Article

Can Lowering Cost of Borrowing in Payday Loans Create a Win-Win Situation for the Borrowers and Lenders

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Abstract
Payday loans are worth exploring due to the intertwined effect of the traumatic financial burden caused by its high interest rate as well as the rigid demand for it from the credit-constrained population. While most previous literature focuses on the welfare impact of government intervention on payday loans, this paper explores the possibility of incentivizing payday lenders to cut interest rates without legislation. This paper analyzes the potential for a marginal reduction in interest to lower the default rate, hence creating a win-win situation for payday lenders and borrowers. Using the synthetic control method, this paper examines the impact of a slight decline in the maximum fee charged per $300 of payday loan on the composition of payday borrowers. The result suggests that a slight decline in the fee charged is likely to attract borrowers with higher income and lower default risk, which can benefit payday lenders and the borrowers simultaneously, creating a win-win situation.

Keywords: payday loan, synthetic control method

1. Introduction

Payday loans are defined as the small, high-interest rate loans that target low-credit borrowers (Melzer, 2011). The payday loan market has been rapidly expanding in recent years, in particular in the US. The number of payday shops increased from about 2000 in 1996 (Prager, 2009), to more than 23,000 in 2019, with around 2 million users in the US (Wang, 2023). As it affects more and more citizens, it attracts increasing attention from researchers and politicians.

The annualized interest rate for a payday loan is usually above several hundred percents, which is much higher than the interest rate from traditional sources of finance (Bhutta et al, 2012). This extraordinarily high interest rate naturally induces concerns about its impact on the welfare and financial health of borrowers (Bhutta, 2014). While some people believe this high interest rate is exploitive, defenders of payday loans usually judge the high interest rate as compensation for its high default risk.

Skiba and Tobacman explored the borrowing and default behavior of borrowers using a structural dynamic programming model. They found that most payday borrowers default on a payday loan within a year of their first loans. On average, those who default usually have already repaid five payday loans, covering 90% of the principal (Skiba and Tobacman, 2008). This suggests that the high default rate is not only a burden on the lenders, but also harms the borrowers who have partially repaid their debt but failed to repay in full. Thus, it is imperative to explore measures to reduce defaults.

Most of the previous literature focuses on the debate of the benefits and drawbacks of payday lending in terms of its welfare impact, with only a few analyses the impact of regulatory policies on the default rate. However, none of the existing literature explores the potential of creating a win-win situation by marginally cutting interest rates, while taking into account the impact of the potential change in the composition of borrowers.

This paper aims to explore this research gap. This is an important topic because if this is proved to be the case, the tension between payday borrowers and lenders may be alleviated, as they may both benefit from a slight decline in the payday interest rate, which may create a Pareto improvement in the payday market.

The rest of this paper takes the following structure. Section 2 reviews the previous literature on the impact of payday loans and relevant regulations. It also explains the inspiration for empirical analysis in this paper. Section 3 constructs the theoretical model and provides a theoretical background to justify the corresponding regression model. Section 4 describes the structure of the dataset constructed for the regression analysis. Section 5 presents the result from the regression which adopts the synthetic control method. Section 6 discusses the limitations of the empirical analysis and suggests topics of future research accordingly. Section 7 concludes the main contribution of this paper.

2. Review of Literature

2.1. Debate on the Welfare Impact of Payday Loans

There have long been disagreements about the net impact of payday loans on consumer welfare, and researchers have found mixed evidence.

Advocates typically argue that payday loans are beneficial in the sense that they offer those who cannot access traditional financial services a choice to borrow, hence improving their liquidity.

For instance, using a cognitive model, Lawrence and Elliehausen found that most payday borrowers are in the early stage of their life where they are credit-constrained due to relatively low income. Accessing payday loans benefits them by alleviating their credit constraint and enable them to better allocate their lifetime income. The authors also found that short-term use of payday loans for emergency purposes tends to improve the condition of the borrowers, although long-term use is likely to worsen their financial condition (Lawrence and Elliehausen, 2008).

