

**EVALUATION OF CANADIAN PAYDAY LENDING REGULATIONS USING
PROPENSITY SCORE MATCHING TECHNIQUES**

by

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Abstract

The dramatically high interest rates charged on payday loans and the otherwise surprising demand for such short-term credit options earned policy interest in recent years. Due to the divisiveness of existing empirical and theoretical work – one side claiming the loans ensnare users to a dangerous cycle of debt and another side claiming the practice enables users to absorb unanticipated, one-off cash expenses – Canadian provincial governments have enacted different legislations to regulate the payday lending industry – some more stringently than others. This research takes advantage of these differences to evaluate financial outcomes of payday borrowers who are subject to various legislations. Using a sample dataset of 8,000 bankruptcy and Division II e-files from 2005 to 2014 and employing propensity score matching techniques, this research finds that the slide to financial ruin is faster for payday borrowers in provinces that legalize payday lending and free the annual percentage rate applied on these loans from the 60% federal rate cap. Moreover, it seems such effect is exacerbated when rollover is allowed though this result is not strongly statistically supported in the given dataset.

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1. Introduction

A new wave of regulations governing banks and other financial institutions surged following the recent financial crisis. Such regulations required banks to keep more capital and employ more prudent risk-taking activities in order to avoid the mistakes that led to the events in fall 2008. This eventually led to the rise in demand for alternative financial service providers (AFSPs¹) by the sector under-served by mainstream banks. Payday lenders, pawnshop brokers, check-cashing, rent-to-own stores, and credit repair companies are just some of the types of AFSPs that rose in order to fill the demand for short-term, high-cost credit.

Payday lending is deemed to be the fastest growing segment of the micro-credit industry. However, a study by Ramsay (2000) demonstrates that annual percentage rate (APR) of a 14-day loan in the Greater Toronto Area ranges from at least 335% to as high as 650%. Despite being an expensive short-term loan, the Canadian Payday Loan Association (CPLA) estimates that approximately two million Canadians demand payday loans every year.² This suggests that a good fraction of the population is willing to pay extremely high fees in exchange for a quick cash loan. Goldin and Hoffman (2013) interpret this as a “general desire for short-term credit,” whether it is high interest does not really matter. This is why the industry earned the interest of many policymakers and other analysts.

In 2007, the federal government enacted Bill C-26 which amended section 347 of the Criminal Code of Canada which deems charging usurious rates illegal. The 2007 amendments exempted payday loans from the 60% annual interest rate cap. This is due to payday loans being

¹ For definition, see Smith, Smith and Wackes (2008).

² In the US, Skiba and Tobacman (2009) reports that approximately ten million Americans are estimated to borrow payday loans each year. Moreover, the authors report that as of 2010, there are more payday lenders in the US compared to the number of Starbucks and McDonald’s combined.

small-sum and short-term type of loans – where the principal amount does not exceed \$1,500 and with maturity of usually 62 days or less. However, this exemption is conditional on having provincial legislations in place to regulate payday lending. Provinces quickly reacted and placed their respective rules and regulations. The goal is not to drive the industry out of business. It is to achieve a dual aim, to ensure a competitive and sustainable payday lending environment without charging dramatically high interest rates that may lead borrowers to the path of insolvency instead of providing a purposeful form of credit.

In spite of the payday lending regulations currently in place, there still exist two contrasting views about the industry. Industry supporters claim that payday loans are beneficial because they allow credit-constrained consumers in meeting their short-term, abrupt financial needs. With the right regulations in place, the industry will continue to provide such benefit to those who need it. This view is supported by the CPLA which represents 19 payday lending companies. Initially formed in 2005, the association is now comprised of 816 outlets out of 1,537 payday retail stores and licensed internet lenders in the country. Its members self-regulate themselves by implementing the Code of Best Business Practices. The CPLA also works with provincial legislators to ensure regulations will achieve the dual aim of keeping the industry competitive and providing accessible small-sum loans to credit-constrained individuals.

On the other hand, critics are quick to dismiss the industry altogether and call for an outright ban of the practice. They claim that consumers are already financially distressed before they even find themselves in front of a payday lender. Increasing access of such consumers to high-cost, short-term credit like payday loans will only trap them into a cycle of debt, and eventually lead to insolvency. The mayor and city councilors of Maple Ridge, BC, for example, showed their strong views against payday loans as they passed a bylaw last April 2015 to ban any

more payday loans from opening shops in the city. Councilor Tyler Shymkiw advocates against the development of payday loan or check-cashing businesses as he believes the industry targets low-income households who struggle to make ends meet from paycheck to paycheck. He initiated the motion to ban any more payday loan outlets in a council meeting on January 13, 2015. The councilor also cited that payday loans “are significant contributors to the cycle of poverty” and that they have “devastating effects to the working poor.”

These contrasting views of payday loans may have influenced the stringency of provincial payday lending regulations. Some legislations are more accommodating to the industry whereas applying the 60% federal rate cap is deemed unprofitable for payday lenders. These differences motivate the current study. This research seeks to advance the payday lending literature in two significant ways. Mainly, this is the first Canadian empirical work to estimate the effects of the provincial payday lending legislations that were implemented following the 2007 amendments to section 347 of the Criminal Code. Secondly, this work applies propensity score matching techniques to carry out the evaluation of payday lending regulations, whereas much of the recent work employs difference-in-difference, fixed effects and regression discontinuity design methodologies.

This study extends the findings of Mayer (2004) and Berry and Duncan (2007) who found that insolvent payday loan users (“PDL users”) have lower debt-to-income ratios than insolvent non-payday loan users (“non-PDL users”), suggesting that PDL users go insolvent faster than non-PDL users. Using a random sample of consumer bankruptcy and Division II e-files from 2005 to 2014, requested from and provided by the Office of the Superintendent of Bankruptcy (OSB), I carry out propensity score matching estimation – a method that is very common in program evaluation that estimates causal effects of a policy or intervention on outcomes. Results show

support for the harmful view of payday lending. That is, the slide to insolvency is faster for payday borrowers in provinces where payday lenders are licensed and are legally allowed to charge dramatically higher interest rates than the 60% federal annual interest rate cap. Specifically, payday lending regulations enacted in Alberta, British Columbia, Manitoba, Nova Scotia, Ontario and Saskatchewan cause short-term debt-to-income ratios of insolvent borrowers to fall by a range from -1.173 to as huge as -3.245. This effect was found robust to alternative definitions of debt-to-income ratio and of the control units. Supplementing this finding is the result from the second test where it was found that insolvent payday borrowers in provinces where rollovers are allowed (British Columbia, Manitoba, and Nova Scotia) go insolvent somewhat faster than corresponding borrowers in provinces where rollovers are prohibited (Alberta, Ontario, and Saskatchewan). The fall in the debt-to-income ratio ranges from -0.098 to -0.392. Though this effect is not found to be statistically significant, it is recommended for improvement with more sample points to draw propensity score matches from.

This paper proceeds as follows: Section 2 provides a brief background of the payday lending industry in Canada including its history and growth, the business model, and the current provincial regulations. Section 3 surveys existing literature by citing the studies that prove the beneficial and harmful views regarding payday loans and the works that look into the effects of payday lending regulations. Section 4 describes the bankruptcy data obtained from the OSB and briefly discusses propensity score matching method. Section 5 talks about the results. Section 6 concludes and gives recommendations.

2. Payday Lending in Canada

2.1 Brief History and Growth

The history of payday lending goes back to the twentieth century where the activity was known as “salary-buying.” Salary buyers would offer to purchase an individual’s paycheck at a discount. Such service was especially important to immigrants coming from rural areas because they are faced with the challenge of meeting day-to-day cash expenses. The industry evolved significantly throughout the years and started to expand largely during the 1990s. W. Allan Jones, who opened Check-Into-Cash in 1993 in Cleveland Tennessee, is considered the “father of modern payday lending.” The expansion of the industry is partly due to the rise in demand for alternative finance from consumers who are deemed to be “too risky” by mainstream financial institutions. After the recent financial crisis, financial institutions employed stricter regulations and slowly eliminated their short-term loan services. These factors contributed to the growth of payday lending.

The industry emerged in Canada in the mid-1990s. According to a research by Kitching & Starky (2006), by 2004 there were approximately 1,200 payday loan stores in Canada. To date, Money Mart – the dominant payday lender in Canada – alone has over 500 retail outlets across Canada. Every year, approximately two million Canadians use this form of small-sum, short-term credit, according to the Canadian Payday Loan Association (CPLA).

Nowadays, some payday loan companies are being publicly traded in Canadian stock market. The US-based Dollar Financial Group Inc., which is Money Mart’s parent company, is publicly traded in the NASDAQ stock market. The Cash Store Financial Services Inc., previously known as Rentcash Inc., was publicly traded in the Toronto Stock Exchange and New York Stock Exchange. In 2013, it reported having 510 branches all over Canada and 27 in the United Kingdom.

However, in February 2015, the Cash Store Financial Services Inc. has been completely acquired by Money Mart following its CCAA filing in April 2014. Some analysts claim that Cash Store's business operations failed largely because of the substantial regulations in payday lending.

