, we are unable For completeness, online appendix E also shows how bankruptcy flag removal impacts the odds of holding both a formal sector job and self-employed job, as well

as the odds of being only formal-employed and only self employed.

6.1 Earnings Among New Formal Sector Entrants

Table 13 includes interaction terms between the dummies surrounding the bankruptcy flag removal and an indicator for whether the individual transitioned into formal employment. Similar to Table 6, the non-interacted dummies around flag removal can be interpreted as the effect of flag removal on labor earnings of non-transitioners, i.e. those who remain employed throughout the flag removal; those dummies show a slightly declining profile of earnings for non-transitioners. However, the interaction terms in Table 13 illustrate that among individuals who transition into formal employment, earnings rise significantly, and this increase is largely driven by the interaction of having a bankruptcy flag removed and simultaneously transitioning into a formal sector job. For example, Column (1) shows that individuals who transition into formal employment 1 or more years after bankruptcy flag removal earn \$1,816 (= (4033-847)- (1459-89.74)) more than individuals who transition into formal employment 2 years prior to bankruptcy flag removal. Relative to the sample average of labor earnings which is \$41.5k (see Table 3), these labor earnings gains represent a 4.3% increase.

Column (2) of Table 13 shows that those who transition into formal sector employment earn less from self employment. This is an intuitive result, since the individual is taking a formal sector job, they have less time to devote to self employment.

Column (3) of Table 13 looks at the sum of labor earnings and self-employment earnings. Column (3) shows that individuals who transition into formal employment 1 or more years after bankruptcy flag removal have a total annual income that is \$1,696 (= (3726-870.7)-(1209-49.87)) more than individuals who transition into formal employment 2 years prior to bankruptcy flag removal. Relative to the sample average of total income which is \$34.8k, these gains are quite large, approaching 5% of the average individual's total income.

Figure 7 plots the summed coefficients from Column (3) of Table 13.[22] By summing the coefficients, we can compare those who transition into formal employment to non-transitioners in the control group (i.e. those who are 3 or more years before flag removal).[23]

[22]Standard errors are computed using the delta method.

[23]In particular, we add the coefficients on the flag removal dummy (e.g. 2 Years Before Removal (d)), interaction term (e.g. 2 Years Before Removal (d) x Trans. Into Formal-Employed, 1k (d)) and the transition

As the figure demonstrates, there is a stable trend in total income prior to flag removal. Following flag removal, the gains from transitioning into formal employment increase rapidly. The difference in total income for those who transition into formal employment one or more years after removal vs. 2 years prior to removal is $1,696 (= (3726-870.7)- (1209-49.87)). This calculation is illustrated on the graph.

6.2 Firm Size After Transitioning into Formal Employment

Column (1) of Table 14 shows that individuals who transition into formal employment following bankruptcy flag removal are more likely to work at a firm with 1000+ employees relative to individuals who transition into formal employment prior to flag removal. Column (1) shows that individuals who transition into formal employment 1 or more years after bankruptcy flag removal are 1.48% (= (.0357-.0034)- (.0188-.00126)) more likely to work at a firm with 1000+ employees than individuals who transition into formal employment 2 years prior to bankruptcy flag removal. Column (2) illustrates a similar result, showing that individuals who transition into formal employment following bankruptcy flag removal are more likely to work for firms with greater than 500 employees relative to those who transition into formal employment prior to bankruptcy flag removal. Column (3) shows that among those who transition into formal sector employment, the fraction of individuals who work for small and young firms (firms with 1 employee or less and 1 year in age or less) remains unchanged. However, regardless of labor market transitions, the fraction of individuals who work at young small firms drops by a small, but statistically significant amount .0855%.

These results suggest that individuals are finding jobs at larger firms which may provide better job security, health insurance, pensions etc. Since the LEHD does not cover healthcare or pensions, we show in online appendix L that in the SCF, following flag removal, individuals are more likely to work at larger firms that provide pensions; however, this result is only significant at the 10% level and occurs with a significant lag. Nonetheless, this suggests that individuals are able to obtain jobs with better non-wage benefits after bankruptcy flag removal.

term (e.g. Transition Into Formal-Employed, 1k (d)), and we compute standard errors using the delta method. The points on the plotted line can be interpreted as the increase in total income from entering formal employment, relative to non-transitioners in the control group.

6.3 Formal Sector Exit Rates and Job Turnover

Are those who transition into formal employment marginal workers? In online appendix G we explore this question by computing rates at which workers transit out of formal employment after finding a new job. In general, these newly employed workers are attached to the formal sector and are less likely to exit the formal sector after flag removal. In other words, individuals whose bankruptcy flags are dropped are no more likely to be separated from an employer when compared to other bankrupt individuals near flag removal. Their new job accession rate within the formal sector increases after flag removal, but their large and persistent wage gains suggest that these subsequent accessions are simply reflecting the fact that these workers are climbing the job ladder.

6.4 Industries of New Job Finders

In online appendix J, we stratify job finders by industry, and we show that workers are more likely to find jobs in the retail and service sectors after bankruptcy flag removal. Anecdotal evidence suggests that these sectors disproportionately involve the handling of payments and the use of cash registers.[24] We find weaker effects in sectors such as communications/transport and manufacturing, which are less likely to involve jobs which require handling payments.

6.5 Taking Stock: The Credit-Check Effect

In Section 5.4 and Sections 6.1 to 6.3 we demonstrated that if a bankrupt individual transitions into formal employment after flag removal as opposed to prior to flag removal, they (a) earn more, (b) work for larger firms with greater non-wage benefits, (c) find jobs in industries that require handling payments, and (d) do *not* borrow more than other transitioners (recall Section 5.4). We argue that these facts, taken together, provide strong evidence that credit-checks are generating the formal-employment flows we observe in our data.

[24] While there appears to be no systematic tabulations of cash handling across industries, the following websites https://www.glassdoor.com/Job/cash-handler-jobs-SRCH_KO0,12.htm and http://www.ehow.com/list_6941548_jobs-require-cash-handling-balancing.html include lists of jobs that require handling cash and they are primarily made of jobs such as 'cashier', 'bartender', 'server', etc. Employee theft accounts for 34.5% of inventory shrinkage at retailers, http://fortune.com/2015/06/24/shoplifting-worker-theft-cost-retailers-32-billion-in-2014/.

The fact that workers disproportionately flow into larger firms after flag removal may be because of two reasons: (1) credit-checks may have previously been preventing these individuals from obtaining jobs at large firms, or (2) following flag removal access to consumer credit allows individuals to smooth consumption while searching for higher paying job at larger and more productive firms. Existing evidence from Society for Human Resource Management [2012b] corroborates the credit-check explanation since small firms are 2x less likely to conduct background checks.[25] On the other hand, related work by Herkenhoff et al. [2015] shows that displaced workers borrow more and take longer to find a job if they have more credit access, providing support for the consumption smoothing explanation. However, the sample in this paper includes few displaced workers and as Section 5.4 shows, those who transition into formal employment after flag removal do not borrow disproportionately relative to other transitioners. This suggests that the consumption smoothing role is less important in the sample studied in the current paper, and individuals may be obtaining better jobs after flag removal because credit-checks by employers were previously limiting employment opportunities.

As Chen et al. [2013] and Society for Human Resource Management [2012b] discuss, the primary reason employers conduct credit checks is to reduce theft, and credit checks are primarily conducted for jobs that require the handling of cash. Our industry results suggest that credit checks may have been limiting bankrupt workers from finding retail and service sector jobs, which disproportionately involve handling payments, since individuals are more likely to flow into those jobs after bankruptcy flag removal. This additional evidence also points to credit checks as the mechanism for generating these patterns of job flows.

Ultimately, we are unable to observe credit checks directly, and so we take our set of facts as supportive, but not conclusive, evidence of credit-checks limiting employment opportunities of bankrupt individuals.

[25] Society for Human Resource Management [2012b] report that 45% of large firms (2,500 to 24,999 employees) conduct credit checks versus 25% of small firms (100 to 499 employees). Other studies by Society for Human Resource Management [2012a] and Zibarras and Woods [2010] find similar patterns for background checks, which may or may not include credit checks.

7 Conclusions

We construct a new administrative dataset in order to examine how consumer credit access impacts employment prospects, earnings, and entrepreneurship. Using a sample of 3 million prime age individuals, we show that self employment and LBD firm ownership are increasing functions of available credit. In contrast, formal employment declines as access to credit increases. Our results, which are based on direct measures of credit constraints, contrast with prior studies, including Hurst and Lusardi [2004], who find that business ownership, as well as self employment, are largely flat functions of wealth. Our findings are in agreement with Robb and Robinson [2012] who find that many startups receive debt financing through the personal balance sheets of the entrepreneur.

To isolate the causal impact of credit on labor market outcomes, we use bankruptcy flag removals to isolate a large discrete increase in credit access which is not directly associated with credit worthiness, wealth, or any other unobserved characteristics of the individual. We examine whether bankruptcy flag removals not only increase credit access, but also change the set of potential jobs available to a individual. We call these two effects from bankruptcy flag removal (i) the *credit access effect*, which is the way increased credit access following flag removal allows previously constrained individuals to start businesses or smooth consumption while searching for a job, and (ii) the *credit check effect*, which is the way bankruptcy flag removal gives individuals previously excluded from formal sector unemployment-insured jobs, the opportunity to obtain a formal sector job.

We demonstrate that following flag removal there is (a) an increased flow rate into self employment, (b) disproportionate borrowing by new self-employed entrants relative to other job-transitioners, (c) an increased likelihood of starting an employer business, (d) startups enter capital intensive and external finance intensive industries, and (e) disproportionate borrowing by new employer businesses. Entrepreneurs who own employer firms borrow on average $40k more after flag removal, a 33% gain relative to the sample average. Taken together, we view these facts as strong evidence of the credit-access effect. We take this set of facts as strong evidence of the credit-access effect especially for small entrepreneurial firms.

These last three findings, in particular, go beyond previous research and examine early entrepreneurial firms from the integrated longitudinal business database to show where consumer credit has the largest impact. Many of the measured impacts for formal employment

are small, but we show that there is a large impact on small entrepreneurial firms as we show that transitions from non-employer to employer businesses increase sharply - a new result that has not been examined anywhere previously to our knowledge. We also show there is large increase in borrowing by the owners of these firms that occurs in the year of hiring the first employee. We thus are the first, to our knowledge, to measure the causal impact of consumer credit access, inclusive of both unsecured and mortgage credit, on the rate at which individuals move from being a non-employer to employer business - hiring their first formal employee and the amount owners of new-employer firms borrow. We thus add to the work of Robb and Robinson [2012] who documents that small entrepreneurial firms borrow from banks as we show they also borrow using there own personal credit.

On the formal sector job side, we examine gross flows into new formal sector unemployment-insured jobs. Post-flag removal, entrants in the formal sector (a) earn more, (b) work for larger firms with greater non-wage benefits, (c) find jobs in industries that disproportionately require cash handling, but (d) do *not* necessarily borrow more. This last fact, in conjunction with limited evidence on background checks by firm size and in sectors that require cash handling, points toward credit-checks preventing bankrupt workers from obtaining jobs at large firms.

Our results have important policy implications, especially for the debate over credit checks and what banning credit checks would imply for the formal employment and self employment prospects of credit constrained individuals (Chen et al. [2013], Cortes et al. [2016], and Shoag and Clifford [2016]). In future work, which is beyond the scope of the paper, we believe the tools used in Glover and Corbae [2015] and Glover and Corbae [2017] can be used to assess the optimal information structure following bankruptcy.

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Table 1: Population Summary Statistics (Source: 100% Sample)

Variable	**Mean**	**Variable**	**Mean**
Lagged Credit Score	414.5	Transition Into Self-Employed, 1k (d)	3.7%
Real Annual Self-Employed Net Income (29.3k without 0s)	3,256	Transition Out of Self-Employed, 1k (d)	3.1%
Real Annual Labor Earnings (40.2k without 0s)	31,939	LBD Firm Ownership, 1+ Yrs	0.5%
Age	40.9	LBD Firm Ownership, 2+ Yrs	0.3%
Imputed Years of Education	13.1	Both Self and Formal Employed, 1k (d)	6.0%
Total Credit Balance	107,000	Non-Employed, 1k (d)	15.6%
Self-Employed, 1k (d)	11.1%	Formal Employed, 1k (d)	79.4%
Observations (millions)	16.40		

Table 2: Population Relationship Between Self/Formal Employment Outcomes and Credit Scores. (Source: 100% Sample).

	(1) Self Employed, 1k (d)	**(2)** Transition Into Self-Employed, 1k (d)	**(3)** Transition Out of Self-Employed, 1k (d)	**(4)** LBD Firm Ownership, 1+ Yrs	**(5)** LBD Firm Ownership, 2+ Yrs	**(6)** Formal Employed, 1k (d)
Unused Revolving Credit Decile 3	0.00189***	0.00123***	-0.000176	0.000142***	7.78e-05**	-0.00179***
	(0.000299)	(0.000249)	(0.000222)	(5.13e-05)	(3.89e-05)	(0.000380)
Unused Revolving Credit Decile 4	0.00229***	0.00150***	-9.31e-05	0.000182***	0.000128***	-0.00290***
	(0.000286)	(0.000232)	(0.000208)	(5.49e-05)	(4.21e-05)	(0.000359)
Unused Revolving Credit Decile 5	0.00375***	0.00292***	0.000178	0.000216***	0.000163***	-0.00362***
	(0.000310)	(0.000249)	(0.000224)	(6.25e-05)	(4.94e-05)	(0.000384)
Unused Revolving Credit Decile 6	0.00517***	0.00364***	-0.000279	0.000233***	0.000110**	-0.00393***
	(0.000336)	(0.000266)	(0.000240)	(7.03e-05)	(5.56e-05)	(0.000411)
Unused Revolving Credit Decile 7	0.00619***	0.00462***	2.46e-05	0.000279***	0.000148**	-0.00507***
	(0.000366)	(0.000287)	(0.000259)	(7.89e-05)	(6.31e-05)	(0.000441)
Unused Revolving Credit Decile 8	0.00770***	0.00608***	0.000371	0.000212**	0.000163**	-0.00599***
	(0.000408)	(0.000315)	(0.000286)	(9.20e-05)	(7.47e-05)	(0.000486)
Unused Revolving Credit Decile 9	0.0101***	0.00806***	-0.000126	0.000340***	0.000156*	-0.00812***
	(0.000470)	(0.000358)	(0.000325)	(0.000112)	(9.15e-05)	(0.000550)
Unused Revolving Credit Decile 10	0.0109***	0.00907***	-6.03e-05	0.000732***	0.000458***	-0.0116***
	(0.000569)	(0.000429)	(0.000392)	(0.000149)	(0.000123)	(0.000649)
Fixed Effects	Y	Y	Y	Y	Y	Y
Controls	Y	Y	Y	Y	Y	Y
R-squared	0.019	0.061	0.074	0.002	0.001	0.170
Individuals (millions)	3.06	3.06	3.06	3.06	3.06	3.06
Total Person-Year Obs. (millions)	16.40	16.40	16.40	16.40	16.40	16.40

*Notes: SE in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Controls include: deciles of credit scores dummies, deciles of unused mortgage credit dummies, deciles of unused non-mortgage and non-revolving credit dummies, lagged labor earnings and self-employed income, deciles of cumulative lagged earnings dummies, quadratics in age and tenure. Fixed effects include individual fixed effects and year dummies.*