Consistent with Lawrence and Elliehausen, Morse found that access to payday loans can benefit consumers when facing unexpected shocks. Using natural disasters as a source of exogeneity, Morse used a propensity score-matched triple-difference specification to examine the casual impact of access to payday loans on consumer welfare. He concluded that the availability

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of payday loans reduces the foreclosures caused by natural disasters, and it reduces larcenies. Therefore, the author concluded that payday loans can improve social welfare (Morse, 2011).

That being said, many researchers disagree that access to payday loans enhances consumer welfare. For example, Skiba and Tobacman found that the access of payday loans increases personal bankruptcy rate by a factor of two when using an administrative panel data set of loan records in a regression-discontinuity design. This suggests that payday loans are likely to worsen the cash flow position of the household (Skiba and Tobacman, 2019). This naturally leads to a query about whether policy interventions that aim to make the terms of payday loans more favorable to borrowers can enhance their welfare.

2.2. Exploring the Consequence of Regulations

While regulations that aim to create more favorable terms for payday borrowers may seem to be beneficent at first glance, research has shown that the actual impacts of these policies are usually more complex, and sometimes these policies may even backfire and worsen the welfare of consumers.

Skiba and Tobacman examined the profitability of the payday lenders using financial data from CRSP and SEC filings, and loan data from one payday loan lender. The authors found that, once the high default risk is considered, the return for a payday loan lender was almost the same as the typical returns from traditional financial institutions (Skiba and Tobacman, 2007). This suggests that the profit of payday lenders is likely to be just normal profit, which implies that policies that mandatorily make the payday loans terms more favorable to consumers may lead to bankruptcy of lenders. This may reduce the availability of payday loans, which can have unexpected negative impacts.

Consistent with the above prediction, Zinman found that when policy makers mandatorily make the terms of payday loans more favorable to borrowers, including restricting the maximum interest rate, the number of registered licensed payday loan outlet decreases significantly. This resulted in a fall in the borrowing, and former payday borrowers shifting partially into inferior alternative financial sources, including bank overdrafts and late bill payment. Many households found it harder to get short-term loans and their financial condition deteriorated. This provides evidence that restricting access to payday loans can negatively impact consumer welfare (Zinman, 2010).

Edmiston has found similar results. In his paper, Edmiston suggested that restrictions on payday loans could make some credit-constrained households lose access to credit, which could make it hard for them to manage their daily activities. Moreover, when experiencing a personal financial shock, a card-holding consumer may decide to make an over-the-limit credit card purchase if he cannot use payday loans. This can result in an excessive fee charged, which in many cases is significantly higher than the fee on an equivalent payday loan, making the borrower worse off (Edmiston, 2011).

Other researchers analyzing the effect of payday loan restrictions on consumer borrowing reached similar conclusions. Bhutta et al found that although these policies tend to reduce payday lending, consumers typically respond by shifting to alternative high-interest loans, such as pawnshop loans, instead of traditional sources of credit. (Bhutta et al, 2016). This suggests that simply restricting access to payday loans is unlikely to be effective to improve the financial health of the payday borrowers, as they stick with these high-interest sources of finance.

The main reason for some of the policies mentioned above to lead to negative consequences is that these policies result in a reduced supply of payday loans. However, other researchers have shown that government interventions, if implemented correctly, can be beneficial.

For instance, Carter analyzed the impact of allowing rollovers. She found that in states where rollovers are allowed, individuals with income less than $30,000 tend to use pawnshops together with payday loans. This may be because rolling over payday loans can incentivize these borrowers to take another payday loan rather than repaying the initial loan immediately, which eventually traps them in a debt cycle and forces them to use pawnshops to finance their debt. (Carter, 2015). This suggests that regulations on rollovers may be welfare enhancing, especially for low-income groups, without significant side effects.