2.2 Business Model

The business model of this rapidly growing microcredit market is quite simple. A payday borrower can obtain cash immediately in exchange for a post-dated check or a pre-authorized direct withdrawal from the borrower's checking account – both payable on the borrower's next payday. Such check or pre-authorized withdrawal is usually for the principal amount of the loan plus interest rate and other charges. Typically, a payday borrower is simply required to provide a proof of age, address, employment and a valid bank account. Some lenders conduct credit check but most of them do not since the industry caters to credit-constrained individuals. The simplicity of the process, along with the convenient store hours and locations, allows a borrower to obtain a loan within minutes of stepping into a payday lender retail store.³

An important element in this model is that the borrower must ensure enough cash is available at payday in order to avoid NSF charges and other fees that the lender may charge should the check bounce. Traditionally and still rarely nowadays, borrowers have the option to renew or “rollover” the principal loan. Rollover is a practice where the payday lender extends the maturity date of the loan in exchange for additional fees charged to the borrower.

Some analysts claim that rolling over loans is an unfair practice since the lender (borrower) earns additional profits (costs) without providing (receiving) any service or product. In relation to this, another issue pointed out is the extremely high annual percentage rates that the loans tend to

³ Some payday lenders also operate online. This provides easier access to credit and more convenience for payday borrowers. Distinguishing between online lenders and retail outlet lenders is beyond the scope of this study.

reach if they are rolled over. On the other hand, the industry defends rollover as an optimal option since a borrower who does not have sufficient funds at maturity will try to get loan elsewhere anyway. By doing so, the borrower would end up incurring higher fees than he would if the initial loan was simply rolled over. The industry also argues that by extending loan maturity, the lender assumes higher risk of default so charging fees in exchange for such option is quite justifiable.

2.3 Provincial Legislations

Because of these controversies surrounding payday lending, regulators in Canada have already stepped in. To ensure consumer protection, section 347 of the Criminal Code of Canada was amended through Bill C-26. The amendments received Royal Assent in May 2007. Bill C-26 exempted payday loans from the anti-usury law because they are short-term with maturity of 62 days or less and they are small-sum with face value of at most \$1,500. This exemption is conditional on provincial governments placing their own regulations concerning payday lending in their respective jurisdictions. Consequently, Alberta, British Columbia, Manitoba, Nova Scotia, Ontario and Saskatchewan all enacted their own provincial legislations. It can be noted that the stringency of the regulations vary by province. This is most likely due to the contrasting and inconclusive evidence from empirical work that studies the effects of payday lending.

Licensing was at the forefront of each provincial regulation. In Manitoba, license fees go to the Manitoba Payday Borrower's Financial Literacy Fund which is used to fund projects and initiatives aimed at increasing financial literacy and financial risk awareness of Manitoba residents.

Provinces also placed what they deem to be reasonable payday lending rate caps. For example, in Ontario the rate is 21% as determined and suggested by the Maximum Total Cost of Borrowing Advisory Board to the Ontario government. The Board, after an extensive study of the industry, determined that 21% is the optimal payday loan rate that is both fair to borrowers and

maintains a competitive payday lending industry. The rate is justified by the higher operating costs and bad debt costs incurred by payday lenders in providing fast and efficient service as well as convenient store hours and locations. Among the six provinces with regulations, Manitoba has the most extreme interest cap of 17%. Nova Scotia has changed its interest cap three times since 2009. It had initially set it at 31%. This was reduced to 25% as of 2011, and recently reduced it again to 22%, effective May 2015.

Furthermore, provincial legislations in Alberta, Ontario and Saskatchewan banned payday loan rollovers. In Manitoba, rollover is not completely banned. Payday lenders can continue to allow rollovers but they can only legally charge up to 5% interest on rolled over loans. British Columbia and Nova Scotia still allow the practice. In the 2011 review of the Nova Scotia Utility and Review Board, it has been determined that repeat and/or rollover loans play a detrimental role in borrower's financial well-being. This is why the Board closely monitors repeat loans by requiring licensed lenders to file annual reports containing the following data (on a per outlet basis): (a) number of repeat loans, (b) number of customers who have taken out repeat loans, and (c) number of repeat loans taken out by individual customers. According to the CPLA, rollovers – not payday loan itself – could possibly lead to usurious annual rates. After all, payday loans are intended to be for the short-term only – just to meet one-off and unanticipated expenses. This is why the association also bans its members from granting loan renewals or rollovers in order to not lead consumers to the path of insolvency.⁴

Most of the provinces also regulated payday lender's signage and advertising. Some provinces like Alberta and British Columbia require outlets to display the annual percentage rates

⁴ See CPLA's Code of Best Business Practices.

applied on these loans.⁵ This is all to provide transparency and allow borrowers to compare their financial options before taking out a payday loan. According to many credit counselling services, payday loans – due to their relatively higher rates – should be the last resort of any potential borrower.

Other common features of provincial legislations include, but not limited to: (a) cooling off period where the lender gives the borrower a day or two to cancel the loan agreement without incurring any charges; (b) no pre-payment penalty where the borrower may pay the loan amount before maturity without incurring charges; and (c) maximum amount of loan allowed to be granted which is usually a percentage of the borrower's net pay.

Some provinces like Newfoundland and Labrador and New Brunswick did not enact any payday lending legislations. Quebec does not have specific payday lending rules either but payday loans are subject to the 35% annual interest rate cap applied to any loans as stipulated in the province's Consumer Protection Act.⁶ Such rate is unprofitable for payday lenders and so there are no licensed payday lenders in the province. In Prince Edward Island, An Act Respecting Payday Loans has already been drafted but it has not been put into force yet. Essentially, the federal annual rate cap of 60% applies to payday loans in these provinces. Table 1 summarizes some of the payday lending regulations that are in effect across the provinces.

⁵ However, industry supporters claim that using APR to demonstrate the cost of borrowing for payday loans is not fair because the loans are intended for short term. Just like pricing for hotel accommodations is on a per-night basis instead of annual rates.

⁶ A main source of short-term credit in Quebec is *caisse populaire*.

3. Literature Review

Due to its controversial interest rates and the type of borrowers it serves, payday lending has been widely studied especially in the US. One central question that is sought to be answered by earlier studies is whether payday loans are beneficial to consumers in terms of providing short-term credit options or not. According to Pyper (2007) who studied the information gathered from the 2005 Canadian Survey of Financial Security, users of payday loans are ones who are financially stressed as most of them belong to low-income families whose spending usually exceeds their income. In particular, it was found that usage of payday loans among low-income families was twice as high compared to those not in low-income cutoffs – 4.6% versus 2.3%, respectively. In contrast, a recent survey conducted by Think Finance reveals that payday loans are used by American millennials – aged 18 to 34 years old – regardless of income brackets. Specifically, the survey finds that 22% of mid to high income individuals uses payday loans compared to only 15% of low income survey participants. This is why payday loan is seen to be either one of two things: (a) costly relief that may be used by any household to increase utility by smoothing consumption over time⁷ and to be steered away from bankruptcy or (b) trap that may actually ensnare people especially those who are already financially-distressed to repeat borrowing and eventually to insolvency.

Indeed, much of the research work in the early 2000s mainly revolved around finding evidence in support of either the beneficial view or the harmful view of payday lending. There are still some studies in the recent past that are aimed at this goal. However, as Kaufman (2013) mentioned, such topic is still divisive for economists and policymakers studying the industry. This might have played a significant role why various governments have enacted different laws to

⁷ See Melzer (2011).

regulate the industry. And as a consequence of this, there is a notable shift wherein much of the research work in the recent past became mainly focused at how various payday loan regulations affected consumer welfare and financial well-being. Kaufman (2013) further justifies this by claiming that a lot of the changes in consumer financial well-being are no longer due to payday loan usage itself but to varying ways governments have been regulating the industry.

The following literature review presents the studies that have provided evidence in support of either the beneficial view or harmful view in payday lending. Afterwards, it shifts to studies that look into how payday lending regulations have affected the financial well-being and welfare of those who use these loans.

3.1 Beneficial View

Studies that support the beneficial view of payday loans do not only demonstrate that payday loans enable consumers to meet sudden cash expenses. These studies also usually revolve around justifying as to why payday lenders are charging relatively higher interest rates compared to say, credit cards and other forms of short-term loan.

A notable study for example is by Huckstep (2007). The author carried out a financial analysis of seven publicly-traded payday lending companies in the US using dataset from Securities and Exchange Commission. The author compares this to that of other types of lending firms including Collegiate Funding which is especially focused on funding student loans. The author also reviewed Starbucks Corporation's financial data to provide benchmark store and regional financial ratios.⁸ The author finds that on average, profit margin of payday lenders is 3.57%. This is way below the profit margin of pawn operators (7.63%) and Starbucks (9%) for the same time period. The author also finds that for pure payday lenders, operating expenses comprise

⁸ For justifications as to why Starbucks is a good benchmark, see Huckstep (2007).

75% of gross revenues and that loan losses as percentage of outstanding loan is 25%. This is a relatively higher figure compared to 5% for commercial lenders. Finally, the author concludes that regulation of the industry should not be centered on lowering the interest rates payday lender should charge consumers because the rates are well-justified based on profitability analysis of the industry.

Wilson et al. (2010) used experimental economics tools to design a laboratory environment that replicates an economy where individuals have or do not have payday loans as credit options. With undergraduate students as their participants, the authors find that existence of payday loans increases the probability of financial survival by 31% because the loans allow individuals to meet “expenditure shocks.” Among these shocks are dentist appointment, car repairs, home repairs, and driving violation tickets. In addition, they find that individuals whose discretionary spending does not exceed 6.5% of their income and have payday loan options have greater probability of financial survival than similar respondents who do not have the loan options.