Table 3: Summary Statistics Before and After Flag Removal

	Sample Averages			
	(1)	(2)	(3)	(4)
	1 Yr. Before Flag Drop	1 Yr. After Flag Drop	Diff. ((1)-(2))	Sig. Diff.
(A) Employment Stocks				
Formal-Employed, 1k (d)	78.70%	78.60%	-0.10%	
Self-Employed, 1k (d)	9.00%	9.60%	0.60%	*
Both SE and Formal-Employed, 1k (d)	6.10%	6.40%	0.30%	*
Non-Employed, 1k (d)	18.40%	18.20%	-0.20%	
LBD Firm Ownership, 1+ Yrs. (d)	0.40%	0.40%	0.00%	
LBD Firm Ownership, 2+ Yrs. (d)	0.20%	0.30%	0.10%	*
Employer Size≥500 (d)	31.70%	32.00%	0.30%	*
Employer Size≥1000 (d)	25.40%	25.60%	0.20%	
(B) Employment Flows				
Transition into Formal-Employed, 1k (d)	4.60%	4.50%	-0.10%	
Transition out of Formal-Employed, 1k (d)	4.40%	4.50%	0.10%	
Transition into Self-Employed, 1k (d)	3.10%	3.40%	0.30%	*
Transition out of Self-Employed, 1k (d)	2.80%	2.80%	0.00%	
New Formal Job Accession Next Year (d)	17.30%	17.00%	-0.30%	*
(C) Earnings				
Real Annual Labor Earnings ($41.5k without 0s)	$32,683	$33,005	$323	*
Real Annual Self-Employed Net Income ($23.8k without 0s)	$2,140	$2,300	$161	*
Real Annual Total Income (SE and Non-SE)	$34,822	$35,305	$483	*
(D) Credit Variables				
Credit Score	288.0	351.8	63.8	*
Real Bankcard Balance	$3,441	$4,467	$1,027	*
Real Revolving Balance	$7,601	$10,475	$2,874	*
Real Mortgage Balance	$92,417	$104,000	$11,583	*
Real HELOC Balance	$3,355	$5,181	$1,825	*
Observations	170000	110000		

Notes: Column (1) computes averages using the individuals in our sample who are 1 year before bankruptcy flag removal. Column (2) computes averages using the individuals in our sample who are 1 year after bankruptcy flag removal. Column (3) is the difference in means between Columns (1) and (2), and Column (4) indicates if that difference in means is significant at the 10% level. The symbol (d) indicates a dummy variable. Formal-Employed, 1k (d) is a dummy that equals one when an individual earned at least $1k in a UI insured job covered by the LEHD. Self-Employed, 1k (d) is a dummy that equals one when an individual earned at least $1k in net income on their 1040 Schedule C. LBD Firm Ownership, 1+ Yrs (d) is a dummy for LBD firm ownership of 1 or more years. LBD Firm Ownership, 2+ Yrs (d) is a dummy for LBD firm ownership of 2 or more years. For all other definitions, see Section 1.1.

Table 4: Baseline Results: Credit Scores, Formal-Employment, and Self-Employment Levels

	(1) Credit Score	**(2)** Credit Score	**(3)** Formal-Employed (d)	**(4)** Formal-Employed, 5k (d)	**(5)** Self-Employed (d)	**(6)** Self-Employed, 5k (d)
2 Years Before Removal (d)	66.52***	19.70***	0.000308	0.000425	0.000600	0.000919
	(0.513)	(0.444)	(0.000897)	(0.000914)	(0.000701)	(0.000597)
1 Year Before Removal (d)	76.39***	13.26***	0.00154	0.00129	-0.000384	0.000353
	(0.528)	(0.592)	(0.00120)	(0.00121)	(0.000903)	(0.000772)
Year of Removal (d)	148.2***	68.70***	0.00289*	0.00292*	0.000950	0.00108
	(0.675)	(0.798)	(0.00149)	(0.00151)	(0.00112)	(0.000955)
1+ Years After Removal (d)	119.1***	7.046***	0.00465**	0.00323*	0.00108	0.000983
	(0.524)	(0.939)	(0.00185)	(0.00187)	(0.00137)	(0.00117)
Individual Fixed Effects	N	Y	Y	Y	Y	Y
Year Fixed Effects	N	Y	Y	Y	Y	Y
Age and Tenure Controls	N	Y	Y	Y	Y	Y
R-squared	0.116	0.134	0.122	0.122	0.003	0.003
Indiv-Yr Obs.	1.500e+06	1.500e+06	1.500e+06	1.500e+06	1.500e+06	1.500e+06
No. of Indiv.	220000	220000	220000	220000	220000	220000
Sig Diff 1+Yr & -2Yr at 10%	Y	Y	Y	Y	N	N
Sig Diff 0Yr & -2Yr at 10%	Y	Y	Y	Y	N	N

*Notes: SE in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Age and Tenure controls include quadratics in age and tenure. The symbol (d) indicates a dummy variable. Credit score refers to the TransUnion bankruptcy score. For formal employment and self employment definitions, see Section 1.1. 'Sig Diff 1+Yr & -2Yr at 10%' is an indicator that the coefficients are different on the terms '1+ Years After Removal (d)' and '2 Years Before Removal (d)' at the 10% level. 'Sig Diff 0Yr & -2Yr at 10%' is an indicator that the coefficients are different on the terms 'Year of Removal (d)' and '2 Years Before Removal (d)' at the 10% level.*

Table 5: Baseline Self-Employment Flows

	(1) Transition into Self-Employed, 1k (d)	**(2)** Transition out of Self-Employed, 1k (d)	**(3)** Transition into Self-Employed, 5k (d)	**(4)** Transition out of Self-Employed, 5k (d)
2 Years Before Removal (d)	0.000527	0.000898*	0.000536	0.000644
	(0.000576)	(0.000540)	(0.000491)	(0.000458)
1 Year Before Removal (d)	2.64e-05	0.00137**	0.000219	0.000939*
	(0.000635)	(0.000598)	(0.000540)	(0.000509)
Year of Removal (d)	0.00161**	0.00169**	0.00107*	0.00131**
	(0.000740)	(0.000691)	(0.000630)	(0.000590)
1+ Years After Removal (d)	0.000649	0.00222***	0.000119	0.00149**
	(0.000891)	(0.000837)	(0.000757)	(0.000708)
Individual Fixed Effects	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y
Age and Tenure Controls	Y	Y	Y	Y
R-squared	0.000	0.001	0.000	0.001
Indiv-Yr Obs.	1.500e+06	1.500e+06	1.500e+06	1.500e+06
No. of Indiv.	220000	220000	220000	220000
Sig Diff 1+Yr & -2Yr at 10%	N	Y	N	N
Sig Diff 0Yr & -2Yr at 10%	N	N	N	N

*Notes: SE in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Age and Tenure controls include quadratics in age and tenure. Fixed Effects include individual fixed effects and year dummies. Transition into Self-Employed, 1k (d) is a dummy that takes the value 1 when an individual earns less than $1k of self-employed earnings this year, and more than $1k of self-employed earnings this year.*

Table 6: Transitions into Self-Employment: Earnings

	(1) Real Annual Earnings	**(2)** Real Self-Employed Net Income	**(3)** Real Total Income (SE and Non-SE)
2 Years Before Removal (d)	-6.046	-47.61**	-53.66
	(44.85)	(20.08)	(47.42)
1 Year Before Removal (d)	-111.5*	-78.49***	-190.0***
	(61.86)	(27.70)	(65.21)
Year of Removal (d)	-205.6***	-101.3***	-306.9***
	(77.99)	(34.61)	(82.02)
1+ Years After Removal (d)	-603.5***	-158.2***	-761.7***
	(96.19)	(43.52)	(101.2)
Transition Into Self-Employed, 1k (d)	-1,506***	8,522***	7,016***
	(116.6)	(123.4)	(154.0)
2 Yrs. Before Removal (d) x Trans Into Self-Employed, 1k (d)	-645.0**	2,274***	1,629***
	(273.8)	(268.1)	(345.9)
1 Yr. Before Removal (d) x Trans Into Self-Employed, 1k (d)	-1,138***	2,185***	1,048***
	(272.8)	(274.8)	(346.5)
Yr. of Removal (d) x Trans Into Self-Employed, 1k (d)	-1,534***	2,704***	1,170***
	(295.2)	(297.7)	(376.4)
1+ Yrs. After Removal (d) x Trans Into Self-Employed, 1k (d)	-1,709***	3,376***	1,667***
	(216.4)	(212.7)	(273.8)
Individual Fixed Effects	Y	Y	Y
Year Fixed Effects	Y	Y	Y
Age and Tenure Controls	Y	Y	Y
R-squared	0.122	0.077	0.105
No. Person-Yr Obs.	1.500e+06	1.500e+06	1.500e+06
No. of Indiv.	220000	220000	220000
Combined Coeff Diff 1+Yr & -2Yr	-1,661	991	-670
Combined Coeff Diff Sig at 10%	Y	Y	Y

*Notes: SE in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Age and Tenure controls include quadratics in age and tenure. Fixed Effects include individual fixed effects and year dummies. The row titled 'Combined Coeff Diff 1+ Yrs & -2 Yrs' calculates the difference in the summed coefficients for those who transition 1 year after flag removal (Sum the coefficients on '1+ Years After Removal (d)' +'1+ Yrs. After Removal (d) x Trans into Self-Empl, 1k (d)'=3376-158.2) minus the summed coefficients for those who transition 2 years before flag removal (=2274-47.61). Taking the difference yields $991 (=(3376-158.2)-(2274-47.61)) which is the additional amount earned by those who transition into self employment 1 year after flag removal, relative to 2 years before. The titled 'Combined Coeff Diff Sig at 10%' is an indicator if that difference is significant at the 10% level.*

Table 7: Transitions into Self-Employment: Borrowing

	(1) Real Bankcard Balance	**(2)** Real Revolving Balance	**(3)** Real Mortgage Balance	**(4)** Real HELOC Balance	**(5)** Real Total Balance
2 Years Before Removal (d)	202.1***	1,112***	6,023***	759.8***	8,809***
	(13.09)	(40.60)	(329.1)	(47.46)	(350.1)
1 Year Before Removal (d)	336.3***	1,793***	8,957***	1,377***	13,038***
	(18.21)	(56.30)	(443.1)	(66.35)	(475.3)
Year of Removal (d)	586.4***	2,735***	10,387***	1,978***	15,800***
	(23.83)	(72.19)	(556.3)	(84.78)	(598.6)
1+ Years After Removal (d)	892.7***	4,257***	8,084***	3,551***	14,373***
	(28.47)	(83.77)	(675.8)	(98.35)	(728.1)
Transition Into Self-Employed (d)	-62.55***	-461.9***	-5,635***	-486.9***	-6,483***
	(24.01)	(75.81)	(742.6)	(88.90)	(790.1)
2 Yrs. Before Removal (d) x Trans Into Self-Employed, 1k (d)	99.73	298.4	5,642***	277.8	6,422***
	(66.47)	(216.5)	(1,835)	(270.1)	(1,955)
1 Yr. Before Removal (d) x Trans Into Self-Employed, 1k (d)	91.64	822.2***	10,086***	575.8*	11,815***
	(74.23)	(252.3)	(1,875)	(298.1)	(2,011)
Yr. of Removal (d) x Trans Into Self-Employed, 1k (d)	46.52	598.9**	7,348***	640.2*	8,511***
	(86.61)	(271.6)	(2,026)	(331.9)	(2,162)
1+ Yrs. After Removal (d) x Trans Into Self-Employed, 1k (d)	416.6***	1,610***	13,714***	1,253***	16,195***
	(74.15)	(211.2)	(1,483)	(267.9)	(1,594)
Individual Fixed Effects	Y	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y	Y
Age and Tenure Controls	Y	Y	Y	Y	Y
R-squared	0.027	0.050	0.092	0.026	0.105
No. Person-Yr Obs.	1.500e+06	1.500e+06	1.500e+06	1.500e+06	1.500e+06
No. of Indiv.	220000	220000	220000	220000	220000
Combined Coeff Diff 1+ Yrs & -2 Yrs	1,007	4,457	10,133	3,766	15,337
Combined Coeff Diff Sig at 10%	Y	Y	Y	Y	Y

*Notes: SE in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Age and Tenure controls include quadratics in age and tenure. Fixed Effects include individual fixed effects and year dummies. 'Combined Coeff Diff 1+ Yrs & -2 Yrs' compares the overall effect of transitioning 1+ years after flag removal to the overall effect of transitioning 2 years before flag removal. See Table 6 for more details.*

Table 8: Comparison of Total Borrowing by Newly Formal-Employed and Newly Self-Employed.

	(1) Total Balance		(2) Total Balance
	Formal Trans.		**Self-Empl Trans.**
2 Years Before Removal (d)	9,234***	2 Years Before Removal (d)	8,809***
	(353.2)		(350.1)
1 Year Before Removal (d)	13,483***	1 Year Before Removal (d)	13,038***
	(478.8)		(475.3)
Year of Removal (d)	16,355***	Year of Removal (d)	15,800***
	(602.0)		(598.6)
1+ Years After Removal (d)	15,220***	1+ Years After Removal (d)	14,373***
	(729.9)		(728.1)
Transition into **Formal-Employed**, 1k (d)	-1,976***	Transition Into **Self-Employed** (d)	-6,483***
	(536.2)		(790.1)
2 Yrs. Before Removal (d) x Trans into **Formal-Empl**, 1k (d)	-5,095***	2 Yrs. Before Removal (d) x Trans Into **Self-Empl**, 1k (d)	6,422***
	(1,361)		(1,955)
1 Yr. Before Removal (d) x Trans into **Formal-Empl**, 1k (d)	-1,600	1 Yr. Before Removal (d) x Trans Into **Self-Empl**, 1k (d)	11,815***
	(1,453)		(2,011)
Yr. of Removal (d) x Trans into **Formal-Empl**, 1k (d)	-6,143***	Yr. of Removal (d) x Trans Into **Self-Empl**, 1k (d)	8,511***
	(1,616)		(2,162)
1+ Yrs. After Removal (d) x Trans into **Formal-Empl**, 1k (d)	-6,555***	1+ Yrs. After Removal (d) x Trans Into **Self-Empl**, 1k (d)	16,195***
	(1,164)		(1,594)
Individual Fixed Effects	Y	Individual Fixed Effects	Y
Year Fixed Effects	Y	Year Fixed Effects	Y
Age and Tenure Controls	Y	Age and Tenure Controls	Y
R-squared	0.105	R-squared	0.105
No. Person-Yr Obs.	1.500e+06	No. Person-Yr Obs.	1.500e+06
No. of Indiv.	220000	No. of Indiv.	220000
Combined Coeff Diff 1+ Yrs & -2 Yrs	4,526		15,337
Combined Coeff Diff Sig at 10%	Y		Y

*Notes: SE in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Age and Tenure controls include quadratics in age and tenure. Fixed Effects include individual fixed effects and year dummies. 'Combined Coeff Diff 1+ Yrs & -2 Yrs' compares the overall effect of transitioning 1+ years after flag removal to the overall effect of transitioning 2 years before flag removal. See Table 6 for more details.*

Table 9: Ownership of LBD Firms

	(1) LBD Firm Ownership, 1+ Yrs (d)	**(2)** LBD Firm Ownership, 2+ Yrs (d)
2 Years Before Removal (d)	-0.000126	1.30e-05
	(0.000172)	(0.000110)
1 Year Before Removal (d)	-0.000110	0.000113
	(0.000215)	(0.000149)
Year of Removal (d)	0.000179	0.000394**
	(0.000259)	(0.000191)
1+ Years After Removal (d)	0.000297	0.000540**
	(0.000334)	(0.000230)
Individual Fixed Effects	Y	Y
Year Fixed Effects	Y	Y
Age and Tenure Controls	Y	Y
R-squared	0.001	0.000
Indiv-Yr Obs.	1.500e+06	1.500e+06
No. of Indiv.	220000	220000
Sig Diff 1+Yr & -2Yr at 10%	N	Y
Sig Diff 0Yr & -2Yr at 10%	N	Y

*Notes: SE in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The symbol (d) indicates a dummy variable. Age and Tenure controls include quadratics in age and tenure. LBD Firm Ownership, 1+ Yrs (d) is a dummy for LBD firm ownership of 1 or more years. LBD Firm Ownership, 2+ Yrs (d) is a dummy for LBD firm ownership of 2 or more years. For more details on LBD firm ownership measures, see Section 1.1.*