Similarly, other researchers found that limiting repeat borrowing may be beneficial. Using an experiment with a large payday lender, they found that the majority of borrowers can reasonably correctly estimate the probability of future borrowing. The

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authors proved that banning payday loans negatively impacts welfare, but limiting repeat borrowing can possibly induce faster repayment hence improving welfare, as it is more consistent with the long-run preferences of borrowers. (Allcott et al, 2021).

While researchers disagree about whether regulations on payday loans are welfare-improving, most researchers agree that ceteris paribus (i.e. if the supply of payday loans is unaffected), lowering its interest rate is likely to alleviate the financial burden on borrowers.

2.3. Inspiration of Empirical Research

While borrowers have incentive to avoid default to secure future borrowing, research suggests that default may not affect the credit of the borrowers as much as people usually believe. For instance, Mann analyzed the impact of default on borrower. Using a difference-in-difference approach, Mann found that the change in credit score for borrowers who default on payday loans does not differ significantly from those who do not default. Also, borrowers who default on payday loans usually have experienced disproportionately large falls in their credit scores for at least two years prior to their default, so default is unlikely to increase their financial distress much (Mann, 2015). This suggests that borrowers may have an incentive to default when the repayment imposes too much financial burden on them.

While a large cut in interest may cause bankruptcy of payday lenders (Ramirez, 2020), reduction of interest rate within relatively small range is affordable for them, even without considering the potential gain from reduced default (Avery and Samolyk, 2011). This suggests that there is some potential room for this win-win situation (i.e. lower interest and lower default) to be explored. Therefore, this paper aims to explore the impact of a marginal change in the cost of payday borrowing.

Li, Mumford and Tobias were the first to directly explore the impact of changing interest rates on consumer borrowing and repayment behaviour. In their paper, the authors assumed borrowers to make decisions in three stages: they first decide the amount to borrow, then they decide the number of times to renew the loan, and finally they decide whether to default. The authors modelled the distribution of the consumer decision with a finite Gaussian mixture model and included interest rate as one of the explanatory variables for borrower's decision. With data from a payday lender, the author performed empirical analysis and concluded that the lower interest rate can reduce default as well as encourage borrowers to hold the loan for a longer period. (Li et al, 2012).

However, their model did not capture the impact of the behaviour of borrowers to switch between alternative sources of finance when the payday interest changes, which can affect the composition of payday borrowers in terms of proportion of low-default-risk borrowers in the pool.

Previous research suggests that payday borrowers usually have the opportunity to choose between payday loans and pawnshops (Bhutta et al, 2016), and some even have access to traditional credit cards.

For instance, using a dataset matched at the individual level, some authors explored household choices between payday loans and credit cards. Many payday borrowers have substantial unused liquidity on their credit cards when they borrow on payday loans. (Agarwal et al, 2009).

Consistent with Agarwal et al, Melzer and Morgan studied the competition in the market for small, short-term consumer loans. They found that payday loan bans affect overdraft credit terms in mainstream financial intermediaries, which provides evidence that there is competition between payday lenders and traditional depositories. (Melzer and Morgan, 2015).

Since people who can access to credit cards are usually the ones with relatively low default risk, payday lenders may benefit from a lower overall default risk if a slight reduction in payday interest can induce the consumers who initially marginally preferred credit cards to payday loans to switch to payday loans.

Meanwhile, some researchers found evidence of adverse selection when loan size varies. Dobbie and Skiba explored the relationship between payday loan size and default using sharp discontinuities in loan eligibility rules. They found that there is economically and statistically significant evidence of adverse selection into larger loans, but for a given borrower, an increase in loan size reduces his default probability. However, this positive within-borrower impact of larger loan size tends to be outweighed by negative impact from adverse selection (Dobbie and Skiba, 2013).

That being said, the choice of loan size mainly affects the decision of those who have already decided to take payday loans from a particular lender. Therefore, despite its impact on default risk, it is unlikely to directly attract new borrowers with lower default risk, hence unlikely to influence the composition of borrowers faced by each lender. Therefore, the impact of loan size will not be addressed in this paper.