Also in support of the beneficial view, some studies find evidence to claim that payday lenders fill the demand for credit that is not sustained by mainstream banks. Smith et al. (2008) called this the spatial void hypothesis. Examining relative location patterns of alternative financial service providers in the Philadelphia region, the authors find strong support for the hypothesis that AFSPs are located in places not served by mainstream banks so that they can provide financial services especially short-term credit to those who are “financially excluded.”

A related study is that by Prager (2009) where the author modeled the number of AFSP outlets per million population for each US county as a function of various demographic characteristics. One result that is most noteworthy is that AFSP locations are significantly dependent on the population’s credit worthiness, on average. This provides another support for the

view that payday loans, along with other sub-prime credit providers, benefit consumers by filling the gap left by traditional financial institutions.

3.2 Harmful View

Studies that find evidence about the harmful effects of payday loan use are commonly focused on linking payday loans with the inability to meet financial obligations. For example, a recent work by Melzer (2011), using county-level data as well as variables from the National Survey of America's Families (NSAF), shows that improved payday loan access inhibits borrower's ability to pay important bills such as mortgage or rent, utilities, and medical bills. In particular, the author finds that difficulty in paying bills increases by five percentage points for every marginal increase in payday access.

Most studies also usually demonstrate that payday loan use increases the likelihood of repeat borrowing and eventually of filing bankruptcy. One of the first works that looked into the link between payday loan use and the incidence of bankruptcy in the US was Mayer (2004). The author analyzed a random sample of 3,600 bankruptcy filings from 2000 to 2002 in selected US counties: Illinois, New Mexico and Wisconsin. These are three out of the seven states that regulated payday lending in the most minimal way in 2000. The author tests three hypotheses by carrying out multivariate regressions. One interesting finding is that debt-to-income ratios tend to fall if the insolvent holds payday loans. The author suggests a possible explanation: though debt is a smaller percentage of income, borrowers tend to file for bankruptcy faster, even "before their time." Due to the shorter maturity dates of most of their loans, the borrowers find themselves in trouble faster and so they tend to seek help faster. Furthermore, the author finds evidence to claim that the slide to financial ruin is quicker if payday loans are rolled over.

A similar study was carried out by Berry and Duncan (2007) who focused on the Canadian setting. This is the first study in Canada that demonstrates the link between payday loans and consumer insolvencies.⁹ The authors studied a sample of bankruptcy and Division II proposals from the OSB for the years 2005 and 2006. Using analysis of variance techniques, the authors also conclude that insolvent payday loan users have relatively lower debt-to-income ratios than non-payday loan users.

Skiba and Tobacman (2009) used a rich dataset from a major payday lender in the US and matched it with public records of bankruptcy filings using individual identifiers such as name, credit scores, and social security numbers. The authors employed a regression discontinuity design to establish causal relationship between first-time payday loan applications and bankruptcy filing. Their identifying assumption is that borrowers who are “barely approved” and “barely rejected” in their first payday loan applications have similar, unobservable characteristics. So controlling for these, the authors find that payday borrowers whose first application is approved are 2.48 percentage points more likely to file Chapter 13 bankruptcy than rejected first-time applicants. Rejected first-time payday loan applicants were found to turn to other subprime credit providers such as pawnshops in order to meet their short term financial obligations. Furthermore, the authors also find empirical evidence of “patronage” where borrowers who get rejected in prime credit markets and then find available credit in subprime markets continue to patronize the latter.

A related finding is that of Stegman and Faris (2003). The authors used the 1999 and 2000 comprehensive surveys compiled by the North Carolina Commissioner of Banks to take advantage of company level information on payday lending. Their multivariate regression showed

⁹ Sarra (2008) pointed out that researchers studying the payday lending industry and consumer insolvency in Canada are faced with a major challenge in terms of data availability. Payday loan is not a separate liability type field in OSB filings. This may cause filers to report their payday debts under various liability type fields.

statistically significant evidence wherein a percentage increase in customers who borrow at least once a month generates a \$1,060 increase in payday lender gross revenues. This is why repeat borrowing is more likely to be encouraged by payday lending companies.

3.3 Effects of Payday Lending Regulations

As illustrated above, the payday lending literature is not unanimous in its findings of whether or not payday loans are actually beneficial to individuals who use them. In the more recent past, much of the empirical work in payday lending literature has turned to studying the effects of payday lending regulations. Industry regulations have evolved more recently and many researchers especially in the US exploit this fact in order to study how consumer welfare or financial capability has evolved in response.

Hynes (2012) used county-level data from 1998 to 2009 obtained from the Administrative Office of the US Courts and carried out fixed effects regressions. The author tests whether bankruptcy rate, crime rate, and landlord-tenant disputes in Florida, Maryland and North Carolina changed in response to legalization of payday lending in some US states. The author looks into bankruptcy rate as a measure of financial hardship. Since payday lending is associated to low-income, financially-distressed households, the author seeks to look into the changes in crime rates and eviction rates – which is normally due to tenants being unable to pay rent – after payday lending legalization. Results suggest a favorable view of payday lending in that, post-legalization, bankruptcy rates, crime rates and evictions suits declined. However, the evidence provides weak support for the beneficial view because the author does not find the effect to be significant in areas where payday lenders are more concentrated – those with large military families and minority groups.

Goldin and Homonoff (2013) used the National Survey of Unbanked and Underbanked Households which is a supplement to the Census Population Survey in the US. The information in this supplement survey which was collected in 2009 and 2011, allowed the authors to design a difference-in-difference framework to compare payday loan usage in states that changed their payday loan regulations to states that did not. Controlling for state and time fixed effects, the authors find that payday loan use declined by 2.5 percentage points in states that banned payday lending. Moreover, the authors find that such decline was offset by an increase in pawnshop use by 1.4 percentage points in these states. The regression results further suggest that such consumer borrowing behavior is due to traditional banks not offering small sum loans (or any loans at all) so consumers turn to alternative financial services instead.

Like the studies above, the findings of Kaufman (2013) are very interesting. The author was able to take advantage of a unique dataset from an anonymous payday lender that operates in 26 US states. The data consists of 56,143,566 payday loans made between January 2007 and August 2012. Due to the richness of the dataset, the author was able to separate the components of state regulations in payday lending and study each of their effects on incidence of delinquency and of repeat borrowing by carrying out pooled cross-states and within-states regressions. The author finds that among all the components, price cap and size cap are the ones with significantly predictive ability for delinquency. In particular, results show that delinquency increases by 0.6 and 0.4 percentage points for every \$10 increase in price cap per \$300 loan and for every \$100 size cap increase, respectively. The author finds that rollover prohibition, cooling-off periods and higher price caps are the significant predictor variables that may reduce the incidence of repeat borrowing.

In contrast to the findings of Goldin and Homonoff (2013), Priestley (2014) finds that consumers in states with stricter payday lending regulations have worse financial outcomes than borrowers in states with less stringent rules during 2008-2009. The author finds that at a time when there is limited liquidity in mainstream credit markets states like Florida, whose regulations are more restrictive compared to the control state, Texas, have negative impact on credit scores. This effect is not the case when the analysis is set in the years 2006 to 2007.

This current study seeks to contribute to existing payday lending literature in two ways. Mainly, this is the first research work, to my knowledge, that studies the effects of Canadian payday lending legislations. This research explores how the provincial legislations in payday lending affect the short-term debt-to-income ratios of insolvent payday loan users versus insolvent consumers who live in provinces where payday loans are capped under the federal annual interest rate of 60%. Secondly, unlike existing studies that employ difference-in-difference design or fixed effects estimation, this work applies propensity score matching techniques described by Becker & Ichino (2002) and Imbens (2014) to carry out program evaluation of provincial payday lending rules.