Table 10: LBD Ownership and Borrowing

	(1) Real Bankcard Balance	**(2)** Real Revolving Balance	**(3)** Real Mortgage Balance	**(4)** Real HELOC Balance	**(5)** Real Total Balance
2 Years Before Removal (d)	205.0***	1,116***	6,189***	766.9***	8,991***
	(12.96)	(40.32)	(326.3)	(47.19)	(347.2)
1 Year Before Removal (d)	338.4***	1,812***	9,273***	1,388***	13,406***
	(18.10)	(56.18)	(441.9)	(66.23)	(474.3)
Year of Removal (d)	586.0***	2,745***	10,597***	1,988***	16,045***
	(23.73)	(72.00)	(555.6)	(84.50)	(598.0)
1+ Years After Removal (d)	904.1***	4,291***	8,462***	3,576***	14,812***
	(28.44)	(83.73)	(675.5)	(98.32)	(728.0)
LBD Ownership, 2+ Yrs. (d)	-195.6	-3,055***	-16,342**	-3,674***	-17,637**
	(172.8)	(808.7)	(6,410)	(989.6)	(6,862)
2 Yrs. Before Removal (d) x LBD Ownership, 2+ Yrs. (d)	175.4	3,682***	7,493	1,317	13,318
	(300.3)	(1,269)	(9,526)	(1,408)	(10,209)
1 Yr. Before Removal (d) x LBD Ownership, 2+ Yrs. (d)	449.7	4,326***	4,209	4,520**	6,382
	(334.4)	(1,646)	(10,123)	(2,149)	(10,937)
Yr. of Removal (d) x LBD Ownership, 2+ Yrs. (d)	902.0**	4,843***	18,303*	5,953**	20,255*
	(383.7)	(1,742)	(10,899)	(2,437)	(11,717)
1+ Yrs. After Removal (d) x LBD Ownership, 2+ Yrs. (d)	1,067***	8,645***	37,997***	7,716***	47,332***
	(406.2)	(1,487)	(9,793)	(2,030)	(10,710)
Individual Fixed Effects	Y	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y	Y
Age and Tenure Controls	Y	Y	Y	Y	Y
R-squared	0.027	0.050	0.092	0.026	0.105
No. Person-Yr Obs.	1.500e+06	1.500e+06	1.500e+06	1.500e+06	1.500e+06
No. of Indiv.	220000	220000	220000	220000	220000
Combined Coeff Diff 1+ Yrs & -2 Yrs	1,591	8,138	32,777	9,208	39,835
Combined Coeff Diff Sig at 10%	Y	Y	Y	Y	Y

*Notes: SE in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Age and Tenure controls include quadratics in age and tenure. Fixed Effects include individual fixed effects and year dummies. 'Combined Coeff Diff 1+ Yrs & -2 Yrs' compares the overall effect of transitioning 1+ years after flag removal to the overall effect of transitioning 2 years before flag removal. See Table 6 for more details.*

Table 11: LBD Firm Ownership and Subsequent Turnover Among Newly Self-Employed

	LBD Firm Ownership, 2+Yrs (d)	Transition out of Self-Employment Next Yr., 1k (d)
2 Years Before Removal (d)	-8.93e-05	0.000481
	(9.33e-05)	(0.000456)
1 Year Before Removal (d)	-2.84e-05	0.000153
	(0.000132)	(0.000509)
Year of Removal (d)	0.000145	0.000583
	(0.000171)	(0.000602)
1+ Years After Removal (d)	0.000204	0.00117
	(0.000223)	(0.000754)
Transition Into Self-Employed (d)	0.00936***	0.380***
	(0.000692)	(0.00392)
2 Yrs. Before Removal (d) x Trans Into Self-Employed, 1k (d)	0.00312*	-0.00672
	(0.00162)	(0.00830)
1 Yr. Before Removal (d) x Trans Into Self-Employed, 1k (d)	0.00451***	0.00761
	(0.00172)	(0.00850)
Yr. of Removal (d) x Trans Into Self-Employed, 1k (d)	0.00694***	-0.0128
	(0.00191)	(0.00889)
1+ Yrs. After Removal (d) x Trans Into Self-Employed, 1k (d)	0.00979***	0.00437
	(0.00145)	(0.00649)
Individual Fixed Effects	Y	Y
Year Fixed Effects	Y	Y
Age and Tenure Controls	Y	Y
R-squared	0.006	0.158
No. Person-Yr Obs	1.500e+06	1.500e+06
No. Indiv.	220000	220000
Combined Coeff Diff 1+ Yrs & -2 Yrs	0.70%	1.18%
Combined Coeff Diff Sig at 10%	Y	N

*Notes: SE in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Age and Tenure controls include quadratics in age and tenure. Fixed Effects include individual fixed effects and year dummies. 'Combined Coeff Diff 1+ Yrs & -2 Yrs' compares the overall effect of transitioning 1+ years after flag removal to the overall effect of transitioning 2 years before flag removal. See Table 6 for more details.*

Table 12: Baseline Formal-Employment Flows

	(1) Transition into Formal-Employed, 1k (d)	**(2)** Transition out of Formal-Employed, 1k (d)	**(3)** Transition into Formal-Employed, 5k (d)	**(4)** Transition out of Formal-Employed, 5k (d)
2 Years Before Removal (d)	-0.000892	0.000709	0.000788	0.000595
	(0.000687)	(0.000686)	(0.000711)	(0.000703)
1 Year Before Removal (d)	0.000127	0.000421	0.00118	0.000927
	(0.000763)	(0.000764)	(0.000786)	(0.000784)
Year of Removal (d)	-0.000380	0.000932	0.00241***	0.00224**
	(0.000878)	(0.000887)	(0.000907)	(0.000912)
1+ Years After Removal (d)	-0.00121	0.00168	0.000713	0.00303***
	(0.00107)	(0.00108)	(0.00110)	(0.00111)
Individual Fixed Effects	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y
Age and Tenure Controls	Y	Y	Y	Y
R-squared	0.026	0.026	0.018	0.011
Indiv-Yr Obs.	1.500e+06	1.500e+06	1.500e+06	1.500e+06
No. of Indiv.	220000	220000	220000	220000
Sig Diff 1+Yr & -2Yr at 10%	N	N	N	Y
Sig Diff 0Yr & -2Yr at 10%	N	N	Y	Y

*Notes: SE in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Age and Tenure controls include quadratics in age and tenure. Fixed Effects include individual fixed effects and year dummies. Transition into Formal-Employed, 1k (d) is a dummy that takes the value 1 if the individual earned less than $1k in formal sector earnings last year, and greater than $1k in formal sector earnings this year.*

Table 13: Transitions into Formal Employment: Earnings

	(1) Real Annual Labor Earnings	**(2)** Real Annual Self-Employed Net Income	**(3)** Real Annual Total Income (SE and Non-SE)
2 Years Before Removal (d)	-89.74**	39.87*	-49.87
	(44.94)	(22.45)	(48.18)
1 Year Before Removal (d)	-239.8***	11.64	-228.1***
	(62.11)	(29.39)	(65.74)
Year of Removal (d)	-381.2***	10.57	-370.6***
	(78.42)	(36.76)	(82.76)
1+ Years After Removal (d)	-847.1***	-23.63	-870.7***
	(96.50)	(44.79)	(101.7)
Transition into Formal-Employed, 1k (d)	2,673***	-332.2***	2,341***
	(91.15)	(47.31)	(98.08)
2 Yrs. Before Removal (d) x Trans. into Formal-Employed, 1k (d)	1,459***	-249.9**	1,209***
	(207.1)	(110.8)	(225.6)
1 Yr. Before Removal (d) x Trans. into Formal-Employed, 1k (d)	2,013***	-455.0***	1,558***
	(215.0)	(117.5)	(235.6)
Yr. of Removal (d) x Trans. into Formal-Employed, 1k (d)	2,695***	-140.5	2,554***
	(237.3)	(131.0)	(259.2)
1+ Yrs. After Removal (d) x Trans. into Formal-Employed, 1k (d)	4,033***	-307.3***	3,726***
	(169.9)	(91.28)	(185.4)
Individual Fixed Effects	Y	Y	Y
Year Fixed Effects	Y	Y	Y
Age and Tenure Controls	Y	Y	Y
R-squared	0.126	0.004	0.100
No. Person-Yr Obs.	1.500e+06	1.500e+06	1.500e+06
No. of Indiv.	220000	220000	220000
Combined Coeff Diff 1+ Yrs & -2 Yrs	1,817	-121	1,696
Combined Coeff Diff Sig at 10%	Y	N	Y

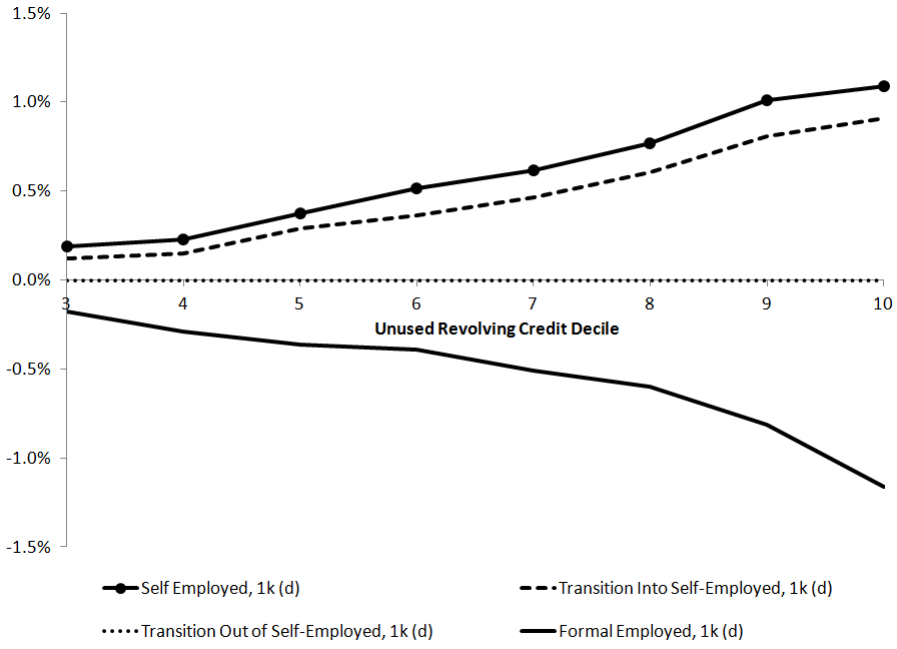
*Notes: SE in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Age and Tenure controls include quadratics in age and tenure. Fixed Effects include individual fixed effects and year dummies. 'Combined Coeff Diff 1+ Yrs & -2 Yrs' compares the overall effect of transitioning 1+ years after flag removal to the overall effect of transitioning 2 years before flag removal. See Table 6 for more details.*

Table 14: Transitions into Formal Employment: Firm Size

	(1) Employer Size≥1000 (d)	**(2)** Employer Size≥500 (d)	**(3)** Employer Size≤1 & Age≤1 Yr. (d)
2 Years Before Removal (d)	-0.00126	-0.00121	2.43e-05
	(0.000868)	(0.000950)	(0.000286)
1 Year Before Removal (d)	-0.00205*	-0.000788	-3.53e-05
	(0.00115)	(0.00125)	(0.000346)
Year of Removal (d)	-0.00199	0.000167	-0.000559
	(0.00143)	(0.00155)	(0.000409)
1+ Years After Removal (d)	-0.00344*	-0.000773	-0.000855*
	(0.00178)	(0.00193)	(0.000515)
Transition into Formal-Employed, 1k (d)	0.0911***	0.114***	0.0350***
	(0.00196)	(0.00214)	(0.00117)
2 Yrs. Before Removal (d) x Trans into Formal-Employed, 1k (d)	0.0188***	0.0292***	-0.00261
	(0.00454)	(0.00499)	(0.00258)
1 Yr. Before Removal (d) x Trans into Formal-Employed, 1k (d)	0.0147***	0.0210***	0.00481*
	(0.00452)	(0.00498)	(0.00274)
Yr. of Removal (d) x Trans into Formal-Employed, 1k (d)	0.0206***	0.0268***	0.00329
	(0.00490)	(0.00537)	(0.00295)
1+ Yrs. After Removal (d) x Trans into Formal-Employed, 1k (d)	0.0357***	0.0511***	0.00310
	(0.00357)	(0.00394)	(0.00208)
Individual Fixed Effects	Y	Y	Y
Year Fixed Effects	Y	Y	Y
Age and Tenure Controls	Y	Y	Y
R-squared	0.013	0.017	0.009
No. Person-Yr Obs.	1.500e+06	1.500e+06	1.500e+06
No. of Indiv.	220000	220000	220000
Combined Coeff Diff 1+ Yrs & -2 Yrs	1.47%	2.23%	0.48%
Combined Coeff Diff Sig at 10%	Y	Y	Y

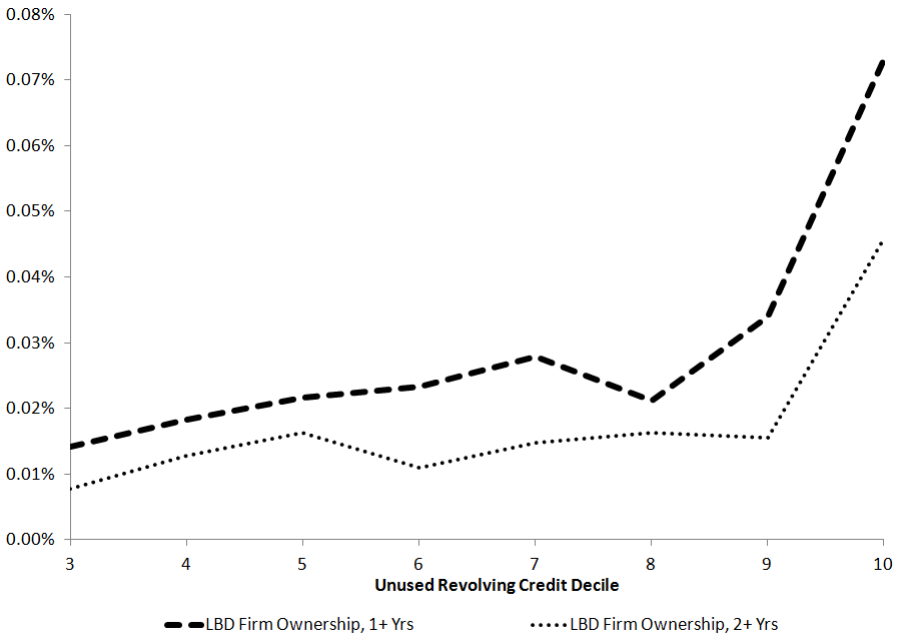
*Notes: SE in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Age and Tenure controls include quadratics in age and tenure. Fixed Effects include individual fixed effects and year dummies. Employer Size≥1000 (d) is a dummy that takes the value 1 when an individual works at an employer with 1000+ other employees. Employer size is measured with respect to the SEIN and taken as the average of 4th quarter monthly employment. 'Combined Coeff Diff 1+ Yrs & -2 Yrs' compares the overall effect of transitioning 1+ years after flag removal to the overall effect of transitioning 2 years before flag removal. See Table 6 for more details.*

Figure 1: Self Employment and Formal Employment By Unused Revolving Credit Decile (Coefficients plotted from Table 2)



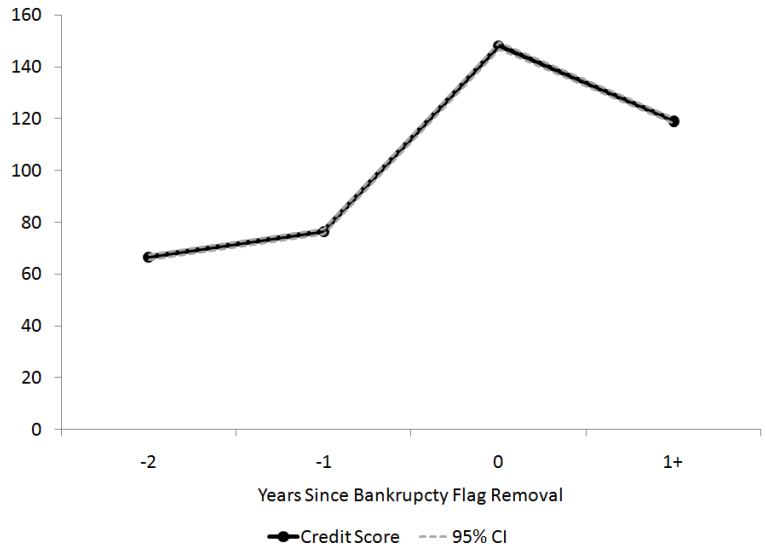
Notes: Coefficients from Unsecured Revolving Credit Deciles in Table 2, Cols (1), (2), (3), and (6).