Overall, this paper assumes that the impact of change in payday interest (or other measures of the cost of payday loan) on the profit of payday lenders is akin to the impact of tax rate on government revenue, as suggested by the Laffer curve. The fundamental assumption behind the logic of the argument in this paper is that the current fee of payday borrowing may be higher than the optimal fee which will maximize profit for the payday lenders. However, this paper cannot examine this assumption, as the profit of payday lenders can be affected by many factors, including changes in the macroeconomic environment, making it infeasible to isolate the impact of change in fees on the profitability of payday lenders.

If the assumption above holds, a marginal decline in payday fees may attract borrowers with better creditability, which will reduce the overall default rate faced by the lenders. For small reduction in fees, the gain from the lower default risk may outweigh the loss from lower fees, allowing a rise in profit for payday lenders. However, this may only apply for small fall in fees, as eventually the loss from lower fees will dominate, driving payday lenders out of market, as suggested by Ramirez (Ramirez, 2020).

The next section constructs the model for empirical analysis of the impact of a small change in the fee of payday loan on the proportion of high-income borrowers in the pool faced by payday lenders. For the reasons stated above, it only focuses on small changes in fees.

3. Empirical Strategy

To explore the possibility of a win-win opportunity following a slight reduction in the payday interest, the synthetic control method is used in this paper to identify the causal impact of a minor change in the cost of payday borrowing on the composition of payday users.

The following subsections illustrate the theoretical background of the model, the mathematical formulation, and the expected result.

3.1. Theoretical Background

The dependent variable in this study is a measure of the default risk of payday users. Ideally, the 'Vantage score' should be used, which provides a measure of the creditability of subprime borrowers. As suggested by Correia, Han, and Wang, 'Vantage score' is a powerful predictor of the default probability of payday users (Correia, Han, and Wang, 2022).

However, due to legislations on the protection of private information, individual-level data of 'Vantage score' is unobtainable. An alternative measure of default risk is the self-reported income, as suggested by Correia, Han, and Wang. The authors indicated that self-reported monthly income can be a good predictor of the default risk of payday borrowers. Those with higher self-reported income tend to have lower default risk (Correia, Han, and Wang, 2022). Therefore, this paper uses a measure of self-reported income of payday users to proxy their default risk. More specifically, this paper uses the proportion instead of the number of payday borrowers that have relatively high income in each state to measure the overall quality of payday borrowers in each state. This controls for the impact of potential changes in the total number of payday users overtime.

The key independent variable is the cost faced by payday borrowers. Correia, Han, and Wang pointed out that the cost per $100 is uncorrelated with borrower income. This implies that while the payday lenders adjust fees based on the overall default rate, they do not personalise the fees for each individual borrower (Correia, Han, and Wang, 2022). This suggested that fee for a certain size of payday loan is a desirable independent variable as it prohibits the potential reverse causality of income on the cost of payday borrowing, making the model more likely to identify whether decline in the cost of payday borrowing can attract those with higher income and lower default risk.

Another candidate measure of the cost of payday borrowing is the interest, measured by the annual percentage rate (APR) of payday loans. However, the authors showed that the APR is positively correlated income for storefront payday loans, due to

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a negative correlation between income and loan duration (Correia, Han, and Wang, 2022). This reverse causality of income on APR makes it unsuitable for identifying the causal impact of APR on the composition of borrowers. Therefore, this paper will use the fee for a given size of payday loan as the independent variable.

However, similar to the case of 'Vantage score', data on the fee faced by each individual payday borrower is unavailable due to privacy protection. As an alternative, this paper uses the restriction on the maximum fee that the payday lenders are allowed to charge in several states in the US to proxy the cost faced by payday borrowers. This is inspired by Li, Mumford and Tobias, as they used the state-level variation in the maximum interest rate to proxy the interest rate faced by individual borrowers, which satisfies the exclusion restriction (Li, Mumford and Tobias, 2012).