4. Data and Methodology

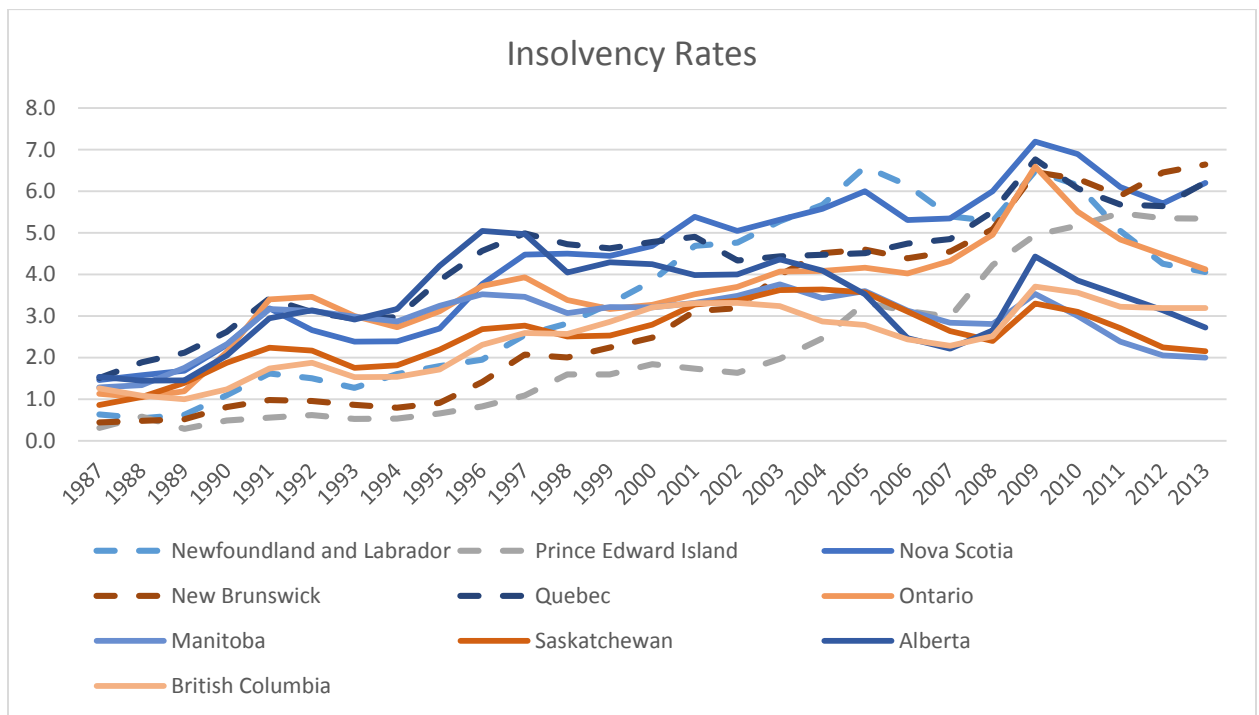
4.1 OSB Data

This study uses a dataset requested from and provided by the Office of the Superintendent of Bankruptcy. The OSB generated a random sample of 8,000 consumer bankruptcy and Division II e-filings from 2005 to 2014. Consumer bankruptcy is a legal process that can be filed by an individual who can no longer pay debts to creditors. The debtor essentially assigns all assets to a bankruptcy trustee who is tasked to sell or use the assets to help pay the creditors. Consumer

bankruptcies apply to individuals with more than 50% of total liabilities related to any consumer goods and services. It does not apply to an individual whose majority of liabilities are business-related. Division II (consumer) proposal applies to individuals having 50% or more consumer-related liabilities and less than 50% business-related. The 2009 amendments to the Bankruptcy and Insolvency Act raised the debt limit allowed for Division II proposals from \$75,000 to \$250,000.¹⁰ As in Hynes (2012), I do not have a strong theory to justify that payday loans affect the type of bankruptcy an individual will tend to file so I do not distinguish between consumer bankruptcy and Division II filings in this study.

Figure 1 graphs the annual insolvency rates – consumer bankruptcy and proposals combined – for each of the provinces.

Figure 1: Annual Consumer Insolvency Rates, by Province, 1987-2013 (Per 1,000 Population Aged 18 Years and Older)



Data Source: Office of the Superintendent of Bankruptcy

¹⁰ Division I (commercial) proposal, on the other hand, does not specify a debt limit.

It can be noted that insolvency rates for each of the provinces spiked from 2008 to 2009, with Nova Scotia reaching the highest observed insolvency rate of 7.2% at that time. Comparing the post-financial crisis consumer insolvency rates of provinces with payday lending regulations (solid lines) and provinces without such legislations (dashed lines), it is evident that those following the federal rate cap exhibit relatively higher insolvency rates. Among the provinces with payday lending rules, only Ontario and Nova Scotia have relatively higher insolvency rates similar to the provinces without the payday lending rules.

The OSB sample includes estate number, date of filing, type of filing, and variables that show demographic characteristics of the bankruptcy filers such as age, marital status, occupation, and province of residence, among others. Socio-economic characteristics include household monthly income, value of non-discretionary expenses, and value of liability categorized per type code of OSB Form 79. Table 2 lists, defines and gives the mean value of the variables from the OSB sample that are relevant for this study. The average insolvent consumer in this sample is 45 years of age with annual income of approximately \$23,195 and whose occupation belongs to NAICS category number 54 – Professional, Scientific, and Technical Services industry. The modal NAICS category is 56 – Administrative and Support and Waste Management and Remediation Services – with 36% of the sample falling under this category. Average total liabilities is \$103,593 with the maximum amount recorded being \$5.4 million. The maximum annual debtor income is only \$214,992.

Unfortunately, payday loans are not specified as a separate field on OSB Form 79. A special request to the analysts in the OSB was made to extract information on payday loan use of bankruptcy filers such as amount of payday loan and the total number of payday loans owed at the

time of filing.¹¹ The analysts used an automatic profiler software tool to match certain keywords with creditor name input for each declared liability item on the e-files. Once a match is found, it is classified as a payday loan debt. Verification was conducted in order to ensure integrity of this process. In the sample, it was found that 6.3% of insolvent consumers are payday loan holders, with the number of their payday loans ranging from 1 to 17; and the value ranging from as low as \$100 to as high as \$16,500.

The dependent variable used in the propensity score matching in this study, discussed in more detail in the next section, is total short term debt-to-income ratio of the debtor. Short term debts is comprised of every liability type on OSB Form 79 excluding mortgage debt and student loans. Short-term debt-to-income ratio is more interesting in this study because it is more likely to be affected by the payday lending legislations since payday loans have shorter maturity terms. Also, it allows the interpretation of the results to center around how an individual's capability to manage short term obligations relative to income is affected by the payday lending rules. In the random sample employed in this study, the average short-term debt-to-income ratio is 346%. The distribution is skewed to the right due to some observations having very low annual income, approximately \$0, and liabilities are exorbitantly huge. For example, the worst case in this sample is an individual with \$24 annual income in a four-member household and holds total liabilities amounting to \$58,702 at the time of filing.

The identification strategy is an extension of the findings of Mayer (2004) and Berry and Duncan (2007). While these works did not look into the effect of payday lending regulations, both find evidence to claim that debt-to-income ratios of insolvent PDL users are relatively lower compared to those of non-PDL users. Such result is intriguing because it suggests that holding

¹¹ Initially, creditor names were also of interest but the OSB does not provide such information.

payday loans tend to drive a consumer to the path of insolvency faster than not having this type of loans at all. Taking advantage of a dataset that allows for pre- and post-regulation outcomes comparison, insolvent payday borrowers in provinces that enacted payday lending legislations are used as the treatment group and insolvent consumers in provinces without payday legislations are employed as the control group.

Given the aforementioned setup, this research investigates whether payday lending rules legislated in Alberta, British Columbia, Manitoba, Nova Scotia, Ontario and Saskatchewan have increased or decreased the debt-to-income ratio of insolvent payday borrowers relative to the control group. This could indicate whether or not the rules in some provinces that are more non-restrictive to the industry tend to lead to faster financial ruin for insolvent consumers holding short-term, high-interest credit like payday loans. Such question is of relevance since it raises policy concerns especially in trying to achieve the dual aim of keeping the industry competitive and allowing consumers to access convenient, short-term credit options.

4.2 Propensity Score Matching Method

This section briefly discusses the basic idea behind Propensity Score Matching (PSM) method and how it is implemented.¹² PSM is widely applicable in various program evaluation studies where data is available to compare the outcomes of a treatment group – participants who received the treatment or intervention – to the outcomes of a control group – participants who did not receive the treatment or intervention. For example, in labor market studies a treatment could be participation in a job-training program and outcomes such as real earnings for participants and non-participants are compared.

¹² This discussion as well as the notation used follow Imbens (2014).

PSM is a popular method used in observational studies that seek to estimate the causal effect of a policy or intervention on a particular outcome. As opposed to randomized trials, treatment assignment in observational studies is nonrandom. In reality, observational studies are more common because individuals who choose to join a treatment have apparently different characteristics from those who do not participate. This may lead to selection bias if not accounted for in estimation. Initially proposed by Rosenbaum and Rubin (1983), the PSM methodology is able to reduce such bias because the process generates a propensity score. Then, each treatment unit is matched to observation(s) from the control group based on their propensity scores. Valid comparison of outcomes between the two groups is feasible, based on these matches.

Given a random sample from an infinitely large population and a treatment indicator variable $W_i = 1$ if an observation received treatment and $= 0$ otherwise, for $i = 1, \dots, N$, the realized or observed outcome variable Y_i^{obs} , with covariates X_i for unit i is:

$$Y_i^{obs} = Y_i(W_i) = \begin{cases} Y_i(0) & \text{if } W_i = 0 \\ Y_i(1) & \text{if } W_i = 1 \end{cases}$$

The *propensity score* defined by Rosenbaum and Rubin (1983) is the probability of being assigned to a treatment conditional on observed pre-treatment covariates:

$$e(x) = \Pr(W_i = 1 | X_i = x) = E[W_i | X_i = x]$$

A key idea is that these covariates are unaffected by the treatment. Generation of the propensity score is also concerned with estimating the counterfactual: an unobserved, untreated outcome $Y_i(0)$, given covariates (X_i), where $W_i = 1$, individual i was part of a treatment. Such estimation of the counterfactual, along with satisfaction of the following conditions, enables researchers to draw causal inferences in observational studies:

- **Conditional Independence Assumption:** $W_i \perp (Y_i(\mathbf{0}), Y_i(\mathbf{1})) | X_i$ – This means that for observational studies, the potential outcomes when conditioned on the covariates are

independent of treatment assignment. PSM assumes that treatment assignment ignores the potential outcomes given pre-treatment characteristics. This assumption is important so that good matches can be made and comparison of differing outcomes after treatment is reasonable.

A weaker assumption is the **unconfoundedness assumption**: $W_i \perp Y_i(0) \mid X_i$ – Unlike the CIA assumption, unconfoundedness simply assumes that treatment assignment is independent of the outcomes for the control group, conditional on the covariates.