Figure 2: LBD Firm Ownership By Unused Revolving Credit Decile (Coefficients plotted from Table 2)



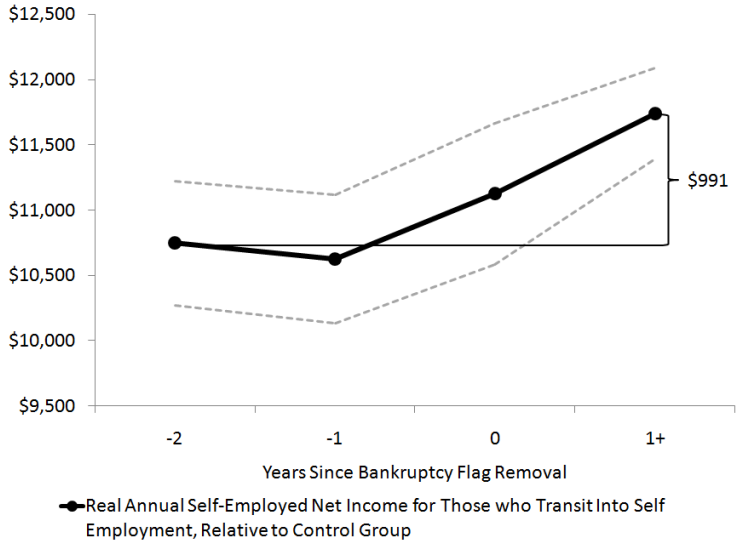
Notes: Coefficients from Unsecured Revolving Credit Deciles in Table 2, Cols (4) and (5).

Figure 3: Bankruptcy Score (Coefficients plotted from Table 4, Column (1))



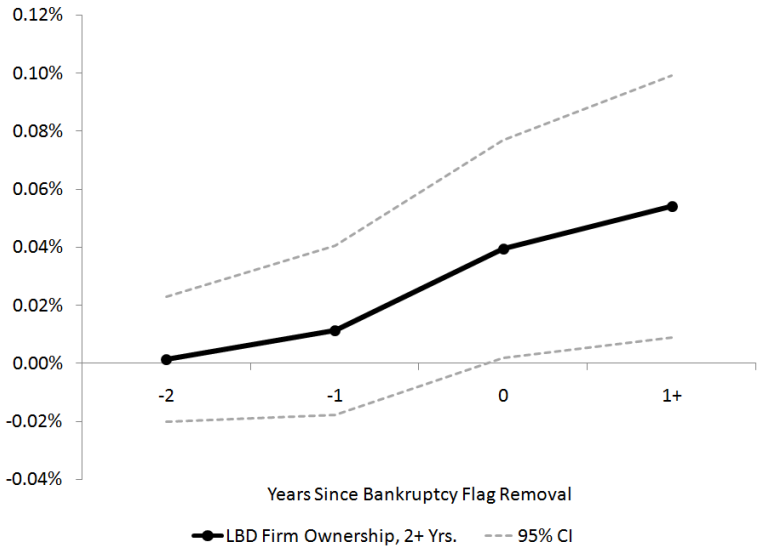
Notes: Coefficients from Table 4, Column (1). Standard errors clustered at individual level.

Figure 4: Impact of Flag Removal on Self-Employed Income, for Those who Transition into Self-Employment (Summed Coefficients Plotted from Col. (2), Table 6)



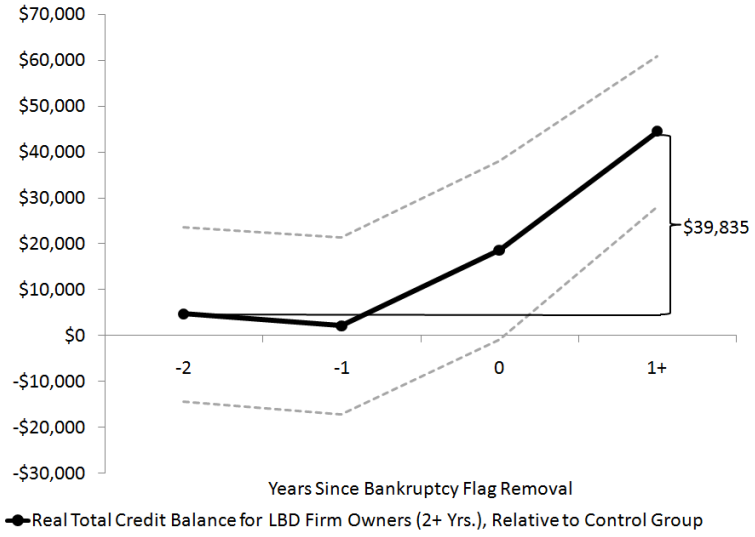
Notes: Coefficients from Col. (2), Table 6. Sum of coefficients on the flag removal dummy (e.g. 2 Years Before Removal (d)), interaction term (e.g. 2 Years Before Removal (d) x Trans. Into Self-Employed, 1k (d)) and the transition term (e.g. Transition Into Self-Employed, 1k (d)), and we compute standard errors using the delta method. The points on the plotted line can be interpreted as the differential gain in self-employed income from entering self employment, relative to a non-transitioner in the control group, where the control group is those who are 3+ years prior to flag removal.

Figure 5: LBD Firm Ownership (Coefficients Plotted from Table 9, Column (2))



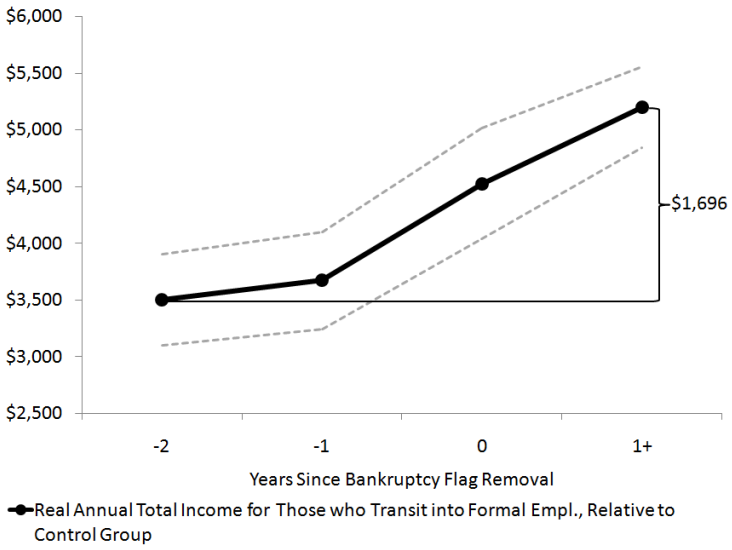
Notes: Coefficients from Table 9, Column (2). Standard errors clustered at individual level. LBD firm ownership defined as 2+ years of firm ownership (i.e. two consecutive firmid links). Must employ at least 1 worker to be in LBD.

Figure 6: Impact of Flag Removal on Total Credit Balances, for Those who Own Firms in LBD (2+ Yrs.) (Summed Coefficients Plotted from Col. (5), Table 10)



Notes: Coefficients from Col. (5), Table 10. Sum of coefficients on the flag removal dummy (e.g. 2 Years Before Removal (d)), interaction term (e.g. 2 Years Before Removal (d) x LBD Ownership, 2+ Yrs. (d)) and the ownership term (e.g. LBD Ownership, 2+ Yrs (d)), and we compute standard errors using the delta method. The points on the plotted line can be interpreted as the differential increase in borrowing from LBD firm owners, relative to non-owners in the control group, where the control group is those who are 3+ years prior to flag removal.

Figure 7: Impact of Flag Removal on Total Income (Labor Earnings plus Self-Employed Net Income), Among Those Who Transition into Formal Employment (Summed Coefficients Plotted from Col. (3), Table 13)



Notes: Coefficients from Col. (3), Table 13. We add the coefficients on the flag removal dummy (e.g. 2 Years Before Removal (d)), interaction term (e.g. 2 Years Before Removal (d) x Trans. Into Formal-Employed, 1k (d)) and the transition term (e.g. Transition Into Formal-Employed, 1k (d)), and we compute standard errors using the delta method. The points on the plotted line can be interpreted as the increase in total income from entering formal employment, relative to a non-transitioner in the control group.

Online Appendix, Not For Publication

"The Impact of Consumer Credit Access on Employment, Earnings and Entrepreneurship"

Kyle Herkenhoff, Gordon Phillips, and Ethan Cohen-Cole[26]

November 30, 2017

[26]Any opinions and conclusions expressed herein are those of the author(s) and do not necessarily represent the views of the U.S. Census Bureau. All results have been reviewed to ensure that no confidential information is disclosed. This research uses data from the Census Bureau's Longitudinal Employer Household Dynamics Program, which was partially supported by the following National Science Foundation Grants SES-9978093, SES-0339191 and ITR-0427889; National Institute on Aging Grant AG018854; and grants from the Alfred P. Sloan Foundation.

A Details on the Integrated Longitudinal Business Database (ILBD)

The ILBD merges two different databases. The first database is the Longitudinal Business Database (LBD) which tracks the universe of all U.S. establishments that have paid employees.[27] The second database is the universe of IRS non-employer tax records (i.e. those who fill out 1040 Schedule C tax returns). As soon as an entity hires a non-contractor, full-time employee, the business owner must obtain an EIN and will enter the LBD.[28] Davis et al. [2007] construct the ILBD using the SSN-EIN link found on the application for an EIN, and they also use exact business name matches. This yields a crosswalk between non-employers and the subsequent businesses they become.[29] We subsequently merge the ILBD using anonymized unique identifiers to our credit bureau data and the LEHD.

[27] "Overview: The Longitudinal Business Database (LBD) is a research dataset constructed at the Center for Economic Studies (CES) in the U.S. Census Bureau. The LBD contains the universe of all U.S. business establishments with paid employees listed in the Census Bureaus business register." http://maryannfeldman.web.unc.edu/data-sources/longitudinal-databases/longitudinal-business-database/

[28] According to the IRS, "As a business owner, when another person performs work for you, you must first correctly classify that person as an independent contractor or employee. If the person is an independent contractor, refer to Forms and Associated Taxes for Independent Contractors for your tax responsibilities. If the person is classified as an employee you must have an Employer Identification Number (EIN). Your tax responsibilities include withholding, depositing, reporting, and paying employment taxes. You must also give certain forms to your employees, they must give certain forms to you, and you must send certain forms to the IRS and SSA." https://www.irs.gov/businesses/small-businesses-self-employed/businesses-with-employees

[29] Quoting from Davis et al. [2007] "...we create a set of firm-level matches between employers and nonemployers for our selected industries. These matches rely on numeric identifiers and exact literal matches on business names. In matching on numeric identifiers, we exploit the fact that many business records contain both an EIN and an SSN. For example, when a business owner or officer applies for an EIN, he or she must fill out an SS-4 form for the IRS. This form includes the business name, the EIN and the SSN of the business owner or chief officer, all of which are included in Census Bureau business registers. These data allow us to build a crosswalk between EINs and SSNs, which we then use to match business records across universes... we rely only on the EIN-SSN crosswalk and exact literal matches on business name. As an example of how our matching algorithm works, consider all establishments with employees in our selected industries as of 2000. Using the longitudinal links in the LBD, we first create a set of identifiers (EINs, SSNs and business names) associated with each establishment with employees in 2000 for each year back to 1992... About 17 percent of our employer-nonemployer matches rely on exact literal matches on business name strings."

B Full Population Regression

Table A1 reports the full regression from Table 2, including the coefficients on the terms for the levels of credit and credit scores. The table also includes non-employment and dual employment measures. Self-employment and transitions into self employment increase as the marginal cost of $1 of credit declines (i.e. the bankruptcy score improves). Credit scores are an ordinal rank, and thus the deciles convey information about the ranking of marginal costs of funds, not the level. While revolving credit limits are typically populated in our dataset, the unused mortgage credit is defined as the highest mortgage balance observed less the current mortgage balance. Likewise, the unused non-mortgage and non-revolving credit corresponds to the highest non-mortgage and non-revolving debt observed less the current non-mortgage and non-revolving debt. The mortgage deciles 1 through 6 include those with a zero balance for their mortgage (roughly 40% of US households have a mortgage).

Table A1: Population Relationship Between Self/Formal Employment Outcomes and Credit Scores. (Source: 100% Sample).