Apart from the cost of borrowing, previous literature illustrates that the change in the maximum loan size may affect the default risk (Dobbie and Skiba, 2013). However, this paper does not include the restriction on maximum loan size as a control variable. Because this paper attempts to explore the possibility of lower cost of borrowing to attract borrowers with lower default risk, which is proxied by their income. It does not attempt to analyse the impact of varying loan size on the behaviour of borrowers who have already decided to take a payday loan. Since the loan size is unlikely to affect the decision of whether to take a loan from a particular payday borrower, it is not controlled in this paper.

Previous literature also points out that the number of rollovers affects default risk of those who have taken payday loans (Carter, 2015). However, for similar reasons as the case of loan size, the impact of the number of rollovers is not analysed in this paper.

3.2. Model

Mathematically, the overall default risk of payday borrowers in each state i in a given year t can be expressed as:

$$income_{i,t} = \alpha_i + \beta_i \cdot fee_{i,t} + \varepsilon_{i,t}$$

Where $income_{i,t}$ is the proportion of payday borrowers who have relatively high income in state i. $fee_{i,t}$ is the maximum fee allowed for a given size of loan in state i, according to the state regulation.

α_i is the intercept in the regression for state i. β_i measures the impact of change in the maximum fee allowed on the proportion of borrowers in state i with relatively high income. $\varepsilon_{i,t}$ is the error term, which constitutes all the other unobserved factors that may affect the proportion of payday users that have relatively high income.

Since many macroeconomic variables, such as the overall unemployment rate in each state, cannot be controlled in this paper due to the limit of data, they are included in the error term. This may cause the error term to correlate with the dependent variable $income_{i,t}$ and undermine the exogeneity assumption, which is required for the identification of a causal inference.

Also, the proportion of payday users with high income in each state may increase overtime due to economic growth, so $income_{i,t}$ may naturally increase overtime even without any change in $fee_{i,t}$. This undermines the effectiveness of an ordinary least square (OLS) regression in identifying the causal impact.

To avoid the potential confounding problems and the impact of the passage of time, this paper adopts the synthetic control method. It uses South Carolina (SC), which increased its limit on the maximum fee allowed between 2009 and 2011 as the treatment group and uses 12 other states to replicate the counterfactual situation in SC had SC not changed its regulation.

South Carolina is chosen because within this period, the maximum fee only increased moderately, from \$45 per \$300 to \$45.4 per \$300, which is ideal for analyzing the impact of a marginal change in the cost of payday loans. Although this paper attempts to explore the impact of a small decline in the fee rather than an increase, it is likely that the impact of these two will be symmetric. However, this assumption cannot be tested in this paper due to limit of data.

The dataset contains one state which lowers the maximum fee allowed, which is Rhode Island (RI). However, the change in that state was large, as the cap decreased from \$45 per \$300 to \$30 per \$300. This dramatic change in regulation may drive some payday lenders out of the market and force some borrowers to switch to alternative sources of finance, which makes it

unreliable for the causal analysis of change in fees on the composition of borrowers. This paper attempts to examine the impact of a marginal decline in fall in fee to avoid this potential confounding impact, so the treatment group chosen is SC instead of RI.

The model used in the synthetic control method can be expressed as follows:

$$income_{SC,t} = income^{N}_{SC,t} + D_{SC,t}$$

$income^{N}_{i,t}$ is the counterfactual of $income_{i,t}$ generated using the synthetic control method. $D_{i,t}$ measures the treatment effect, which is the difference between the realized proportion of payday borrowers with high income and the counterfactual in the treatment group (SC) after the year of treatment (2011), as SC changed its regulation on the maximum fee after 2010.
The synthetic control method will use a weighted average of $income_{i,t}$ in other state to construct a counterfactual value for state SC had it not changed its regulation in 2011. It will identify a vector of optimal weight of $income_{i,t}$ in each state, which minimizes the difference between the counterfactual and the actual proportion of payday users with high income in state SC in 2009, the year before the change in regulation. This weight is then used to construct the counterfactual of $income_{SC,2011}$.