- **Balancing Property**: $W_i \perp X_i \mid e(x)$ – This condition implies that conditional on propensity score, treatment assignment is independent of pre-treatment characteristics. In other words, treated and control units are observationally identical so that good matches can be drawn and differing outcomes are the result of treatment intervention. This can be achieved by slicing each groups into different intervals so that at every interval, the average propensity scores for the treatment and the control group do not differ.

Given that the above conditions are satisfied, the PSM methodology is carried out using the following steps.¹³ This section is then followed by a discussion of my empirical model and the estimation results.

1. **Propensity Score Generation** – Using either probit or logit techniques, the propensity scores or the predicted probabilities of joining a treatment are generated. The independent variables are chosen so that the pre-treatment characteristics that help explain the probability of joining treatment are included.
2. **Matching Methods** – Once propensity scores are generated and the additional assumptions are satisfied, the treated observations are matched to the untreated observations based on their

¹³ This discussion follows Becker & Ichino (2002).

propensity scores. The idea is to lump the observations up based on their propensity to join the treatment, instead of simply matching them based on X . The following are the four matching methods employed in this study.

- a. Nearest Neighbor Matching** – As its name suggests, this method chooses the untreated observation(s) j whose propensity score p is (are) the closest neighbor(s) of the propensity score of the treated observation i . The control unit is given by:

$$C(i) = \min_j \|p_i - p_j\|$$

A major setback of this technique is that the nearest neighbor may sometimes have a propensity score that is far different from that of the treated unit.

- b. Radius Matching** – This method improves the shortcoming of nearest neighbor matching by specifying a neighborhood or radius r around which a treated observation i is to be matched with a control observation j . This way treatment units are not matched to control units whose propensity scores largely differ.

$$C(i) = \{p_j | \|p_i - p_j\| < r\}$$

- c. Kernel Matching** – This method assigns weights to each of the control observations. The weights are inversely proportional to the distance of the control and the treated observations:

$$w(i, j) = \frac{K\left(\frac{p_j - p_i}{h}\right)}{\sum_{j=1}^{N_c} \left(\frac{p_j - p_i}{h}\right)},$$

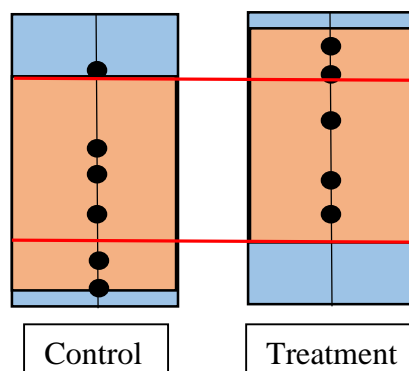
where h is an exogenous bandwidth parameter and K is the kernel function.

Thus, the method results to a matching of the score of the treated observation i to a weighted average of the scores of the control observations j – a method that also improves the shortcoming of nearest neighbor matching.

d. Stratification Matching – This method creates blocks of propensity scores where at each block, the average propensity score of the treated is the same as that of the control group. Practically, it will be the same blocks that satisfied the balancing property assumption. The matching of treated observations to the control observations is then done block by block.

Quite obviously, the four methods above will generate various matches. Carrying out each procedure provides robustness check of the estimated average treatment effects. Normally, whichever matching method is used, the **overlap condition: $0 < e(x) < 1$** is imposed in order to improve the quality of matches (Becker & Ichino, 2002). This requires that a region of *common support* is available between the treatment and the control groups. It implies that every observation i that exhibits the same characteristic X with another observation j , is allowed to have a nonzero probability of either participating or not participating in the treatment. This rules out perfect predictability of treatment assignment given the covariates (Caliendo & Kopeinig, 2005). Imposing this condition means that the region of common support is where the matches will be drawn from. Figure 1 gives graphical illustration of this condition (Katchova, 2013).

Figure 2: Region of Common Support



Finally, the last step in PSM is estimation of the average treatment effects. There are two principal parameters of interest to be estimated:

3. Treatment Effects – The goal of the procedure is to estimate the effect of the treatment such as policy implementation or program intervention on the outcome of interest.¹⁴

a. Average Treatment Effects – This is a straight up comparison of the outcomes by subtracting the mean outcome of the control group from the mean outcome of the treatment group. The estimate is unbiased if treatment assignment is random and there is no self-selection bias, then a simple t-test can be performed to evaluate statistical significance.

$$\tau_{ATE} = E[Y_i(1) - Y_i(0)]$$

However, a major challenge in estimating the ATE is the construction of both counterfactual outcomes: $E[Y_i(1)|D = 0]$ and $E[Y_i(0)|D = 1]$.

b. Average Treatment Effects on the Treated – The ATET is the parameter of interest that received most attention in evaluation literature. Unlike the ATE, it only involves estimation of one counterfactual: mean outcome of treated observations had they not received the treatment.

$$\tau_{ATET} = E[\tau|D = 1] = E[Y_i(1)|D = 1] - E[Y_i(0)|D = 1]$$

The second term on the right-hand side of the equation is the counterfactual to be estimated. Since:

$$E[Y_i(1)|D = 1] - E[Y_i(0)|D = 0] = \tau_{ATET} + E[Y_i(0)|D = 1] - E[Y_i(0)|D = 0],$$

the ATET is only identified if

$$E[Y_i(0)|D = 1] = E[Y_i(0)|D = 0].$$

¹⁴ This discussion follows Caliendo and Kopeinig (2005).

If the additional identifying assumptions discussed above are satisfied, then estimating the ATET in observational studies is feasible.

5. Estimation Results

The discussion now turns to the empirical model as well as the estimation results. As mentioned, the goal of this research is to evaluate the effects of the payday lending legislations implemented by the six Canadian provinces including Alberta, British Columbia, Manitoba, Nova Scotia, Ontario and Saskatchewan.

The identification strategy involves an extension of the findings of Mayer (2004) and Berry and Duncan (2007) where the authors find that the debt-to-income ratios of insolvent consumers holding payday loans are relatively lower than the debt-to-income ratios of insolvent consumers without payday loans. While debt-to-income ratio is high for both groups – a common characteristic of an insolvent consumer – those with payday loans seem to go insolvent faster.

In this research, I wish to extend such finding by taking advantage of the changes in regulations governing the payday lending industry. This is achieved by comparing the outcomes of a treatment group – insolvent consumers who are payday users and who live in the six provinces with payday legislations – with the outcomes of a control group – insolvent consumers from the provinces that did not change their payday lending legislations in spite of the amendments of section 347 of the Criminal Code. This control group is set up so that the observations are not subject to any provincial payday legalization and the payday loans available to them are simply subject to relatively lower APR of at most 60%.

The outcome of interest is short term debt-to-income ratio of the debtor – a financial statistic that indicates how manageable short term financial obligations are relative to annual income. While it may be interesting to see how the probability of going insolvent is affected by

the regulations, the dataset is a sample of bankrupt consumers only. It will not be possible to compare outcomes of financially-stable households. Thus, the hypothesis would revolve around how various payday lending regulations have affected the financial well-being of insolvent consumers – whether they caused faster financial ruin for insolvent payday borrowers or otherwise.

5.1 Propensity Score Generation

The first step in the PSM procedure is generation of the propensity scores or the predicted probabilities of receiving the treatment. In this study, the policy intervention of interest is the implementation of payday lending regulations by the six provinces following the amendments to section 347 of the Criminal Code in Canada. Common to all of these provincial regulations is licensing or legalization of the industry. Also, such regulations allow payday borrowers to charge relatively higher APRs than the federal cap of 60%. For instance in Ontario where the payday loan interest rate is capped at 21% for a 2-week loan, the APR before compounding and any late payment fees is $0.21 * 26 * 100 = 546\%$.

The treatment variable which is also the estimand in the probit model that will generate the propensity scores is therefore given by:

$$W_i = treatment_i = \begin{cases} 1 & \text{if debtor is PDL user, lives in AB, filed after 2010} \\ 1 & \text{if debtor is PDL user, lives in BC, filed after 2009} \\ 1 & \text{if debtor is PDL user, lives in MB, filed after 2010} \\ 1 & \text{if debtor is PDL user, lives in NS, filed after 2009} \\ 1 & \text{if debtor is PDL user, lives in ON, filed after 2010} \\ 1 & \text{if debtor is PDL user, lives in SK, filed after 2012} \\ 0 & \text{if debtor lives in NB, filed after 2007} \\ 0 & \text{if debtor lives in NL, filed after 2007} \\ 0 & \text{if debtor lives in PE, filed after 2007} \\ 0 & \text{if debtor lives in QC, filed after 2007} \end{cases}$$

Payday lending regulations only started in Canada as of 2007. Setting up the control group so that the observations come from the provinces that has never enacted legalization of the industry

even after the 2007 amendment of section 347, ensures that the control group is absolutely free from provincial policy intervention. It is a bit trickier to setup the observations that fall under the treatment group. Though the six provincial governments started drafting their regulations immediately after May 2007, effective dates vary across provinces. This is why the observation is only considered to have received the treatment if the consumer bankruptcy and Division II proposal was filed only after the effective dates for each of the provinces. Comparing the stylized facts of insolvent consumers who fall in the treatment group versus corresponding consumers who filed for bankruptcy or proposal prior to the provincial effective dates, it is noted that the groups do not differ significantly. Average age of those who fall in the treatment group is 44 whereas for those who were not considered to be in the treatment group, the average age is 39. For both groups, on average, 25% of them are married and 5% are retired. For the treatment group, 10% is unemployed whereas this figure is only 6% for those not considered in the treatment group. The average payday loans held is 2 for both groups; and the average value is approximately \$1,800 for the treatment group and approximately \$1,600 for the other group. Finally, the short-term debt-to-income ratio of the treatment group is 145% whereas this is 155% for the latter group.