	(1) Self Employed, 1k (d)	**(2)** Transition Into Self-Employed, 1k (d)	**(3)** Transition Out of Self-Employed, 1k (d)	**(4)** LBD Firm Ownership, 1+ Yrs	**(5)** LBD Firm Ownership, 2+ Yrs	**(6)** Formal Employed, 1k (d)	**(7)** Both Self and Formal Employed, 1k (d)	**(8)** Non-Employed, 1k (d)
Credit Score Decile 2	-0.000457	-0.000438	0.000149	-0.000106	-6.07e-05	-0.000490	-0.000163	0.000784*
	(0.000334)	(0.000270)	(0.000247)	(6.67e-05)	(5.28e-05)	(0.000429)	(0.000289)	(0.000431)
Credit Score Decile 3	0.000410	0.000435*	-0.000555**	-0.000172***	-0.000104**	-0.00308***	-8.04e-05	0.00258***
	(0.000322)	(0.000263)	(0.000240)	(6.50e-05)	(5.09e-05)	(0.000411)	(0.000277)	(0.000415)
Credit Score Decile 4	0.00127***	0.000921***	-0.000662***	-0.000180***	-0.000146***	-0.00454***	0.000276	0.00354***
	(0.000327)	(0.000264)	(0.000242)	(6.80e-05)	(5.38e-05)	(0.000411)	(0.000282)	(0.000416)
Credit Score Decile 5	0.00229***	0.00142***	-0.00155***	-0.000180**	-0.000114**	-0.00531***	0.000678**	0.00370***
	(0.000338)	(0.000271)	(0.000248)	(7.29e-05)	(5.79e-05)	(0.000421)	(0.000291)	(0.000426)
Credit Score Decile 6	0.00224***	0.00120***	-0.00158***	-0.000204***	-0.000108*	-0.00628***	0.000428	0.00447***
	(0.000354)	(0.000282)	(0.000258)	(7.71e-05)	(6.11e-05)	(0.000439)	(0.000305)	(0.000444)
Credit Score Decile 7	0.00225***	0.00159***	-0.00167***	-0.000213***	-0.000130**	-0.00765***	0.000275	0.00567***
	(0.000371)	(0.000295)	(0.000269)	(8.27e-05)	(6.58e-05)	(0.000458)	(0.000320)	(0.000464)
Credit Score Decile 8	0.00174***	0.00133***	-0.00194***	-0.000258***	-0.000165**	-0.00968***	-7.55e-05	0.00786***
	(0.000393)	(0.000311)	(0.000284)	(8.93e-05)	(7.17e-05)	(0.000483)	(0.000339)	(0.000489)
Credit Score Decile 9	0.00236***	0.00170***	-0.00254***	-0.000189*	1.42e-05	-0.0119***	3.00e-05	0.00959***
	(0.000428)	(0.000337)	(0.000307)	(0.000101)	(8.20e-05)	(0.000521)	(0.000370)	(0.000529)
Credit Score Decile 10	0.000791*	0.000604*	-0.00243***	-0.000288***	-0.000214***	-0.0120***	-0.000537	0.0107***
	(0.000446)	(0.000348)	(0.000314)	(0.000100)	(8.14e-05)	(0.000562)	(0.000382)	(0.000570)
Unused Revolving Credit Decile 3	0.00189***	0.00123***	-0.000176	0.000142***	7.78e-05**	-0.00179***	0.000472*	0.000371
	(0.000299)	(0.000249)	(0.000222)	(5.13e-05)	(3.89e-05)	(0.000380)	(0.000261)	(0.000383)
Unused Revolving Credit Decile 4	0.00229***	0.00150***	-9.31e-05	0.000182***	0.000128***	-0.00290***	0.000568**	0.00119***
	(0.000286)	(0.000232)	(0.000208)	(5.49e-05)	(4.21e-05)	(0.000359)	(0.000246)	(0.000363)
Unused Revolving Credit Decile 5	0.00375***	0.00292***	0.000178	0.000216***	0.000163***	-0.00362***	0.00133***	0.00120***
	(0.000310)	(0.000249)	(0.000224)	(6.25e-05)	(4.94e-05)	(0.000384)	(0.000267)	(0.000388)
Unused Revolving Credit Decile 6	0.00517***	0.00364***	-0.000279	0.000233***	0.000110**	-0.00393***	0.00206***	0.000830**
	(0.000336)	(0.000266)	(0.000240)	(7.03e-05)	(5.56e-05)	(0.000411)	(0.000290)	(0.000416)
Unused Revolving Credit Decile 7	0.00619***	0.00462***	2.46e-05	0.000279***	0.000148**	-0.00507***	0.00208***	0.000963**
	(0.000366)	(0.000287)	(0.000259)	(7.89e-05)	(6.31e-05)	(0.000441)	(0.000315)	(0.000446)
Unused Revolving Credit Decile 8	0.00770***	0.00608***	0.000371	0.000212**	0.000163**	-0.00599***	0.00280***	0.00110**
	(0.000408)	(0.000315)	(0.000286)	(9.20e-05)	(7.47e-05)	(0.000486)	(0.000352)	(0.000493)
Unused Revolving Credit Decile 9	0.0101***	0.00806***	-0.000126	0.000340***	0.000156*	-0.00812***	0.00346***	0.00146***
	(0.000470)	(0.000358)	(0.000325)	(0.000112)	(9.15e-05)	(0.000550)	(0.000406)	(0.000559)
Unused Revolving Credit Decile 10	0.0109***	0.00907***	-6.03e-05	0.000732***	0.000458***	-0.0116***	0.00336***	0.00404***
	(0.000569)	(0.000429)	(0.000392)	(0.000149)	(0.000123)	(0.000649)	(0.000493)	(0.000663)
Unused Mortgage Credit Decile 7	0.00325***	0.00153***	0.000244	0.000141**	9.39e-05*	-0.00347***	0.00180***	0.00203***
	(0.000277)	(0.000224)	(0.000203)	(6.25e-05)	(4.94e-05)	(0.000305)	(0.000245)	(0.000310)
Unused Mortgage Credit Decile 8	0.00339***	0.00179***	0.000319	0.000176***	0.000134**	-0.00378***	0.00177***	0.00215***
	(0.000276)	(0.000219)	(0.000200)	(6.52e-05)	(5.24e-05)	(0.000307)	(0.000244)	(0.000312)
Unused Mortgage Credit Decile 9	0.00335***	0.00164***	0.000277	0.000311***	0.000145**	-0.00542***	0.00158***	0.00365***
	(0.000302)	(0.000232)	(0.000215)	(7.60e-05)	(6.21e-05)	(0.000337)	(0.000265)	(0.000344)
Unused Mortgage Credit Decile 10	0.000795**	0.000995***	0.000751***	0.000240**	0.000163*	-0.00773***	0.000308	0.00724***
	(0.000362)	(0.000272)	(0.000255)	(0.000105)	(8.72e-05)	(0.000401)	(0.000313)	(0.000416)
Unused Non-Mortgage and Non-Revolving Credit Decile 4	0.000900***	0.000651***	0.000160	-8.77e-05	-0.000122***	0.000206	8.85e-05	-0.00102***
	(0.000270)	(0.000225)	(0.000205)	(6.03e-05)	(4.75e-05)	(0.000332)	(0.000232)	(0.000339)
Unused Non-Mortgage and Non-Revolving Credit Decile 5	0.00149***	0.00127***	8.63e-05	-4.98e-05	-5.15e-05	-0.000848***	0.000120	-0.000520*
	(0.000239)	(0.000198)	(0.000177)	(4.73e-05)	(3.73e-05)	(0.000297)	(0.000208)	(0.000300)
Unused Non-Mortgage and Non-Revolving Credit Decile 6	0.00196***	0.00188***	0.000152	-3.74e-05	-3.70e-05	-0.00110***	0.000310	-0.000544*
	(0.000245)	(0.000200)	(0.000180)	(5.08e-05)	(4.00e-05)	(0.000298)	(0.000213)	(0.000301)
Unused Non-Mortgage and Non-Revolving Credit Decile 7	0.00245***	0.00220***	0.000135	2.50e-05	1.84e-06	-0.000635**	0.000634***	-0.00118***
	(0.000252)	(0.000204)	(0.000184)	(5.45e-05)	(4.32e-05)	(0.000302)	(0.000220)	(0.000306)
Unused Non-Mortgage and Non-Revolving Credit Decile 8	0.00285***	0.00283***	0.000260	9.12e-06	6.53e-06	-0.000193	0.000927***	-0.00173***
	(0.000262)	(0.000209)	(0.000190)	(5.84e-05)	(4.69e-05)	(0.000309)	(0.000228)	(0.000312)
Unused Non-Mortgage and Non-Revolving Credit Decile 9	0.00248***	0.00271***	0.000571***	5.47e-05	5.71e-05	0.000261	0.000380	-0.00236***
	(0.000275)	(0.000217)	(0.000199)	(6.49e-05)	(5.24e-05)	(0.000319)	(0.000240)	(0.000324)
Unused Non-Mortgage and Non-Revolving Credit Decile 10	0.00228***	0.00295***	0.000193	0.000407***	0.000276***	-0.000848**	0.000386	-0.00104***
	(0.000319)	(0.000246)	(0.000228)	(8.81e-05)	(7.30e-05)	(0.000353)	(0.000277)	(0.000363)
Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y
Controls	Y	Y	Y	Y	Y	Y	Y	Y
R-squared	0.019	0.061	0.074	0.002	0.001	0.170	0.005	0.140
Individuals (millions)	3.06	3.06	3.06	3.06	3.06	3.06	3.06	3.06
Total Person-Year Obs. (millions)	16.40	16.40	16.40	16.40	16.40	16.40	16.40	16.40

*Notes: SE in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Controls include: lagged labor earnings and self-employed income, deciles of cumulative lagged earnings dummies, quadratics in age and tenure. Fixed effects include individual fixed effects and year dummies.*

C Alternate Clustered Standard Errors

To address concerns about potential cohort and regional labor market effects, we cluster standard errors in this section at the cohort by zipcode level. Table A2 includes results for our main stock and flow results. Columns (2) and (3) show that the main results about offsetting self-employment flows persist, and Column (4) shows that the rise in formal employment remains highly significant. Column (5) shows that firm ownership, measured as 2+ years of consecutive ownership, still increases significantly following flag removal. Table A3 includes the main transition results, and again Column (1) shows that those who transition into self employment are much more likely to hire their first employee after flag removal, Column (2) shows that self-employment entrants earn more after flag removal, and Column (3) through (5) show that they borrow significantly more.

Table A2: Main Results with Clustered Standard Errors at the Cohort × Zip level.

	(1) Self-Employed (d)	(2) Transition into Self-Employed, 1k (d)	(3) Transition out of Self-Employed, 1k (d)	(4) Formal Employed, 1k (d)	(5) LBD Firm Ownership 2+ Years, (d)
2 Years Before Removal (d)	0.000600	0.000527	0.000898*	0.000308	1.30e-05
	(0.000701)	(0.000575)	(0.000538)	(0.000907)	(0.000110)
1 Year Before Removal (d)	-0.000384	2.64e-05	0.00137**	0.00154	0.000113
	(0.000902)	(0.000635)	(0.000599)	(0.00123)	(0.000148)
Year of Removal (d)	0.000950	0.00161**	0.00169**	0.00289*	0.000394**
	(0.00112)	(0.000747)	(0.000692)	(0.00152)	(0.000191)
1+ Years After Removal (d)	0.00108	0.000649	0.00222***	0.00465**	0.000540**
	(0.00138)	(0.000895)	(0.000838)	(0.00188)	(0.000230)
Individual Fixed Effects	Y	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y	Y
Age and Tenure Controls	Y	Y	Y	Y	Y
R-squared	0.003	0.000	0.001	0.122	0.000
Round N	1.500e+06	1.500e+06	1.500e+06	1.500e+06	1.500e+06
N Indiv	220000	220000	220000	220000	220000

Table A3: Main Transition Results with Clustered Standard Errors at the Cohort × Zip level.

	(1) LBD Firm Ownership 2+ Years (d)	(2) Real Self-Employed Net Income	(3) Real Revolving Balance	(4) Real Mortgage Balance	(5) Real HELOC Balance
2 Years Before Removal (d)	-8.93e-05	-47.61**	1,112***	6,023***	759.8***
	(9.36e-05)	(20.20)	(47.48)	(399.1)	(54.12)
1 Year Before Removal (d)	-2.84e-05	-78.49***	1,793***	8,957***	1,377***
	(0.000132)	(27.88)	(67.34)	(565.9)	(77.29)
Year of Removal (d)	0.000145	-101.3***	2,735***	10,387***	1,978***
	(0.000171)	(34.95)	(87.44)	(728.6)	(98.91)
1+ Years After Removal (d)	0.000204	-158.2***	4,257***	8,084***	3,551***
	(0.000223)	(43.89)	(99.49)	(888.2)	(114.8)
Transition Into Self-Employed (d)	0.00936***	8,522***	-461.9***	-5,635***	-486.9***
	(0.000702)	(123.7)	(76.57)	(745.7)	(87.98)
2 Yrs. Before Removal (d) x Trans Into Self-Employed, 1k (d)	0.00312*	2,274***	298.4	5,642***	277.8
	(0.00162)	(269.9)	(223.7)	(1,833)	(276.9)
1 Yr. Before Removal (d) x Trans Into Self-Employed, 1k (d)	0.00451***	2,185***	822.2***	10,086***	575.8*
	(0.00172)	(273.4)	(254.7)	(1,850)	(297.3)
Yr. of Removal (d) x Trans Into Self-Employed, 1k (d)	0.00694***	2,704***	598.9**	7,348***	640.2*
	(0.00192)	(297.9)	(272.0)	(2,034)	(330.3)
1+ Yrs. After Removal (d) x Trans Into Self-Employed, 1k (d)	0.00979***	3,376***	1,610***	13,714***	1,253***
	(0.00145)	(214.0)	(211.2)	(1,502)	(268.5)
Individual Fixed Effects	Y	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y	Y
Age and Tenure Controls	Y	Y	Y	Y	Y
R-squared	0.006	0.077	0.050	0.092	0.026
Round N	1.500e+06	1.500e+06	1.500e+06	1.500e+06	1.500e+06
N Indiv	220000	220000	220000	220000	220000

D TransUnion/LEHD Additional Results: Levels of Non-Employment

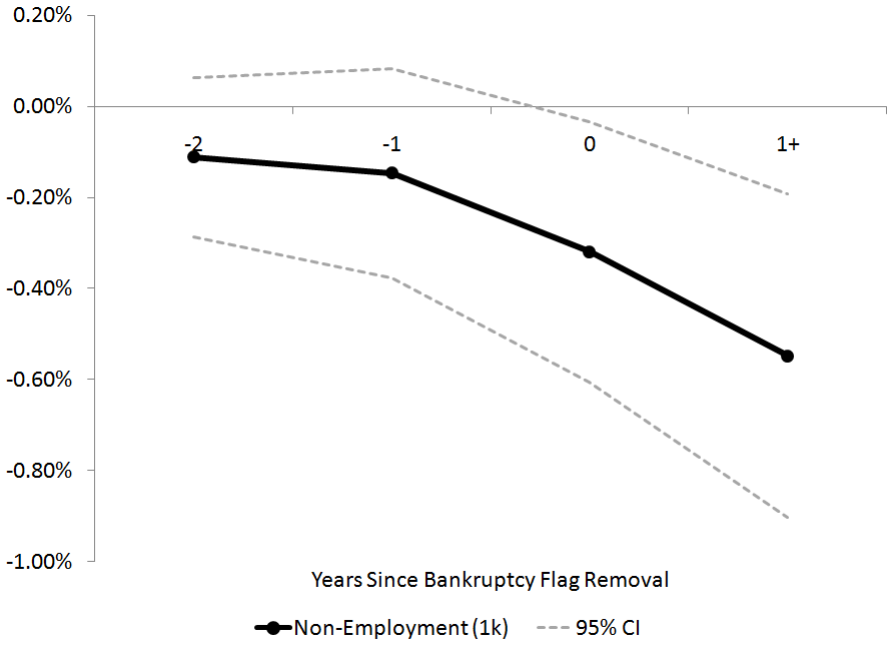
Table A4 illustrates the impact of bankruptcy flag removal on non-employment, defined to be those who are not formal-employed and are also not self employed. Column (1) of Table A4 shows that non-employment (using a $1k earnings threshold) declines by .548% following bankruptcy flag removal, relative to the control group. In this case, we can reject equality of coefficients on the dummy one year prior to flag removal and one year following flag removal. Figure 8 plots the coefficients from Column (1). The figure shows a stable trend in non-employment prior to flag removal and then a rapid decline in non-employment following flag removal. Column (2) of Table A4 illustrates a similar pattern using the $5k definitions of formal employment and self employment.

Table A4: Baseline Non-Employment Results

	(1) Non-Employed, 1k (d)	**(2)** Non-Employed, 5k (d)
2 Years Before Removal (d)	-0.00112	-0.000723
	(0.000887)	(0.000914)
1 Year Before Removal (d)	-0.00147	-0.00101
	(0.00117)	(0.00120)
Year of Removal (d)	-0.00320**	-0.00278*
	(0.00146)	(0.00150)
1+ Years After Removal (d)	-0.00548***	-0.00354*
	(0.00181)	(0.00185)
Individual Fixed Effects	Y	Y
Year Fixed Effects	Y	Y
Age and Tenure Controls	Y	Y
R-squared	0.096	0.098
Indiv-Yr Obs.	1.500e+06	1.500e+06
No. of Indiv.	220000	220000
Sig Diff 1+Yr & -2Yr at 10%	Y	Y
Sig Diff 0Yr & -2Yr at 10%	Y	Y

*Notes: SE in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Age and Tenure controls include quadratics in age and tenure. The symbol (d) indicates a dummy variable. Non-employment (d) is a dummy which equals one when individuals are simultaneously not formal-employed and not self employed. For formal employment and self-employment definitions, see Section 1.1.*

Figure 8: Non-employment (Coefficients Plotted from Table A4, Column (1))



E TransUnion/LEHD Additional Results: Transitions from Self-Employment to Formal Employment and Vice Versa

Table A5 includes the transition rates between self employment and formal employment, as well as the incidence of dual jobs and single jobs. To reduce noise we require the individual to be in their previous sector for at least 2 years before the transitioning. Column (1) illustrates an insignificant increase in the transition rate from formal employment to self employment. Column (2) illustrates an increase in the transition rate from self employment to formal employment of .171% following flag removal; however, the transition rate moves prior to the flag removal. Column (3) shows that odds of being both formally employed and self employed increases following flag removal, but insignificantly. Likewise Column (3) shows that the odds of being only self employed are hardly affected by flag removal. But Column (4) shows that the odds of being solely employed in a formal sector job increases by .44% following flag removal. This suggests that individuals are finding formal-sector jobs that allow them to quit their self-employed jobs.