Section 4 explains the structure of the data used for this regression analysis in more detail.

3.3. Hypothesis

As illustrated in previous sections, a slight decline in the fee charged for a given size of payday loan is expected to attract borrowers with lower default risk, which is measured by $income_{i,t}$ in this paper. This means that $income_{i,t}$ is expected to increase when the maximum fee allowed decreases, vice versa. This hypothesis is checked with the result from regression in Section 5.

4. Data

The analysis in this paper is based on data from Alex Kaufman (2013), who summarized changes in payday loan regulation in several states, and Federal Deposit Insurance Corporation (FDIC), which records the income of payday borrowers.

The data of the independent variable '$fee_{i,t}$' are obtained from Table 2 in the paper of Alex Kaufman (2013). $fee_{i,t}$ in this paper is the maximum fee per $300 in each state. The author summarized the data between the year 2007 and 2012. However, the data of income from FDIC only includes the years 2009 and 2011, and years after 2012. Therefore, this paper restricts focus to years when data are available in both sources, namely the years 2009 and 2011. 2009 is the year before the treatment (i.e. the change in maximum fee in SC). 2011 is the year after the treatment.

Apart from that, since the synthetic control method can only be applied for numeric data, this paper excludes the states that have no limit on fees.

The dependent variable $income_{i,t}$ is computed based on data from FDIC. This paper used the dataset of National Survey of Unbanked and Underbanked Households in year 2009 and 2011 (FDIC, 2023). The FDIC dataset constitutes data of family income of more than 70,000 households and the number of people living in a household. This paper restricts the data to the people who are the only members living in the household. This is because the empirical evidence from Correia, Han, and Wang can only prove that the income of the payday borrower himself (or herself) is a valid predictor of default risk, while the impact of family income and household size is unclear. Therefore, this paper uses data of people with household size of 1 to identify the income of themselves, as in this case their family income and the income of themselves coincide.

The dataset from FDIC labelled the annual family income as 'hefaminc', but in the document of variable description provided by FDIC, family income is labelled as 'hufaminc'. This paper assumes that these two refer to the same data, because this is the only variable related to family income. Also, the variables in the dataset and the descriptive document are listed in the same order, and 'hefaminc' and 'hufaminc' appear in the same order in the corresponding lists.

Moreover, only part of the people in the dataset used payday loans, which is indicated by the variable 'hes26' in the dataset in 2011. The regression analysis of paper only uses observations whose value of 'hes26' equal to 1, which indicates that

person used payday loan in the past 12 months. The dataset of 2009 does not explicitly include a variable to indicate whether a person used payday loan in the last 12 months. However, it includes a variable 'hts21', which indicates the number of payday loans that borrowers used in the past year. Therefore, only observations with 'hts21' greater than 0 are included in the analysis of this paper, as these are the only people who used payday loans in the pre-treatment period.

After restricting the range of data to people living alone and used payday loans in the past year, the dependent variable '$income_{i,t}$' is computed based on the value of 'hefaminc'. 'hefaminc' measures the family income by assigning it into different brackets, e.g. less than \$5,000, \$5,000 to \$7,499, and so on. The first bracket is assigned with a value 1, the second bracket is assigned with a value 2, and so on. This paper defines $income_{i,t}$ as the proportion of payday users whose 'hefaminc' is greater than 5, which means an annual family income above \$14,999. This threshold is chosen because this is the income bracket with relatively large variation across different states. Too few payday borrowers have income in higher brackets, and majority of payday users had income above the upper bound of lower brackets, resulting in insufficient variation in lower brackets.