In sum, this study defines recipient of the treatment as being a debtor who holds payday loans at the time of filing, and filing happened after payday lending legalization has been implemented in the debtor's province of residence. From the dataset, 2,104 filers fall in the control group and 177 filers are included in the treatment group. This gives a good ratio since 92.24% of the sample can be used in order to create matches for the 177 treatment observations.

Table 3 provides summary statistics of the treatment and the control group. Apparent differences can be noted. The mean debt-to-income ratio of the treatment group (145%) is less than half of that of the control group's (333%). It is also apparent that payday loans do not take a

huge percentage of monthly income (1%) for the control group whereas for the treatment group, the loans take up to 77% of debtor’s monthly income, on average. As a percentage of total liabilities, payday loans are on average only 0.05% and 7% for the control and treatment group, respectively. In terms of average demographic characteristics, the control group is twice as likely to be unemployed and retired relative to the treatment group. The mean annual debtor income and non-discretionary expenses of PDL users are approximately \$7,000 and \$1,400 higher than the control group, respectively. It is therefore a must that the balancing property be achieved in order to draw good matches so that differences in outcomes – short-term debt-to-income ratios – are attributable to the legalization and regulation of payday lending and not to these differing characteristics. The probit estimation of the propensity scores is given by:

$$\Pr(\textit{treated}_i) = \beta_0 + \beta_1 \textit{age}_i + \beta_2 \textit{married}_i + \beta_3 \textit{unemployed}_i + \beta_4 \textit{retired}_i \\ + \beta_5 \textit{expenses}_i + \beta_6 \textit{mortgage}_i + \beta_7 \textit{student}_i + u_i$$

The estimators include demographic characteristics, non-discretionary expenses, and long-term financial obligations of the insolvent consumer at the time of filing. Long-term loans such as mortgage and student debts are interesting to add as explanatory variables to see whether they increase or decrease the likelihood of receiving treatment, *i.e.* using payday loans after enactment of the regulations. The probit coefficients are reported in Table 4. All coefficients, except for age and student loans are statistically significant. The effect of non-discretionary expenses, mortgage loans and student loans are minuscule, whereas being married, unemployed and retired are strong predictors of the probability of using payday loans or propensity to receive the treatment. In particular, the probability of receiving treatment increases by about 16% if the insolvent is married.

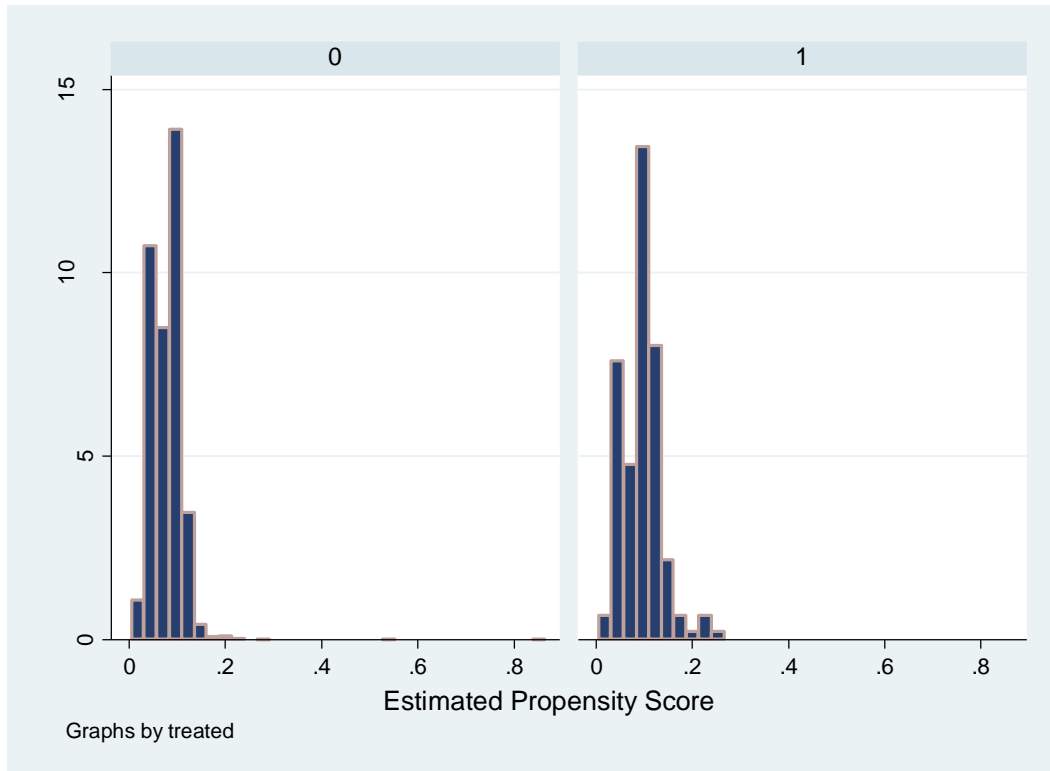
If the consumer is unemployed the propensity decreases by approximately 33% and by 36% if retired.

5.2 Balancing Property and Common Support

In generating the propensity scores, the algorithm also tests the assumption of balancing property. In observational studies, it is important to satisfy this assumption in order to ensure that given a propensity score, treatment exposure is randomized (Becker and Ichino, 2002). Balancing the characteristics of the treated and control units provides a basis for drawing causal inference between the treatment intervention and the differing outcomes.

Figure 2 shows the distribution of the propensity scores for each group. For both groups, it is evident that the predicted probabilities are positively-skewed. However, the distributions are not perfectly identical which may lead to bad matches should the balancing assumption be unsatisfied. Consequently, causal inference will be unreliable.

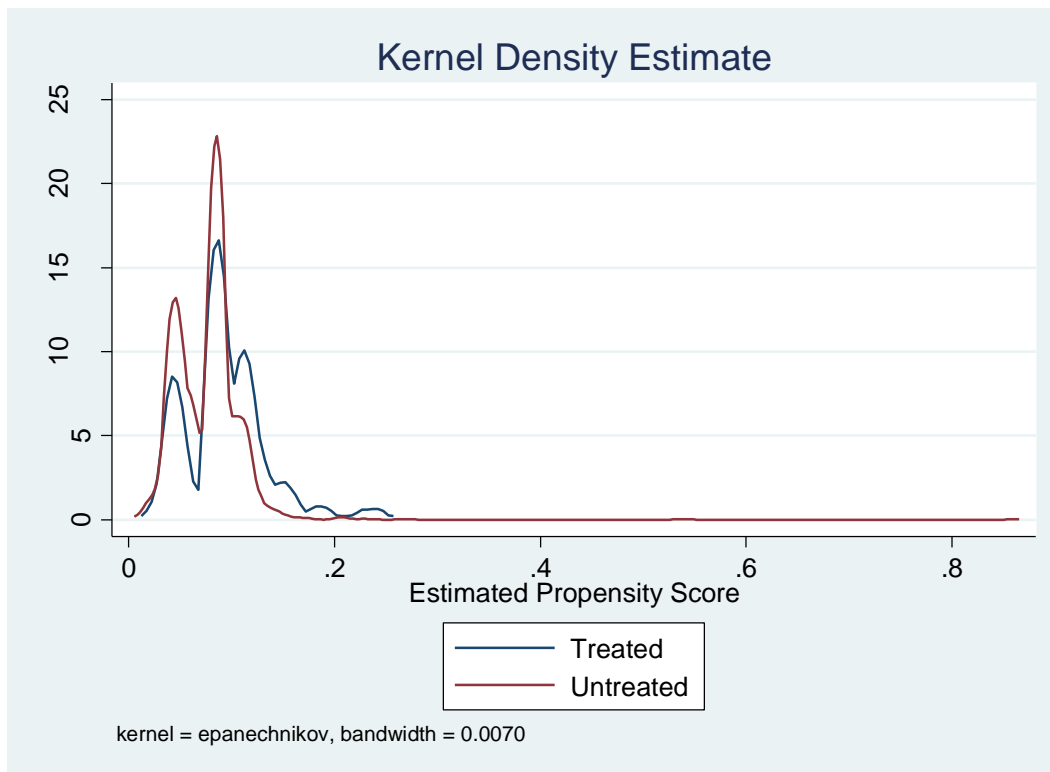
Figure 3: Distribution of Propensity Scores



In this model, the balancing property of the propensity scores is achieved in four blocks as reported in Table 5. This simply means that the estimation procedure needed to split the treatment and the control groups into four intervals so that at every interval, the average propensity score does not differ between the treated and control groups.

Figure 3 is an alternative graph that shows the kernel density of the propensity scores of each group. It is evident from here that there is ample region that is common to both groups. To be more precise, this region is bounded from 0.0196 to 0.2. The algorithm that tested the balancing property was restricted to this region of common support. Consequently and to improve the quality of matches (Becker and Ichino, 2002), the common support condition is also imposed in the next step which is the estimation of the average treatment effects.

Figure 4: Common Support Region



5.3 Average Treatment Effects on Treated (ATET)

All four matching procedures discussed in section 4.2 were employed to estimate the ATET. In addition to this, simple and multivariate regressions were conducted to carry out simple t-tests. The results are reported in Table 6. Both OLS results show negative and statistically significant relationship between the treatment variable and debt-to-income ratio. However, causal inference from these methods is impossible and unreliable since they ignore everything discussed in section 4.