Table A5: Transitions from Self-Employment to Formal Employment

	(1) Transition from Formal-Employed (2yr) to Self-Employment, 1k (d)	**(2)** Transitions from Self-Employed (2yr) to Formal-Employed, 1k (d)	**(3)** Both SE and Formal-Employed (d)	**(4)** Only Self-employed (d)	**(5)** Only Formal-Employed (d)
2 Years Before Removal (d)	0.000173	0.000244	-0.000208	0.000808*	0.000516
	(0.000614)	(0.000322)	(0.000636)	(0.000426)	(0.00102)
1 Year Before Removal (d)	0.000555	0.00114***	-0.000309	-7.45e-05	0.00185
	(0.000756)	(0.000418)	(0.000807)	(0.000545)	(0.00134)
Year of Removal (d)	0.00126	0.00126**	0.000632	0.000318	0.00225
	(0.000909)	(0.000506)	(0.000990)	(0.000677)	(0.00166)
1+ Years After Removal (d)	0.00137	0.00171***	0.000247	0.000830	0.00441**
	(0.00110)	(0.000619)	(0.00121)	(0.000832)	(0.00205)
Individual Fixed Effects	Y	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y	Y
Age and Tenure Controls	Y	Y	Y	Y	Y
R-squared	0.000	0.002	0.003	0.013	0.083
No. Person-Yr Obs.	1.500e+06	1.500e+06	1.500e+06	1.500e+06	1.500e+06
No. of Indiv.	220000	220000	220000	220000	220000

*Notes: SE in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Age and Tenure controls include quadratics in age and tenure. Fixed Effects include individual fixed effects and year dummies.*

F TransUnion/LEHD Additional Results: LBD Pay and Employment

Finally, Table A6 illustrates the impact of bankruptcy flag removal on payroll (in thousands of 2008 dollars) and employment for LBD firm owners. Column (1) of Table A6 shows that there is an increase in both LBD payrolls of $2.9k following flag removal among LBD firm owners, however this increase is insignificant at standard levels. Column (2) of Table A6 shows that there is an increase in employment of .66 employees (i.e. 2/3 of an employee on average) following flag removal among LBD firm owners, but again, this increase is insignificant. As we mentioned in the main text, the lack of power is presumably from the small fraction of bankrupt individuals who own employer-firms in the LBD, and in future research, we plan to explore the impact of credit access on hiring patterns in more detail with a broader sample of firm owners.

Table A6: LBD Employment and Pay

	(1) LBD Pay	**(2)** LBD Employment
2 Years Before Removal (d)	0.105	0.00251
	(0.118)	(0.00378)
1 Year Before Removal (d)	0.127	0.00240
	(0.197)	(0.00476)
Year of Removal (d)	0.242	0.00304
	(0.207)	(0.00617)
1+ Years After Removal (d)	0.163	0.00123
	(0.278)	(0.00642)
LBD Ownership, 2+ Yrs. (d)	-9.136***	-0.316
	(3.181)	(0.266)
2 Yrs. Before Removal (d) x LBD Ownership, 2+ Yrs. (d)	11.24	-0.635
	(12.12)	(0.564)
1 Yr. Before Removal (d) x LBD Ownership, 2+ Yrs. (d)	7.121	-0.673
	(6.496)	(0.704)
Yr. of Removal (d) x LBD Ownership, 2+ Yrs. (d)	17.20	-0.328
	(12.90)	(0.637)
1+ Yrs. After Removal (d) x LBD Ownership, 2+ Yrs. (d)	14.12	0.0269
	(12.54)	(0.302)
Individual Fixed Effects	Y	Y
Year Fixed Effects	Y	Y
Age and Tenure Controls	Y	Y
R-squared	0.000	0.000
No. Person-Yr Obs.	1.500e+06	1.500e+06
No. of Indiv.	220000	220000
Combined Coeff Diff 1+ Yrs & -2 Yrs	2.94	0.66
Combined Coeff Diff Sig at 10%	N	N

*Notes: SE in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Age and Tenure controls include quadratics in age and tenure. Fixed Effects include individual fixed effects and year dummies. LBD Pay measures the total payroll of the firm and is expressed in thousands of 2008 dollars. LBD employment refers to the number of workers employed at the firm.*

G TransUnion/LEHD Additional Results: Formal Sector Exit Rates and Job Turnover

Are those who transition into formal employment marginal workers? To explore this question, we compute rates at which workers transit out of formal employment for those who find a new job after flag removal. In general, these newly employed workers are attached to the formal sector and are less likely to exit after flag removal. Table A7 illustrates job transitions among those who recently found a job. Column (1) of Table A7 shows that among those who transition into formal employment following flag removal, their odds of exiting formal employment in the following year actually declines slightly. Column (1) shows that individuals who transition into formal employment 1 or more years after bankruptcy flag removal are -.76% (= (-.0267+.0047)- (-.0153+.0009)) less likely to subsequently exit formal sector employment than individuals who transition into formal employment 2 years prior to bankruptcy flag removal. We find a similar result using the $5k cutoff in Column (2). Column (3) shows that individuals who transition into formal employment 1 or more years after bankruptcy flag removal are 2.96% (= (.0526-.0009)- (.0226-.0005)) more likely to start a new formal sector job than individuals who transition into formal employment 2 years prior to bankruptcy flag removal. The increased odds of switching to a new employer may reflect either (i) increased odds of being laid off, or (ii) climbing the job ladder. The persistent wage gains point to the latter explanation, but since the LEHD does not provide reason of separation, we leave this to future research.

Table A7: Transitions Out of Formal Sector Employment and Between Employers

	(1) Transition out of Formal Empl. Next Year, 1k (d)	**(2)** Transition out of Formal Empl. Next Year, 5k (d)	**(3)** New Formal Job Accession Next Year (d)
2 Years Before Removal (d)	0.000963	0.000921	-0.000513
	(0.000669)	(0.000699)	(0.00122)
1 Year Before Removal (d)	0.00150**	0.00178**	-0.000469
	(0.000759)	(0.000785)	(0.00141)
Year of Removal (d)	0.00266***	0.00275***	-0.00112
	(0.000893)	(0.000917)	(0.00165)
1+ Years After Removal (d)	0.00476***	0.00408***	-0.000948
	(0.00109)	(0.00111)	(0.00201)
Transition into Formal-Employed, 1k (d)	0.109***	0.0534***	0.00822***
	(0.00227)	(0.00192)	(0.00259)
2 Yrs. Before Removal (d) x Trans into Formal-Employed, 1k (d)	-0.0153***	-0.00924**	0.0226***
	(0.00501)	(0.00428)	(0.00574)
1 Yr. Before Removal (d) x Trans into Formal-Employed, 1k (d)	-0.0150***	-0.00822*	0.0213***
	(0.00503)	(0.00429)	(0.00571)
Yr. of Removal (d) x Trans into Formal-Employed, 1k (d)	-0.0203***	-0.00334	0.0186***
	(0.00547)	(0.00475)	(0.00626)
1+ Yrs. After Removal (d) x Trans into Formal-Employed, 1k (d)	-0.0267***	-0.0187***	0.0526***
	(0.00389)	(0.00330)	(0.00446)
Individual Fixed Effects	Y	Y	Y
Year Fixed Effects	Y	Y	Y
Age and Tenure Controls	Y	Y	Y
R-squared	0.043	0.037	0.011
No. Person-Yr Obs.	1.500e+06	1.500e+06	1.500e+06
No. of Indiv.	220000	220000	220000
Combined Coeff Diff 1+ Yrs & -2 Yrs	-0.76%	-0.63%	2.96%
Combined Coeff Diff Sig at 10%	N	N	Y

*Notes: SE in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Age and Tenure controls include quadratics in age and tenure. Transition out of Formal Empl. Next Year, 1k (d) is a dummy that takes the value 1 if the individual earned at least $1k in the formal sector this year, and less than $1k next year. New Formal Job Accession Next Year (d) is a dummy that takes the value 1 if the individual becomes end-of-quarter employed at an SEIN they have never worked at previously.*

H TransUnion/LEHD Additional Results: Tests for Selection Among Self-Employed Transitioners

In this appendix, we discuss the role of selection for the transition results. Since flag removal is forseeable, there is concern that better entrepreneurs who anticipate the need for credit deliberately wait until the flag is removed to start a business. However, such selection still suggests credit plays an important role for business startups. Nonetheless, we show that the entrepreneurs who transition into self employment following flag removal are very close in terms of 1, 2, and 3 year lags of annual labor earnings relative to those who flow into self employment 1 or 2 years prior to flag removal. This set of results suggests that the new self-employed individuals have similar labor productivity. We repeat the same exercise using 1, 2, and 3 year lags of annual self-employed income. The idea is that if these were repeat entrepreneurs as in Gompers et al. [2006], then we should see non-zero or greater lagged self-employed income. Again we find that those who transition into self employment have very similar levels of previous self-employed earnings (i.e. they are not people who have previously failed disproportionately or succeeded disproportionately at entrepreneurship in the past). This suggests that they have similar prior levels of entrepreneurial talent. However, we cannot definitively rule out differences in unobserved talent.

Table A8 provides baseline regressions. Columns (1) through (3) regress lagged labor earnings on the self-employment transition indicator interacted with the window of dummies around flag removal. Columns (4) through (6) regress lagged self-employed income on an indicator interacted with the window of dummies around flag removal. To interpret the coefficients and test for selection, Table A9 tests whether those who transition into self employment in the year of flag removal differ from those who transition into self employment 1 and 2 years before flag removal. For example, the upper left hand cell of Table A8 computes prior labor earnings of those transitioning into self employment in the year of removal \$552 (= -120.5+1731 -1058) less the prior labor earnings of those transitioning into self employment 1 year before flag removal \$944 (=-36.63+1731 -749.7) to arrive at a difference in prior labor earnings between these two cohorts of self-employed individuals of \$-391.9 (=-36.63+1,731 -749.7 -(-120.5+1,731 -1,058)). The standard error of this difference in prior labor earnings is \$353, and the corresponding test statistic is -1.11, indicating that there is no difference in prior labor earnings between those who transition into self employment one year before flag removal to one year after flag removal. The right-hand panel of Table A9 conduct the same

Table A8: Measures of selection for those who transition into self employment. Regressions of past labor earnings and self-employed earnings on transition dummies.

	(1)	(2)	(3)	(4)	(5)	(6)
	1 Year Lagged Labor Earnings	2 Year Lagged Labor Earnings	3 Year Lagged Labor Earnings	1 Year Lagged Self Employed Income	2 Year Lagged Self Employed Income	3 Year Lagged Self Employed Income
2 Years Before Removal (d)	42.06	110.4**	283.2***	40.16*	-12.00	15.14
	(43.19)	(45.68)	(46.65)	(21.50)	(21.71)	(21.50)
1 Year Before Removal (d)	-36.63	86.06	279.4***	36.16	7.120	35.83
	(58.90)	(62.34)	(64.85)	(29.28)	(28.82)	(28.62)
Year of Removal (d)	-120.5	24.97	348.5***	19.74	31.14	70.09**
	(74.07)	(78.21)	(82.17)	(36.79)	(36.17)	(35.66)
1+ Years After Removal (d)	-469.6***	-291.8***	178.6*	15.44	-3.157	89.44**
	(91.25)	(96.37)	(101.6)	(45.19)	(44.66)	(44.55)
Transition Into Self-Employed (d)	1,731***	1,934***	1,507***	-8,960***	-3,902***	-2,516***
	(118.6)	(120.7)	(121.1)	(94.26)	(87.84)	(78.77)
2 Yrs. Before Removal (d) x Trans Into Self-Employed, 1k (d)	-462.9*	-422.4	-582.9**	655.1***	1,152***	1,113***
	(271.2)	(277.0)	(281.8)	(184.4)	(196.8)	(182.1)
1 Yr. Before Removal (d) x Trans Into Self-Employed, 1k (d)	-749.7***	-721.5**	-483.8*	516.7***	1,477***	760.6***
	(270.3)	(288.2)	(289.8)	(184.5)	(202.4)	(183.2)
Yr. of Removal (d) x Trans Into Self-Employed, 1k (d)	-1,058***	-418.2	-1.496	847.6***	1,102***	1,178***
	(286.8)	(298.9)	(292.7)	(191.7)	(201.4)	(192.1)
1+ Yrs. After Removal (d) x Trans Into Self-Employed, 1k (d)	-1,655***	-1,430***	-1,182***	1,802***	2,623***	2,382***
	(209.6)	(216.6)	(213.9)	(147.0)	(150.5)	(141.5)
Individual Fixed Effects	Y	Y	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y	Y	Y
Age and Tenure Controls	Y	Y	Y	Y	Y	Y
R-squared	0.181	0.082	0.040	0.055	0.010	0.005
Round N	1.500e+06	1.500e+06	1.500e+06	1.500e+06	1.500e+06	1.500e+06
N Indiv	220000	220000	220000	220000	220000	220000

*Notes: *** p<0.01, ** p<0.05, * p<0.1. Age and Tenure controls include quadratics in age and tenure.*

exercise using self-employed earnings. Again, in all but one specification, we fail to reject that those who waited to start a business after flag removal had any difference in prior self-employment earnings to those who started their business one year before removal. Table A10 conducts the same exercise for longer lags of self-employed income, from 7 to 12 years, which includes the period before entering bankruptcy (earnings data is not available at these longer horizons). Again, the sample passes the selection tests in all but one specification, indicating that the people who wait to start a business are not necessarily repeat entrepreneurs who had higher income 7 to 12 years ago before entering bankruptcy.

Table A9: Measures of selection for those who transition into self employment. Comparison of past labor earnings and past self-employed net income between those who transit into self employment 1 and 2 years before flag removal versus those who transition into self employment in the year of flag removal

	Difference in Labor Earnings X years ago between those who become SE 1 year before flag removal vs. those who wait until year of flag removal				**Difference in Self-Employed net income X years ago between those who become SE 1 year before flag removal vs. those who wait until year of flag removal**		
X=	**1 Year**	**2 Years**	**3 Years**		**1 Year**	**2 Years**	**3 Years**
Difference Labor Earnings	-391.9	242.1	551.4	Difference in Net Income	314.4	-350.5	451.9*
Std. Error	353.7	376.1	371.3	Std. Error	241.3	256.9	240.3
T-stat	**-1.11**	**0.64**	**1.49**	**T-stat**	**1.30**	**-1.36**	**1.88**
	Difference in Labor Earnings X years ago between those who become SE 2 years before flag removal vs. those who wait until year of flag removal				**Difference in Self-Employed net income X years ago between those who become Self-Employed 2 years before flag removal vs. those who wait until year of flag removal**		
X=	**1 Year**	**2 Years**	**3 Years**		**1 Year**	**2 Years**	**3 Years**
Difference in Labor Earnings	-757.5**	-81.29	646.7*	Difference in Net Income	172.1	-6.9	120.6
Std. Error	355.7	365.6	362.8	Std. Error	231.5	252.6	237.2
T-stat	**-2.13**	**-0.22**	**1.78**	**T-stat**	**0.74**	**-0.03**	**0.51**

*Notes: *** p<0.01, ** p<0.05, * p<0.1. Estimates based on Table A8 and calculations are explained in detail in the text.*

Table A10: Measures of selection for those who transition into self employment. Comparison of 7 to 12 year lagged self-employed net income between those who transit into self employment 1 and 2 years before flag removal versus those who transition into self employment in the year of flag removal

	Difference in Self-Employed net income X years ago between those who become Self-Employed 2 years before flag removal vs. those who wait until year of flag removal					
X=	**7 Years**	**8 Years**	**9 Years**	**10 Years**	**11 Years**	**12 Years**
Difference in Net Income	-282.6	581.2	35.5	273.3	497.4	319.9
Std. Error	458.8	482.3	480.4	569.2	590.0	363.8
T-stat	**-0.62**	**1.21**	**0.07**	**0.48**	**0.84**	**0.88**
	Difference in Self-Employed net income X years ago between those who become SE 1 year before flag removal vs. those who wait until year of flag removal					
X=	**7 Years**	**8 Years**	**9 Years**	**10 Years**	**11 Years**	**12 Years**
Difference in Net Income	-139.6	-1264	936.9	-831.5	727.1	-339.3
Std. Error	509.1	1178	470.8	754	551.6	416.6
T-stat	**-0.27**	**-1.07**	**1.99**	**-1.10**	**1.32**	**-0.81**

*Notes: *** p<0.01, ** p<0.05, * p<0.1.*

I TransUnion/LEHD Additional Results: Alternate Selection Correction, Inverse Mills Ratios

In this section, we apply the heckit selection correction. We predict the odds that an individual transitions into self employment using a probit regression with controls for cumulative lagged earnings, an equity proxy, quadratics in age and tenure, race dummies, sex, education dummies, mortgage and auto loan indicators. We then use the predicted probability of selecting into entrepreneurship to construct the inverse mills ratio. We then control for the inverse mills ratio in all of our subsequent transition results. Table A11 illustrates that our main results are nearly identical, even after controlling for the ex-ante odds of making the subsequent transition into self and formal employment, respectively. The inverse mills ratios do enter with significant coefficients, but the point estimates for our main results are extremely similar to the main tables in the text.