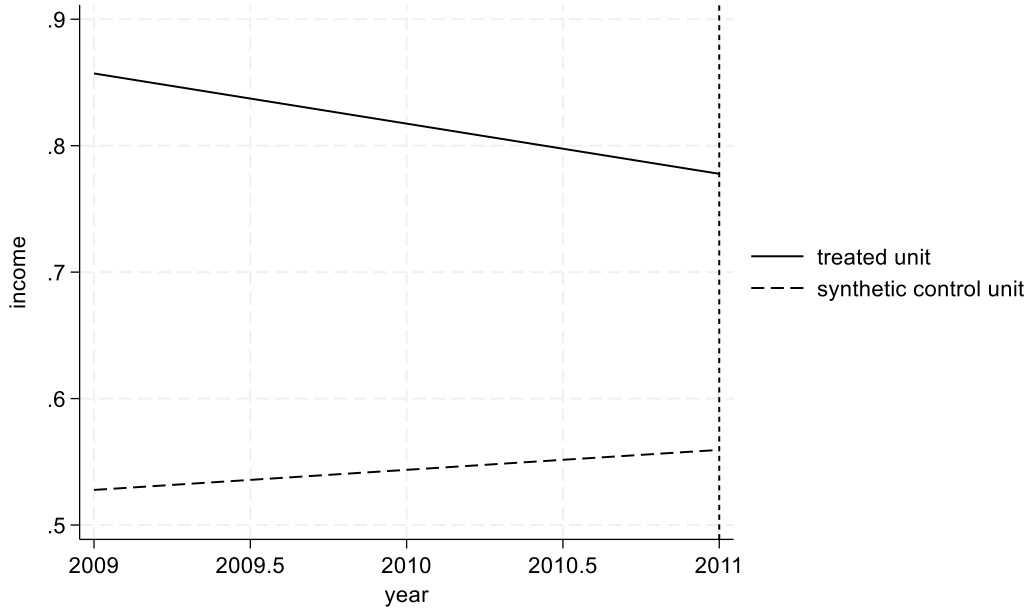
The final dataset constructed for the synthetic control method in this paper is provided in the appendix at the end of this paper.

5. Results

This paper uses the synthetic control method to explore the impact of a slight decline in the fee charged on payday borrowers on the composition of payday borrowers, i.e. the proportion of payday borrowers who have relatively high income. The criteria for 'relatively high income' is defined in section 4. The regression is conducted using Stata. The Stata codes used are provided in the appendix.

The analysis focuses on the state South Carolina (SC), which slightly increased its limit on the maximum fee between 2009 and 2011. In 2009, the limit on the maximum fee per \$300 in SC was \$45. However, in 2011, it increased to \$45.4.

The graph below (Graph 1) plots the proportion of payday borrowers with annual income above \$14,999 (which is labelled as 'income', as shown on the vertical axis) in South Carolina between 2009 and 2011. The solid line is the actual change in the proportion of payday borrowers with annual income above \$14,999, and the dotted line is the counterfactual change simulated using the synthetic control method.



***Graph 1**:* Change in the proportion of payday borrowers with high income in SC

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It can be seen from the graph that the actual proportion of high-income payday users in SC declined between 2009 and 2011 as the maximum fee increased slightly. However, the counterfactual suggests that the proportion of high-income payday users is expected to increase had the maximum fee remain unchanged. This suggests that a slight increase in the cost of borrowing is likely to discourage borrowers with relatively high income and relatively low default risk from taking payday loans, leaving the payday lenders with a worse pool of borrowers. This is consistent with the hypothesis in section 3.3.

This result suggests that it may be profitable for payday lenders to slightly reduce the fees charged to attract borrowers with higher income and lower default risk. This may reduce the overall default rate of the pool of borrowers faced by each payday lender and may increase the profit of payday lenders if the positive impact of lower default rate on profit outweighs the negative impact of lower fees per loan. Lowering fees on payday loans can also reduce the financial burden of payday users, which can be welfare-improving. This can be a potential win-win opportunity for the payday lenders and payday borrowers.

However, the p-value for the counterfactual generated by the synthetic control method is 0.4166667, indicating that the treatment effect of a slight change in fee is not statistically significant. This high p-value may be due to the small sample size used in this analysis. There are only 26 observations after aggregating data into state level, which may lead to a large standard error when constructing the counterfactual, undermining the statistical significance of the treatment effect.