Due to differences in procedure, the four matching methods generated varying number of matches – with radius matching method generating the least number of matches of 10. Nearest neighbor, kernel and stratification matching methods generated matches for all 177 treatment units

but nearest neighbor made use of 464 control units only. Both kernel and stratification methods used all of the 2084 control units to generate matches and calculate the average treatment effects.

The four matching methods all agree and show that the treatment affected debt-to-income ratios negatively. Though the magnitude of the effect varies from one procedure to another, all estimated ATETs are statistically significant. The policy intervention being studied here – legalization and freeing payday loan APR from the federal rate cap of 60% – caused short-term debt-to-income ratios for insolvent payday borrowers to fall by -1.17, -3.25, -1.87 and -2.58 points when nearest neighbor, radius, kernel and stratification matching procedures are used, respectively.

This result suggests that the provincial legislations may actually have been detrimental to payday borrowers. It puts forward the idea that allowing payday lenders to be licensed and to be legally profitable through charging dramatically high APRs cause payday borrowers to file for insolvency even when their short-term debt-to-income ratios are relatively lower. In spite of the provincial governments' attempt to regulate the payday lending industry, users of payday loans still find themselves going to the path of insolvency faster than their counterparts from provinces following a stricter interest rate cap of 60%. Such result either does not paint a very favourable picture of the payday lending practice or is suggestive that the regulations in place in the provinces of Alberta, British Columbia, Manitoba, Nova Scotia, Ontario, and Saskatchewan that are more accommodating to the industry may only be achieving one side of their dual aim. While these regulations may be keeping the payday lending industry competitive and profitable, such regulations seem to fail from preventing consumers be enmeshed in short-term, high interest credit obligations that lead to insolvency.

On the other hand, these results can also be viewed positively. For instance, from a credit counselling agent's standpoint, this could be a good thing because the regulations are causing payday borrowers to seek help before they acquire more short-term debts to write off – when it is more difficult to manage their total short-term liabilities. This explanation is more difficult to show empirically, however, due to the innate factors influencing the individual's decision to seek financial help and/or bankruptcy protection.

The Rollover Phenomenon

As discussed in section 2.2, a controversial feature of the payday lending practice that received a lot of policy and research interest is the rollover phenomenon. Defenders of the rollover practice claim that it is the optimal choice when the payday borrower is faced with the challenge of not having enough cash or funds to pay the loan back at maturity. Banning rollover will force such borrower to try and get loan somewhere else which may lead to another set of transaction fees and charges. Incurring NSF charges may also lead to higher debt obligation compared to simply allowing the lender to rollover the loan. On the other hand, critics say it is rollover option that mainly encourages repeat borrowing and accumulation of more financial liabilities and eventually this leads to consumer insolvency.

Among the six provinces that legislated their own payday lending rules, three provinces completely banned the practice. These are Alberta, Ontario and Saskatchewan. Manitoba does not prohibit rollover, rather it chose to set the interest rate payday lenders can charge for granting rollovers at 5%. British Columbia and Nova Scotia still allow payday loan rollovers but they implement strategies to closely monitor the practice.

Taking advantage of these differences in regulating rollover, I carry out another PSM experiment to compare the outcomes of insolvent payday borrowers in provinces where rollover

is allowed (treatment group) to the outcomes of insolvent payday borrowers whose respective provincial legislations banned this option (control group). This secondary test supplements the first test where results show support of the harmful view of payday lending. Such view is also against payday rollover. So if rollover indeed does more harm than good for payday borrowers, this second test should show that those who are allowed to rollover their loans go insolvent even faster than payday borrowers who are not given this option.

Table 7 reports the findings. The results show negative estimates of the ATET, with the magnitude of the effect ranging from -0.09 to -0.39. This suggests that legally allowing rollovers actually lead payday users to the path of insolvency faster than corresponding users who are not permitted to rollover. While this negative effect is observed consistently, none of the coefficients are statistically significant. This is possibly due to few data points available to generate matches of the treatment and control units. So while considering the estimates jointly may lead to claiming payday rollover indeed exacerbates the harmful effects of payday loan provision, the data is unable to back this up statistically.

5.4 Robustness Check

As reviewed by Becker & Ichino (2002), considering the estimates produced by the four different matching methods jointly offers robustness check. Indeed, the negative effect estimated in this work is robust to alternative matching methods used. To provide further robustness check, alternative definitions of the dependent variable and of the control group were used and the same estimation procedure was applied. The results are reported in Table 8.

Firstly, the dependent variable is tweaked so that total unsecured debts as a percentage of the insolvent consumer's annual income is used instead of total short term liabilities. This re-definition of the estimand still results to negative ATET estimates. The magnitude of the effect is

relatively lower, ranging from -0.709 to -0.759. These estimates are statistically significant when nearest neighbor, kernel and stratification matching procedures are used. These three methods were able to match all 177 treatment units. On the other hand, radius matching was able to match 8 treatment units only. This resulted to a more conservative estimate of -0.593 which failed to show statistical significance.

Another robustness check employed was re-defining the criteria for control units. This was done in two ways. The first one draws controls from insolvent consumers not subject to payday lending regulations in their provinces prior to the 2007 amendments to section 347. This also coincides with pre-financial crisis period, when Canadian household debt-to-income ratios were relatively lower compared to post-crisis times.¹⁵ In fact, the mean debt-to-income ratio for this group is 7% lower than the mean ratio of the original control group. The treatment group is unchanged. This re-definition results to fewer control units used to create the matches. Still the estimated ATETs are consistently negative across all matching methods, with the magnitude of the effect ranging from -0.585 to -1.334. The estimates are mostly statistically significant at the 10% level except for the radius matching ATET. Again, the statistical insignificance of this estimate is possibly due to the algorithm only matched 30 treatment units which is too few to draw statistical inference from.

Second redefinition of the control group is drawing the units from the whole sample, disregarding whether bankruptcy or Division II proposal was submitted before or after the 2007 amendments. Without implementing changes in provincial payday lending regulations, this redefinition of the control group is justifiable. As before, the effect is estimated to be negative,

¹⁵ See Statistics Canada CANSIM Table 378-0123.

ranging from -0.797 to -2.205, with strong statistical significance at the 1% level – largely because more treatment units were matched to more control units.

6. Conclusions

The 2007 amendments to section 347 of the Criminal Code of Canada allowed the provincial governments to enact their own payday lending legislations that they deem fair for both the industry and consumers. Due to the divisiveness of earlier empirical research, these governments have regulated the payday lending industry in various ways – some more stringently than others. At this point in time, when the industry has already grown tremendously relative to its establishment in the 1990s, the two contrasting theoretical views are well-defined. Critics argue that this type of loan is a vehicle that enmeshes users to a dangerous cycle of debt and to the path of insolvency. This led to applying the federal legislation that caps annual percentage rate on these loans at 60% - a rate that may deem unprofitable for some payday lenders due to the higher debt losses and operating expenses they incur. Industry supporters claim that such loans are purposeful credit options that cater to the credit-constrained and the financially-excluded to enable them to absorb expenditure shocks and to smooth consumption. This view led to some governments allowing payday lenders to operate as long as they adhere to licensing rules, interest rate caps, among other regulations.

These varying reactions of governments on the regulation of payday lending may have caused the notable shift in recent empirical work. The interest is not so much focused on finding evidence whether payday loans are causing beneficial or harmful financial effects to those who use them. Rather, much of the policy interest now seeks to examine which of the regulations is most effective in terms of eliciting positive effects to payday borrowers. As Kaufman (2013) points

out, due to these varying regulations, a lot of the financial outcomes of payday borrowers may no longer be attributable to payday loan use but perhaps on the regulations themselves.

This research takes advantage of the differing provincial payday lending regulations in Canada to evaluate their effects on indicators of financial capability – short-term debt-to-income ratio – of those who experienced financial distress using propensity score matching methods. Results are significantly in favor of the view that regulations freeing the loans from the conservative annual interest rate cap of 60% and legalizing payday lending cause payday borrowers to go insolvent faster. Their slide to financial ruin is much quicker – with their short-term debt-to-income ratios falling by -1.173 to as much as -3.245 – than those who live in provinces applying the federal anti-usury law on these loans. This result is statistically significant and is robust to any matching method employed and redefinition of either the dependent variable or the control units.

This suggests support for the harmful view of payday lending. In spite of the regulations in place which still allow payday lenders to profitably charge controversial interest rates on the loans, payday borrowers whose loans incur higher interest rates at shorter maturity terms, decide to go insolvent faster than any other insolvent consumer. To further test if the harmful view is indeed supported, a secondary experiment is carried out to supplement the above findings. The second model tests whether allowing payday loan rollover leads to faster financial ruin. Results suggest a negative effect of allowing rollovers on debt-to-income ratios of insolvent payday borrowers, with the magnitude of the effect ranging from -0.098 to -0.392. This proves that legally allowing accumulation of more short-term, high-interest loans may prove detrimental to one's financial health. Though this effect is consistent and is robust to alternative matching methods, I failed to find the effect to be statistically significant using my dataset. Because this is only based

on a few propensity score matches, the data does not back up the negative estimated effects of rollover very well.