J TransUnion/LEHD Additional Results: Industry Results

Table A12 describes the sector in which individuals enter self employment, and Table A13 describes the sector in which individuals enter formal employment. Industries are defined using 1 digit SIC classifications of the self-employment industry or the individual's primary employer. Among new entrants to self employment, they are more likely to enter manufacturing, telecom, and retail. There is no differential impact of flag removal on services and finance startups, which are relatively less capital intensive than manufacturing or communications/transport startups and also rely less on external finance (Rajan and Zingales [1996]).

Table A13 shows that new formal-employment entrants are disproportionately more likely to work in the retail and service sector. Both sectors potentially require the individual to operate a cash-register or handle money relative to manufacturing and communications/transport jobs. However, we see relatively moderate effects of flag removal on the propensity to find a finance job, and employment in the finance industry continues to trend down, significantly, even after flag removal among non-transitioners.

Table A11: Inverse Mills Selection Correction for Main Results. Columns (1) through (3) apply the heckit correction for self-employment transitions, and Columns (4) through (6) apply the heckit correction for formal-employment transitions

	(1)	(2)	(3)	(4)	(5)	(6)
	Labor Earnings	Real Income	Total Earnings	Labor Earnings	Real Income	Total Earnings
Inverse Mills for Self-Employment Transition	30,957***	-4,797***	26,160***			
	(725.6)	(319.9)	(763.5)			
Inverse Mills for Formal Employment Transition				-18,625***	1,864***	-16,760***
				(211.4)	(95.75)	(223.0)
2 Years Before Removal (d)	37.26	-54.32***	-17.06	10.96	29.79	40.75
	(44.80)	(20.09)	(47.39)	(44.62)	(22.45)	(47.95)
1 Year Before Removal (d)	-31.61	-90.86***	-122.5*	-71.40	-5.213	-76.61
	(61.80)	(27.72)	(65.20)	(61.69)	(29.40)	(65.45)
Year of Removal (d)	-96.70	-118.2***	-214.9***	-132.7*	-14.30	-147.0*
	(77.90)	(34.63)	(81.99)	(77.84)	(36.78)	(82.37)
1+ Years After Removal (d)	-456.4***	-181.0***	-637.3***	-447.2***	-63.65	-510.9***
	(96.16)	(43.55)	(101.3)	(96.12)	(44.82)	(101.5)
Transition Into Self-Employed (d)	-1,527***	8,525***	6,998***			
	(116.2)	(123.3)	(154.0)			
2 Yrs. Before Removal (d) x Trans Into Self-Empl., 1k (d)	-611.5**	2,269***	1,657***			
	(272.5)	(268.1)	(345.2)			
1 Yr. Before Removal (d) x Trans Into Self-Empl., 1k (d)	-1,066***	2,174***	1,108***			
	(271.9)	(274.7)	(346.2)			
Yr. of Removal (d) x Trans Into Self-Empl., 1k (d)	-1,443***	2,690***	1,247***			
	(293.0)	(297.6)	(375.4)			
1+ Yrs. After Removal (d) x Trans Into Self-Empl., 1k (d)	-1,572***	3,355***	1,783***			
	(214.7)	(212.7)	(272.8)			
Transition Into Formal-Employed (d)				2,920***	-356.9***	2,563***
				(90.93)	(47.37)	(98.00)
2 Yrs. Before Removal (d) x Trans Into Formal-Employed, 1k (d)				787.4***	-182.7*	604.8***
				(205.0)	(110.8)	(223.9)
1 Yr. Before Removal (d) x Trans Into Formal-Employed, 1k (d)				1,284***	-382.0***	902.4***
				(212.6)	(117.5)	(233.6)
Yr. of Removal (d) x Trans Into Formal-Employed, 1k (d)				1,700***	-40.95	1,659***
				(234.1)	(131.0)	(257.0)
1+ Yrs. After Removal (d) x Trans Into Formal-Employed, 1k (d)				2,397***	-143.5	2,253***
				(168.1)	(91.44)	(184.2)
Individual Fixed Effects	Y	Y	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y	Y	Y
Age and Tenure Controls	Y	Y	Y	Y	Y	Y
R-squared	0.125	0.077	0.108	0.142	0.004	0.112
Round N	1.500e+06	1.500e+06	1.500e+06	1.500e+06	1.500e+06	1.500e+06
N Indiv	220000	220000	220000	220000	220000	220000

*Notes: *** p<0.01, ** p<0.05, * p<0.1. Inverse mills ratio constructed with first-stage probit that includes controls for cumulative lagged earnings, an equity proxy, quadratics in age and tenure, race dummies, sex, education dummies, mortgage and auto loan indicators*

Table A12: Sectoral Composition of Startups Among Newly Self-Employed Individuals. Dependent variable is dummy which equals one if the individual is self employed in the sector at the top of the column.

	(1)	(2)	(3)	(4)	(5)
	Manufacturing	Finance	Comm/Transp.	Retail	Services
2 Years Before Removal (d)	-0.000313	-7.89e-05	-1.95e-05	-0.000683*	-7.34e-06
	(0.000226)	(0.000228)	(0.000263)	(0.000361)	(0.000293)
1 Year Before Removal (d)	-0.000541*	3.76e-05	-0.000197	-0.000861*	-5.80e-05
	(0.000315)	(0.000317)	(0.000360)	(0.000500)	(0.000396)
Year of Removal (d)	-0.000911**	-3.81e-05	-2.50e-05	-0.00115*	0.000451
	(0.000388)	(0.000395)	(0.000449)	(0.000621)	(0.000494)
1+ Years After Removal (d)	-0.000699	-0.000377	-0.000126	-0.00127	0.000338
	(0.000510)	(0.000516)	(0.000589)	(0.000795)	(0.000647)
Transition Into Self-Employed (d)	0.0950***	0.110***	0.131***	0.247***	0.145***
	(0.00206)	(0.00216)	(0.00237)	(0.00298)	(0.00247)
2 Yrs. Before Removal (d) x Trans Into Self-Employed, 1k (d)	0.00597	-0.00462	0.00285	0.0377***	-0.00218
	(0.00445)	(0.00457)	(0.00515)	(0.00656)	(0.00521)
1 Yr. Before Removal (d) x Trans Into Self-Employed, 1k (d)	0.00660	-0.00924**	0.000122	0.0377***	0.00554
	(0.00452)	(0.00458)	(0.00513)	(0.00662)	(0.00542)
Yr. of Removal (d) x Trans Into Self-Employed, 1k (d)	0.00556	-0.00124	0.00897	0.0285***	0.00549
	(0.00478)	(0.00495)	(0.00557)	(0.00689)	(0.00573)
1+ Yrs. After Removal (d) x Trans Into Self-Employed, 1k (d)	0.0114***	-0.00296	0.00923**	0.0601***	0.00496
	(0.00358)	(0.00363)	(0.00412)	(0.00525)	(0.00423)
Individual Fixed Effects	Y	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y	Y
Age and Tenure Controls	Y	Y	Y	Y	Y
R-squared	0.046	0.051	0.062	0.131	0.064
Round N	1.500e+06	1.500e+06	1.500e+06	1.500e+06	1.500e+06
N Indiv	220000	220000	220000	220000	220000

*Notes: *** p<0.01, ** p<0.05, * p<0.1. Industry classifications based on NAICS codes reported in the ILBD.*

Table A13: Sectoral Composition of Employment Among Newly Formal-Employed Individuals. Dependent variable is dummy which equals one if the individual is formal-employed in the sector at the top of the column.

	(1)	(2)	(3)	(4)	(5)
	Manufacturing	Finance	Comm/Transp.	Retail	Services
2 Years Before Removal (d)	-0.000533	-0.000463	-0.000177	-0.000451	0.000536
	(0.000510)	(0.000445)	(0.000353)	(0.000720)	(0.000908)
1 Year Before Removal (d)	-0.00161**	-0.00127**	3.00e-05	-6.75e-05	0.00140
	(0.000697)	(0.000606)	(0.000483)	(0.000974)	(0.00123)
Year of Removal (d)	-0.00163*	-0.00196***	-0.000400	0.000829	0.00274*
	(0.000872)	(0.000760)	(0.000604)	(0.00121)	(0.00153)
1+ Years After Removal (d)	-0.000264	-0.00339***	-0.000348	0.000468	0.00402**
	(0.00109)	(0.000943)	(0.000758)	(0.00153)	(0.00192)
Transition into Formal-Employed, 1k (d)	0.0256***	0.0353***	0.0177***	0.144***	0.271***
	(0.00112)	(0.00118)	(0.000859)	(0.00208)	(0.00247)
2 Yrs. Before Removal (d) x Trans into Formal-Employed, 1k (d)	0.0108***	0.00202	0.00391*	0.0127***	0.0259***
	(0.00263)	(0.00273)	(0.00207)	(0.00474)	(0.00561)
1 Yr. Before Removal (d) x Trans into Formal-Employed, 1k (d)	0.00887***	0.00567**	0.00434**	0.0133***	0.0195***
	(0.00265)	(0.00278)	(0.00211)	(0.00475)	(0.00562)
Yr. of Removal (d) x Trans into Formal-Employed, 1k (d)	0.00508*	0.00775**	0.00567**	0.0166***	0.0376***
	(0.00284)	(0.00303)	(0.00228)	(0.00521)	(0.00616)
1+ Yrs. After Removal (d) x Trans into Formal-Employed, 1k (d)	0.0161***	0.00933***	0.00718***	0.0293***	0.0515***
	(0.00210)	(0.00221)	(0.00163)	(0.00380)	(0.00449)
Individual Fixed Effects	Y	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y	Y
Age and Tenure Controls	Y	Y	Y	Y	Y
R-squared	0.016	0.007	0.005	0.032	0.066
Round N	1.500e+06	1.500e+06	1.500e+06	1.500e+06	1.500e+06
N Indiv	220000	220000	220000	220000	220000

*Notes: *** p<0.01, ** p<0.05, * p<0.1. Industry classifications based on NAICS codes reported in the ILBD.*

K Alternate Empirical Design: Non-Overlapping Treatment and Control Groups with Sample Window from 2001-2005

For robustness, we employ an alternate empirical strategy designed to address concerns about bankruptcy reform. We compare previously bankrupt individuals before and after the bankruptcy flag removal to a subset of individuals that **never** have their flags removed in our sample period, i.e. we implement a difference-in-difference analysis with non-overlapping treatment and control groups. In particular, our sample window is 2001-2005, and we always restrict our attention to 24-65 year olds. The two groups of individuals we compare are labeled the treatment group, for those whose bankruptcy flags are removed, and control group, for those whose bankruptcy flags are not removed.

- **Treatment Group:** Flag removals between 2001 and 2005 (the earliest date we can identify a flag removal is 2002 due to data limitations).
- **Control Group:** Flag removals between 2006 and 2010.

Let i index individuals and t index years (from 2001 to 2005). Let α_i denote a set of individual fixed effects, and γ_t denote year dummies. Let $Y_{i,t}$ denote the outcome of interest (a self employment dummy, earnings, wages, etc.). Let $D_{x,i,t}$ be a dummy variable taking the value 1 when a member of the treatment group is x periods before (if x is negative) or after (if x is positive) flag removal. E.g. $D_{-2,i,t}$ is a dummy indicating if a treated individual is 2 periods before flag removal, likewise $D_{0,i,t}$ takes a value of 1 if the treated individual is in the year of flag removal, and $D_{1+,i,t}$ takes a value of 1 if the treated individual is 1 or more years past flag removal. The specifications we run are of the following form:

$$Y_{i,t} = \alpha_i + \gamma_t + \beta_{-2}D_{-2,i,t} + \beta_{-1}D_{-1,i,t} + \beta_0 D_{0,i,t} + \beta_{1+}D_{1+,i,t} + \Gamma X_{i,t} + \epsilon_{i,t} \qquad (2)$$

K.1 Alternate Empirical Design: Summary Stats

Table A14 describes the means and standard deviations of several key variables across the treatment ('Flag Drop') and control group ('No Flag Drop'), as of 2001.[30] As the table reveals, several of the mean values are significantly different across these two groups; however, what we show in the sections that follow, and what is essential for identification, is that the *trends* in these variables are parallel.[31] In the sections that follow, our analysis reveals parallel trends for the majority of outcome variables.

The variables in Table A14 are identical to those in Table 3, except the the alternate definitions of self employment and formal employment. Since our credit reports are measured in September of each year, we may mistakenly classify a removal as occurring in the present year when in fact it had occured between October-December of the prior year.[32] To address any concerns that there may be people who transition right away into self employment or formal employment following an October flag removal, we also use an alternate definition of self employment and formal employment (labeled in the tables as 'Self Employed, Alternate Def. (d)' and 'Formal-Employment, Alternate Def. (d)') which counts the individual as self employed if they earned at least $1k in Schedule C income last year and $1k Schedule C income this year. Likewise, we count a individual as formally employed under this alternate definition if they earned at least $1k in labor earnings last year and $1k labor earnings this year.

[30] Less than 5% of the panel enter at a later date, and in those situations we report the first observed value in the summary statistics.

[31] Due to the large size of the sample, even small differences in levels are statistically significant, even if they are economically insignificant.

[32] This is a problem, if for example, in September 2005 an individual has a bankruptcy flag on record and in September 2006 they do not; we would mark flag removal to occur in year 2006, however it may have been removed in October 2005, and they then immediately started a business.