6. Limitations and Scope for Future Research

While the result supports the idea that a slight decline in the fee of payday loan may create a win-win situation for the lenders and the borrowers, it is statistically insignificant due to the small sample size. Therefore, this result needs to be tested with a larger dataset to examine its validity, which can be a topic for future research.

This is especially true as the synthetic control method is ideal for large dataset with several periods before the treatment and several periods after the treatment. However, the dataset used in this paper only contains one year before the treatment and one year after, which can cause the counterfactual created by the synthetic control method to be imprecise. This is reflected by Graph 1, as the counterfactual is not close to the actual outcome even before the treatment (i.e. in 2009). This suggests that the counterfactual outcome in 2011 may not be close to the true potential outcome had the maximum fee remain unchanged.

To solve this problem, future research may use datasets with more years of observations before the change in maximum fees to establish a better replication of the trend in the treatment state (SC). A placebo test should also be taken to examine the quality of the counterfactual generated by the synthetic control method if the size of dataset permits.

At the same time, the change in the maximum fee serves as a dummy variable in the analysis in this paper. The result obtained in this paper only suggests that a decline in fee charged may have a positive impact on the overall creditability of payday borrowers, but the size of impact per unit change in the maximum fee cannot be obtained with this setting. Future research may explore the per unit effect.

Apart from that, while income is a good predictor of the default risk of payday borrowers, a more direct measure of the default risk, such as 'Vantage score', may provide a more precise prediction of default risk. Also, this paper used data aggregated to state level, while individual-level data of the payday loan choice of each borrower and the fee they each face may provide more insights. Therefore, future research may attempt to test the result of this paper by replacing income using 'Vantage score' and use individual-level data of payday borrowers, if the relevant data are obtainable.

In addition, the idea that a lower overall default rate induced by lower fees can improve the profitability of payday lenders needs to be examined with empirical data. Although the analysis in this paper shows some signs that a marginal decline in the fee charged by the payday lenders may benefit them by attracting better borrowers, the overall impact on profit may still be negative if the reduction in default rate is not sufficient to compensate for the lower revenue caused by lower fees. Future research may examine this.

Also, this paper infers that a marginal fall in fees charged can attract better borrowers by assuming the impact of a reduction in fee will be symmetric to the impact of a rise in fee of comparable size. However, while this assumption seems to be intuitively true, it needs to be tested empirically to prove its validity. This can also be a topic for future research.

Moreover, the authors Correia, Han, and Wang (2022) only showed that monthly income is a good predictor of the default risk of payday borrowers, while the analysis in this paper used annual income. However, this is unlikely to be a problem as people with higher monthly income are likely to also have higher annual income, unless their income is very unevenly distributed throughout the year, due to, for instance, unemployment.

7. Conclusion

Using the synthetic control method, this paper examines the impact of a slight decline in the maximum fee charged per $300 payday loan in South Carolina on the proportion of payday borrowers that have relatively high income. The result suggests that a slight decline in the fee charged is likely to attract borrowers with higher income (i.e. lower default risk). Thus, a marginal decrease in fees may benefit both payday lenders and borrowers, creating a win-win situation.

This paper addresses the research gap of the impact of a minor change in the cost of payday borrowing on the composition of payday borrowers. It shows the possibility of mitigating the conflict of interest between the payday lenders and borrowers. This may enable meaningful welfare improvement if, for instance, government can persuade payday lenders to marginally reduce the fee they charge, instead driving lenders out of market by capping the fee to be unprofitably low via legislation.

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Appendix

The dataset used for the regression analysis:
https://drive.google.com/file/d/1IfRr2R6sYQcgji3iYJ7gNnv7x-jZRNlD/view?usp=sharing

The Stata code used for the regression analysis:
tsset statecode year

synth income fee, trunit(45) trperiod(2011) [resultperiod(2011) figure]

synth_runner income fee, trunit(45) trperiod(2011)

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