On balance, the empirical model suggests evidence for the harmful view of payday lending since in spite of regulating the industry, payday users still seek for insolvency protection faster. The task of placing regulations that meets the dual aim of keeping the industry competitive and helping users avoid financial trouble remains a challenge for policy analysts. However, I also recognize that to some analysts the results can be interpreted in a more optimistic fashion. For example, from a credit counselling agent's standpoint, lower debt-to-income ratios could imply that the insolvent lands to financial ruin more softly and bouncing back financially is relatively less strenuous. When seeking for help happens as early as possible, managing the assets and liabilities is less difficult as there will be less debts to write off. This in turn benefits both the consumer and the creditors and is better for the economy as a whole.

Recommendations

Of course I also recognize that the results in this study can be improved. The PSM methodology can be developed by carrying out a propensity score matching difference-in-difference (PSM-DID) estimation if it is possible to generate a differenced estimand. For example, if previous year's earnings and liabilities are available so that the dependent variable is a differenced debt-to-income ratio so that time effects are accounted for.

As demonstrated in section 3, the empirical literature in payday lending may have shifted towards a different policy interest, but sorting out the causal effect between payday loan use and Canadian consumer insolvency remains to be an area of research worth tackling. With more detailed data than the one used in the current work for example, one may want to sort out whether

the accumulation of huge credit card balances happened before taking payday loans. This enables estimation of other counterfactual scenarios. It may allow causal inferences such as that the incidence of bankruptcy is highly likely with or without payday loan rollover provision, and that allowing rollover will simply delay the filing.

On a related note and as pointed out by Stan Keyes, President of the CPLA, some insolvent consumers use payday loans so that they can pay bankruptcy trustee fees. This in turn leads them to declare that they are indebted to a payday lender at the time of filing. However, it could lead some researchers and policy makers studying the industry to erroneously interpret holding such loans is causing bankruptcy instead of simply facilitating the filing. Unfortunately these issues cannot be sorted out when using data from the OSB because Form 79 does not ask the debtor the reason for taking out payday loans or other type of debts, for that matter. Neither does it require the debtor to indicate how far back each of the debts were incurred relative to the filing. Perhaps the Canadian Financial Capability Survey may offer solution by following up with the reason for taking out a payday loan when it asks the survey participants whether or not they took out payday loans in the last 12 months and whether or not such action immediately preceded bankruptcy filing.

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8. Tables

Table 1: Comparison of Canadian Provincial Regulations Governing Payday Loans

Province	Cost per Hundred	Default Fee	Maximum Interest in Arrears (per annum)	Rollovers	Effective Date	Document
AB	\$23	\$25	30%	Prohibited	03-2010	Fair Trading Act 2009
BC	\$23	\$20	30%	Monitored	11- 2009	BC Reg 57/2009
MB	\$17	\$20	30%	Allowed**	10-2010	Payday Loans Regulation 99/2007
NB	-	-	-	-	-	-
NL	-	-	-	-	-	-
NS*	\$22	\$40	60%	Monitored	05-2015	Bill 114 - Consumer Protection Act
ON	\$21	\$50	60%	Prohibited	12-2010	Payday Loans Act 2008
PEI	\$25	Reasonable charge	60%	Prohibited	Imminent	Payday Loans Act 2009
QC	-	-	-	-	-	-
SK	\$23	\$20	30%	Prohibited	01-2012	Payday Loans Act 2012

*Nova Scotia effected its first set of regulations in August 2009 when it implemented an interest rate cap of 31%. The province revised its regulations in April 2011 when the interest rate cap was reduced to 25%.

** Interest rate charged on rollover loans is regulated and capped at 5%.

Data: Collected from reviewing each province's payday lending regulations.

Table 2: Definition of Variables

Variables	Definition	Mean
Age	Age of filer at the time of filing	45
Married	=1 if filer is married, 0 otherwise	31%
Unemployed	=1 if filer is unemployed, 0 otherwise	15%
Retired	=1 if filer is retired, 0 otherwise	8%
Expenses	Monthly non-discretionary expenses declared by filer, multiplied by 12 months	\$1,475
Mortgage	Mortgage debt of filer	\$44,209
Student	Student loans of filer	\$1,568
Annual Debtor Income	Annual total income of filer	\$23,195
Total Liabilities	Declared total short-term liabilities of filer	\$103,593
Debt-to-Income	Total short-term liabilities divided by annual debtor income	4.15
PDL user	=1 if debtor holds payday loan at the time of filing, 0 otherwise	6.3%
Unsecured Debt-to-Income Ratio	Unsecured short-term liabilities divided by annual debtor income	2.58

Data: Random sample of bankruptcy and Division II proposal e-filings provided by the Office of the Superintendent of Bankruptcy.

Table 3: Summary Statistics

Variables	Mean, Untreated	Mean, Treated
Age	45	44
Married	22%	25%
Unemployed	19%	11%
Retired	10%	5%
Annual Non-discretionary Expenses	1,188.97	2,573.74
Mortgage Debt	35,335.72	23,319.59
Student Loan	1,515.69	2,665.27
Annual Debtor Income	22,433.93	29,147.39
Short-term Liabilities	59,100.79	36,750.94
Debt-to-Income Ratio	3.33	1.45
PDL use	0.01	1
Unsecured Debt-to-Income Ratio	2.23	1.42
Payday Loan (% of Monthly Income)	1%	77%
Payday Loan (% of Liabilities)	0.05%	7%
No. of Obs	2104	177
Percent	92.24%	7.76%

Data: Random sample of bankruptcy and Division II proposal e-filings provided by the Office of the Superintendent of Bankruptcy.

Table 4: Propensity Score Generation

Variables	Probit Coefficients
Age	-0.001 (0.004)
Married	0.155* (0.094)
Unemployed	-0.327*** (0.117)
Retired	-0.358** (0.185)
Expenses	0.00002*** (5.89e-06)
Mortgage	-1.69e-06*** (6.00e-07)
Student	7.62e-06 (4.83e-06)
Constant	-1.345*** (0.159)
Observations	2281
Log-likelihood	-604.96
LR chi-sq.	34.88***

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5: Balancing Property of Propensity Score

Inferior of Block of P-Score	Number of Observations		
	Control	Treated	Total
0.0195557	1764	108	1872
0.1	305	56	361
0.15	8	9	17
0.2	7	4	11
Total	2084	177	2261

The balancing property is satisfied. Region of common support (0.01955565, 0.24998823)

Table 6: Average Treatment Effect on the Treated

Estimation Method	Treatment	Control	ATET	Std. Error (Bootstrapped)	<i>t</i>	<i>Significance</i>
T-test (simple regression)	-	-	-1.875	0.758	-2.47	Yes***
T-test (multivariate)	-	-	-1.916	1.025	-1.87	Yes**
Nearest Neighbor	177	464	-1.173	0.434	-2.705	Yes***
Radius Matching	10	1967	-3.245	0.780	-4.161	Yes***
Kernel Matching	177	2084	-1.869	0.957	-1.953	Yes***
Stratification Matching	177	2084	-2.584	1.951	-1.324	Yes*

Robust standard errors are reported for the OLS regressions.

Table 7: Average Treatment Effect on the Treated (Rollover)

Estimation Method	Treatment	Control	ATET	Std. Error (Bootstrapped)	<i>t</i>	<i>Significance</i>
T-test (simple regression)	-	-	-0.035	0.398	-0.09	No
T-test (multivariate)	-	-	-0.014	0.396	-0.04	No
Nearest Neighbor	46	37	-0.382	1.349	-0.283	No
Radius Matching	8	110	-0.392	0.530	-0.739	No
Kernel Matching	46	114	-0.165	0.464	-0.356	No
Stratification Matching	46	114	-0.098	0.481	-0.204	No

Robust standard errors are reported for the OLS regressions.

Table 8: Average Treatment Effect on the Treated (Robustness Check)

Estimation Method	Treatment	Control	ATET	Std. Error (Bootstrapped)	<i>t</i>	Significance
A: Unsecured Debt-to-Income Ratio – Outcome Variable						
T-test (simple regression)	-	-	-0.812	0.311	-2.61	Yes***
T-test (multivariate)	-	-	-0.623	0.304	-2.05	Yes**
Nearest Neighbor	177	471	-0.709	0.333	-2.127	Yes***
Radius Matching	8	2010	-0.593	0.492	-1.206	No
Kernel Matching	177	2084	-0.738	0.226	-3.267	Yes***
Stratification Matching	177	2084	-0.759	0.253	-3.000	Yes***
B: Pre-Crisis Period – Control Group						
T-test (simple regression)	-	-	-1.648	1.152	-1.43	No
T-test (multivariate)	-	-	-0.701	0.506	-1.39	No
Nearest Neighbor	177	207	-0.585	0.391	-1.495	Yes*
Radius Matching	30	596	-1.334	1.219	-1.094	No
Kernel Matching	177	631	-0.966	0.596	-1.621	Yes*
Stratification Matching	174	634	-1.010	0.698	-1.447	Yes*
C: Full Sample – Control Group						
T-test (simple regression)	-	-	-1.822	0.660	-2.76	Yes***
T-test (multivariate)	-	-	-1.640	0.776	-2.11	Yes**
Nearest Neighbor	177	585	-0.797	0.326	-2.449	Yes***
Radius Matching	55	2056	-2.205	0.891	-2.475	Yes***
Kernel Matching	177	2715	-1.782	0.677	-2.632	Yes***
Stratification Matching	176	2717	-2.061	0.963	-2.139	Yes***

Robust standard errors are reported for the OLS regressions.