Table A14: Alternate Empirical Design: Summary Statistics as of 2001, Treatment (Flag Drop) and Control (No Flag Drop) Groups

	(A) Employment Levels and Flows				
	Flag Drop		**No Flag Drop**		
	Mean	**SD**	**Mean**	**SD**	Diff. Means p<.05
Self-Employed, 1k (d)	8.1%	0.27	7.4%	0.26	*
Self-Employed, Alternate Def. (d)	5.4%	0.23	4.6%	0.21	*
Formal-Employed, 1k (d)	78.7%	0.41	78.8%	0.41	
Formal-Employed, Alternate Def. (d)	74.3%	0.44	74.2%	0.44	
Both SE and Formal-Employed (d)	5.7%	0.23	5.2%	0.22	*
Non-Employed, 1k (d)	18.9%	0.39	19.0%	0.39	
Only Self-employed, 1k (d)	2.4%	0.15	2.2%	0.15	*
Only Formal-Employed, 1k (d)	73.0%	0.44	73.6%	0.44	*
Transition into Self-Employed, 1k (d)	2.8%	0.16	2.8%	0.16	
Transition out of Self-Employed, 1k (d)	2.5%	0.16	2.6%	0.16	
Transition into Formal-Employed, 1k (d)	4.4%	0.21	4.6%	0.21	*
Transition out of Formal-Employed, 1k (d)	4.4%	0.21	4.7%	0.21	*
	(B) Earnings Characteristics				
	Flag Drop		**No Flag Drop**		
	Mean	**SD**	**Mean**	**SD**	Diff. Means p<.05
Formal Earnings Q4	$6,997.5	11209.3	$6,436.7	7719.7	*
Real Annual Labor Earnings (Adjusted for 0s: $41k)	$32,097.5	28704.7	$29,759.9	26482.2	*
Real Annual Self-Employed Net Income (Adjusted for 0s: $24k)	$2,009.2	9893.8	$1,631.8	8645.0	*
Real Total Annual Income (SE and Non-SE)	$34,106.7	29744.4	$31,391.8	27291.8	*
Self-Employed Income to Total Income	0.041	0.18	0.037	0.17	*
Arc Total Earnings Growth	-0.059	0.60	-0.056	0.64	
	(C) Credit Characteristics				
	Flag Drop		**No Flag Drop**		
	Mean	**SD**	**Mean**	**SD**	Diff. Means p<.05
Bankruptcy Score	262.7	181.8	153.9	104.1	*
Number of Accounts Opened	1.6	1.8	1.3	1.5	*
Real Bankcard Balance	$3,311.2	5681.6	$1,891.4	3820.0	*
Real Revolving Balance	$4,809.5	9022.4	$2,627.1	5988.2	*
Real Installment Balance	$17,513.5	26472.7	$13,843.3	22543.1	*
Real Mortgage Balance	$55,166.1	98186.3	$37,271.4	76750.1	*
Real HELOC Balance	$684.9	6813.7	$368.8	4786.9	*
	(D) Demographics and Employer Characteristics				
	Flag Drop		**No Flag Drop**		
	Mean	**SD**	**Mean**	**SD**	Diff. Means p<.05
Age	42.4	8.9	40.2	9.4	*
Imputed Years of Education	13.7	2.6	13.6	2.6	*
Tenure	2.4	2.3	2.3	2.3	*
Unemployment Rate	4.3	0.8	4.5	1.0	*
Employer Size ≥1000 (d)	0.243	0.429	0.244	0.43	
Employer Size ≥500 (d)	0.305	0.46	0.306	0.461	
Number of Observations	90000		140000		

Notes: Formal sector employment refers to those who earned at least $1k in a UI insured job covered by the LEHD. Self-Employment refers to those who earned at least $1k on their 1040 Schedule C. The Alternative Definition of Formal sector employment refers to those who earned at least $1k in a UI insured job covered by the LEHD for 2 consecutive years. The Alternative Definition of Self-Employment refers to those who earned at least $1k on their 1040 Schedule C for 2 consecutive years. Transitions defined as earnings more than $1k dollars in a sector in which you previously earned zero. Number of accounts opened refers to accounts opened in last 12 months.

K.2 Alternate Empirical Design: Stocks and Flows of Employment and Self-Employment

Table A15 illustrates the baseline 'stock' or levels of employment results using our alternate empirical design and using alternate definitions of formal and self employment. Table A15 generates very similar results to Table 4, and the alternate definitions of formal and self-employment results are similar to the baseline definitions. Following flag removal formal employment under the alternate definition increases by .655%, and self employment under the alternate definition remains flat. Table A16 and A17 illustrate the corresponding self-employment flows and formal employment flows for our alternate empirical design. Self-employment flows under the alternate definition increase by .2%. Flows out of self employment under the alternate definition increase, but the increase is insignificant. In both tables, however, the broad pattern is the same: flows into self and formal employment increase, and flows out of self employment increase (weakly). Generally, Table A16 and A17 support the results shown in Tables 5 and 12 shown in the main text.

Table A15: Alternate Empirical Design: Employment Levels and Bankruptcy Scores

	(1) Bankruptcy Score	**(2)** Bankruptcy Score	**(3)** Formal-Employed (d)	**(4)** Formal-Employed, Alternate Def. (d)	**(5)** Self-Employed (d)	**(6)** Self-Employed, Alternate Def. (d)
2 Years Before Removal (d)	77.04***	-13.18***	6.45e-05	0.000457	0.00175	0.000299
	(0.732)	(0.755)	(0.00150)	(0.00140)	(0.00117)	(0.000916)
1 Year Before Removal (d)	80.50***	-26.04***	0.00157	0.00116	0.000554	4.99e-05
	(0.655)	(0.887)	(0.00174)	(0.00166)	(0.00132)	(0.00109)
Year of Removal (d)	147.2***	29.45***	0.00397**	0.00353*	0.00170	-0.00107
	(0.798)	(1.047)	(0.00193)	(0.00185)	(0.00147)	(0.00122)
1+ Years After Removal (d)	110.1***	-34.51***	0.00623***	0.00655***	0.00320*	0.00126
	(0.684)	(1.162)	(0.00222)	(0.00213)	(0.00168)	(0.00140)
Fixed Effects (Individual and Year)	N	Y	Y	Y	Y	Y
Age and Tenure Controls	N	Y	Y	Y	Y	Y
R-Squared	0.120	0.122	0.113	0.221	0.002	0.003
Indiv.-Yr Obs	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000
Number of Indiv.	240,000	240,000	240,000	240,000	240,000	240,000

*Notes: SE in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Age and Tenure controls include quadratics in age and tenure. Fixed Effects include individual fixed effects and year dummies.*

Table A16: Alternate Empirical Design: Self-Employment Flows

	(1) Transition into Self-Employed (d)	**(2)** Transition out of Self-Employed (d)	**(3)** Transition into Self-Employed, Alternate Def (d)	**(4)** Transition out of Self-Employed, Alternate Def (d)
2 Years Before Removal (d)	0.00145	0.000755	0.000228	0.000301
	(0.000993)	(0.000929)	(0.000722)	(0.000667)
1 Year Before Removal (d)	0.000504	0.00196**	0.00107	0.000647
	(0.000969)	(0.000924)	(0.000745)	(0.000675)
Year of Removal (d)	0.00278***	0.00272***	-8.44e-05	0.000901
	(0.00104)	(0.000988)	(0.000775)	(0.000721)
1+ Years After Removal (d)	0.00194*	0.00271**	0.00205**	0.000660
	(0.00117)	(0.00111)	(0.000895)	(0.000809)
Fixed Effects (Individual and Year)	Y	Y	Y	Y
Age and Tenure Controls	Y	Y	Y	Y
R-Squared	0.000	0.000	0.001	0.000
Indiv.-Yr Obs	1,150,000	1,150,000	1,150,000	1,150,000
Number of Indiv.	240,000	240,000	240,000	240,000

*Notes: SE in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Age and Tenure controls include quadratics in age and tenure. Fixed Effects include individual fixed effects and year dummies. Transition into self employed if SE annual earnings greater than $1k this year, zero last year. Transition out of self employed if SE annual earnings greater than $1k last year, zero this year.*

Table A17: Alternate Empirical Design: Formal-Employment Flows

	(1) Transition into Formal-Employed (d)	**(2)** Transition out of Formal-Employed (d)	**(3)** Transition into Formal-Employed, Alternate Def. (d)	**(4)** Transition out of Formal-Employed, Alternate Def. (d)
2 Years Before Removal (d)	-0.000392	0.00110	0.00138	0.000427
	(0.00118)	(0.00126)	(0.00114)	(0.00116)
1 Year Before Removal (d)	0.000413	0.000474	0.000970	1.20e-05
	(0.00118)	(0.00124)	(0.00114)	(0.00116)
Year of Removal (d)	0.000437	0.000679	0.00258**	0.000395
	(0.00125)	(0.00131)	(0.00121)	(0.00122)
1+ Years After Removal (d)	-0.000325	0.00238	0.00263*	0.00162
	(0.00143)	(0.00149)	(0.00138)	(0.00139)
Fixed Effects (Individual and Year)	Y	Y	Y	Y
Age and Tenure Controls	Y	Y	Y	Y
R-Squared	0.025	0.032	0.002	0.037
Indiv.-Yr Obs	1,150,000	1,150,000	1,150,000	1,150,000
Number of Indiv.	240,000	240,000	240,000	240,000

*Notes: SE in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Age and Tenure controls include quadratics in age and tenure. Fixed Effects include individual fixed effects and year dummies. Transition into self employed if SE annual earnings greater than $1k this year, zero last year. Transition out of self employed if SE annual earnings greater than $1k last year, zero this year.*

L Verification of Results in Cross-Sectional Public Data: Survey of Consumer Finances 1998-2010

To compare our results to public data, we turn to the Survey of Consumer Finances (SCF) from 1998 to 2010. We consider households who have filed for bankruptcy in the last 19 years (to protect the identity of survey respondents, the year of bankruptcy filing is restricted to be 0-1, 2-3, 4-5, etc. and therefore so is the removal year). To keep the studies comparable, we limit ourselves to prime age (24-65) heads of household. Our main independent variable is years since flag removal which takes values from -9 to +9 (-9 is 9 years before flag removal).

L.1 SCF Summary Statistics

Table *A18* summarizes the sample of household heads used in the SCF analysis. Panel (A) describes the demographic characteristics of households. Approximately 27% have a college degree, the average age is 45, and the modal household head is white. Turning to Panel (B) which describes financial characteristics, on average, household heads with a prior bankruptcy record earn $65k per year (this is gross family income). Individuals have limited liquid asset positions but have relatively large (and skewed) illiquid asset positions. On average, households filed for bankruptcy 8 years ago, and roughly 48% of these households had credit denied when they applied. Bankcard limits total $8k and bankcard balances total $2k, despite the fact that many of these households have an active bankruptcy flag on their records. Panel (C) describes the employment and business ownership characteristics of households. Nearly 17% work for companies with less than 10 employees, and 12% own their own business.[33] Approximately 77% of the household heads are employed, and nearly 33% are working for employers with pensions or retirement plans.

L.2 SCF Results

Table A19 illustrates a distributed lag model around bankruptcy flag removal. Column (1) and (2) study employed households only. The general pattern in Columns (1) and (2) is

[33] Our Census Self-employment Records cover 1040 Schedule C income, and so for comparability, we exclude SCF households who own multiple businesses are unlikely to be using 1040 Schedule C returns to report business income.

Table A18: Summary Statistics, Prime-Age Heads of Household with Prior Bankruptcy in Last 20 years (Source: 1998-2010 SCF)

(A) Demographic Characteristics			
Variable	**Mean**	**p50**	**Std. Dev**
College Degree (d)	0.26	0	0.44
No College Degree (d)	0.24	0	0.43
12 or Less Years of Education (d)	0.50	1	0.50
Age	45.60	45	9.71
White (d)	0.72	1	0.45
Black (d)	0.17	0	0.37
Hispanic (d)	0.09	0	0.28

(B) Financial Characteristics			
Variable	**Mean**	**p50**	**Std. Dev**
Income	65628	40000	242598
Liquid Assets to Income	0.16	0.025	0.66
Illiquid Assets to Income	3.29	2.08	3.88
Years Since Filing	7.93	7	5.03
Denied Credit (d)	0.48	0	0.50
Bankcard Limits, Combined	8012	800	18916
Bankcard Balance, Combined	2099	0	5522

(C) Employment and Business Ownership			
Variable	**Mean**	**p50**	**Std. Dev**
Work for Company with Less Than 10 Employees (d)	0.17	0	0.38
Single Firm Owner (d)	0.12	0	0.33
Employed (d)	0.77	1	0.42
Job Pension (d)	0.33	0	0.47
Observations	1775		

that after flag removal, households are finding jobs at larger firms where they are more likely to have benefits such as a pension; however, point estimates and patterns are unstable in Column (1). Column (3) shows that self employment initially rises during bankruptcy and rises once again when the bankruptcy flag is removed. There are two competing forces at play: (i) the flag removal gives households access to more non-self-employment opportunities, and (ii) flag removal gives households access to more credit which may facilitate business formation and self employment. In terms of employment, Column (4) shows that employment rises following flag removal. For credit related outcomes, Column (5) shows that credit denials fall after flag removal, Column (5) shows that bankcard limits expand, and Column (6) shows that bankcard balances rise.

The small sample sizes limit the types of inference and experiments that can be conducted; moreover many of the point estimates and patterns appear unstable. While this analysis is merely describing correlations, we take the patterns to be consistent with the patterns observed in our LEHD/TransUnion dataset.

Table A19: Verification of Results in Cross-Sectional Public Data: Distributed lags around bankruptcy flag removal. Dependent variables are (1) Job Benefits (2) Size of Firm Employee Works for (3) Self-Employment (4) Employment (5) Non-Employment (6) Loan Denial, (7) Credit Limits, and (8) Credit Balances. (Source: 1998-2010 SCF)

	(1) Job Pension (d)	**(2)** Work for Company with Less Than 10 Employees (d)	**(3)** Single Firm Owner (d)	**(4)** Employed (d)	**(5)** Denied Credit (d)	**(6)** Bankcard Limits, Combined	**(7)** Bankcard Balance, Combined
7 Years Before Flag Removal	-0.025	0.046	0.042	0.020	0.039	661.0	-19.3
	(-0.49)	(1.40)	(1.62)	(0.57)	(0.90)	(0.77)	(-0.05)
5 Years Before Flag Removal	-0.012	0.053	0.054*	-0.016	-0.006	3,025.5***	620.0
	(-0.22)	(1.45)	(1.93)	(-0.41)	(-0.14)	(3.07)	(1.52)
3 Years Before Flag Removal	-0.039	0.044	0.033	0.023	-0.033	2,276.3**	735.7*
	(-0.73)	(1.32)	(1.22)	(0.64)	(-0.73)	(2.50)	(1.90)
1 Year Before Flag Removal	-0.085	0.100**	0.018	0.029	0.001	3,256.9***	573.7
	(-1.50)	(2.54)	(0.65)	(0.75)	(0.03)	(3.04)	(1.38)
1 Year After Flag Removal	0.045	0.092**	0.061**	0.063*	-0.073	5,809.6***	1,856.5***
	(0.82)	(2.51)	(2.10)	(1.71)	(-1.57)	(4.93)	(3.51)
3 Years After Flag Removal	0.097	0.067	0.066*	0.023	-0.089*	9,612.6***	2,748.7***
	(1.57)	(1.61)	(1.91)	(0.51)	(-1.65)	(4.80)	(3.92)
5 Years After Flag Removal	-0.034	0.050	0.011	-0.047	-0.123**	8,804.7***	1,535.7***
	(-0.47)	(1.19)	(0.32)	(-0.95)	(-2.25)	(3.88)	(2.68)
7 Years After Flag Removal	0.154*	0.001	0.024	-0.094	-0.143**	14,721.4***	3,131.1**
	(1.65)	(0.03)	(0.53)	(-1.50)	(-2.20)	(3.36)	(2.32)
9 Years After Flag Removal	-0.082	0.054	0.096*	0.075	-0.055	7,190.5***	2,081.9**
	(-0.93)	(0.96)	(1.77)	(1.29)	(-0.76)	(2.65)	(2.06)
Demographic Controls	Y	Y	Y	Y	Y	Y	Y
Year Dummies	Y	Y	Y	Y	Y	Y	Y
Wealth Controls	Y	Y	Y	Y	Y	Y	Y
Employed Households Only	Y	Y	N	N	N	N	N
Observations	1,167	1,167	1,775	1,775	1,775	1,775	1,775
R-squared	0.051	0.036	0.077	0.110	0.053	0.287	0.069

Notes: Robust t-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Demographic controls include a quadratic in age, race dummies, and education dummies. Wealth controls include liquid assets to income, illiquid assets to income, and income.