



Is there any dependence between consumer credit line utilization and default probability on a term loan? Evidence from bank-customer data



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ABSTRACT

We study the relationship between two financial instruments through the simultaneous analysis of personal credit line utilization and default probability on a personal term loan. We model both dependent variables in a system of simultaneous equations and find strong evidence of dependence between the two financial instruments. Individuals in the default state draw their credit line by 9 percentage points more and, depending on the specification, a 10 percentage point increase in credit line utilization decreases the default probability by 0.09 to 0.41 percentage points, on a base default rate of 1.08%. This provides evidence that borrowers may use the liquidity of the credit line to pay down the term loan in periods of financial distress and suggests that banks should manage both financial instruments simultaneously.

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1. Introduction

Consumer finance has been neglected for many years in the economic and finance literature (Campbell, 2006; Campbell et al., 2010; Tufano, 2009). The recent financial crisis clearly shows that consumer financial services are not well managed, and deserve further study. New instruments have been made available to consumers in the past few decades and, of all household financial products, revolving lines of credit have grown the most in recent years.

The Statistics Canada 2005 Survey of Financial Security (Statistics Canada, 2006) reports that credit lines accounted for 9.0% of total household debt in 2005, versus 5.7% in 1999 – an increase of 133%. In 2005, personal credit lines were the most prevalent type of debt after real estate mortgages, which accounted for 75.3% of total household debt.² These numbers are consistent with an upward trend

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² According to this study, the total amount of debt on credit cards and installment credit has risen by 58.4% (to 3.4% of total family unit debt in 2005) during the same period, the second largest increase after that of credit lines.

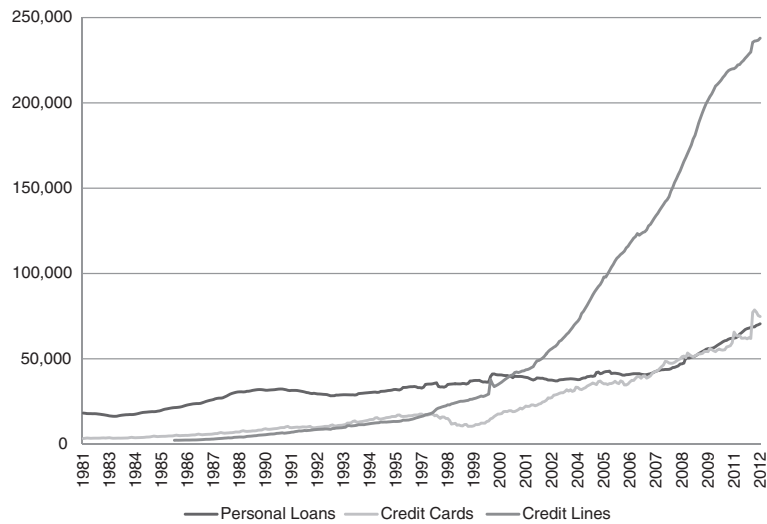


Fig. 1. Assets of Canadian Chartered Banks (\$ million), 1981–2012. The figure plots the monthly average value (in \$ million) of personal loans, credit cards, and credit lines for Canadian Chartered Banks from 1981 to 2012. The data come from the series v36867, v36868 and v36869 of CANSIM and do not include information concerning mortgages.

in consumer lines of credit, which started in the 1990s. Fig. 1 shows the assets of Canadian chartered banks used for consumer credit (excluding mortgages) between November 1981 and March 2012.³ Since 1997, the total value of lines of credit has increased dramatically, far exceeding the total value of personal loans. In March 2012, the portion of assets dedicated to personal lines of credit was the largest, almost twice the value of credit card and personal loans combined. Similarly, personal revolving credit utilization has risen sharply in the US since the mid-1990s. According to the Federal Reserve (FRB: G.19),⁴ in March 2012 outstanding revolving credit for consumers totaled \$803.6 billion, representing 31.61% of the total outstanding consumer debt. The recent growth of revolving debt products should impact consumer financial distress significantly, and may have spillover effects on conventional credit instruments.

In this paper, we exploit a proprietary dataset composed of retail borrowers at a leading Canadian institution to analyze the interaction between revolving credit utilization and default on a term loan. Our data allow us to focus on individuals who already have both a revolving line of credit and a term loan. The two dependent variables we study are the percentage of the credit line drawn down relative to the commitment amount of the bank and the default state on the term loan. We analyze both variables in a simultaneous equation model in which default probability on the loan is modeled by an instrumented probit regression, and credit line utilization is modeled using linear and non-linear instrumental specifications (OLS, fractional logit and zero-one inflated beta regressions).

We hypothesize that both financial instruments are used simultaneously and seek to quantify the dependence between them. Being in default on a term loan signals an idiosyncratic shock to liquidity that may ultimately translate into excessive credit line utilization. We therefore expect a term loan default to affect credit line drawdown positively. Conversely, the effect of credit line utilization on term loan default is ambiguous. On the one hand, a borrower facing financial distress might use the liquidity provided by the credit line to pay back the loan, effectively reducing the default probability. On the other hand, if higher credit line utilization is associated with bad risk borrowers, it may correlate positively with the default probability on the term loan. Both cases are possible because the bank is committed to the total amount of credit line whatever the evolution of credit risk. Banks should carefully monitor the interaction between the two financial instruments for signals of credit quality deterioration, which could lead to better risk management of the loan portfolio if corrective measures are taken early.

To deal with endogeneity in the system of equations, we instrument both the default state on the term loan and the percentage of the credit line drawn down. The fact that these two financial products are currently treated independently by the bank guides our search for valid instruments. To instrument for credit line utilization, we use the number of months since the credit line account was opened and a dummy variable indicating the presence of collateral on the credit line. Because the financial products are treated independently by the bank, the presence of collateral on the line does not lead to strategic default behavior on the term loan. Further, given that the number of months since the credit line account was opened depends exogenously on the passage of time, there is no reason to believe it could affect the probability of default on the term loan. To instrument for the default state on the term loan, we use the remaining term on the loan and the presence of collateral on the term loan. The same arguments hold for the validity of these instruments. The presence of collateral on the term loan does not affect the liquidity needs of the borrower, and the remaining term on

³ Source: Series v36867, v36868 and v36869 of CANSIM.

⁴ Federal Reserve Statistical Release G.19, available online: <http://www.federalreserve.gov/releases/g19/current/g19.htm>.

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