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The Persistence of the 2008-2009 Recession and Insolvency Filings in Canada

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Abstract

During the 2008 economic downturn, Canada experienced at a very early stage, a significant increase in consumer insolvency filings that seems to last indefinitely, even in the presence of satisfactory macroeconomic fundamentals. This situation contrasts with the long-standing assumption on the main function of consumer insolvency filings as a last resort insurance against hazards that can affect consumers' consumption. This paper investigates the role of the persistence of the great recession on consumer insolvency filings in Canada to observe that insolvency filings follow a self-driving process. It further observes that, although consumer insolvency filings remain very high long after the crisis, the persistence of the latter disappeared after fourteen months, and therefore cannot be accounted for the rise in insolvency filings that persisted long after the recession in Canada.

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1. Introduction

As a last resort insurance on consumption, consumer insolvency filings play an automatic stabilizer role in the economy and in so, increase during economic downturns to sustain consumption by relaxing consumer's budget constraint. For Athreya (2004), consumer insolvencies can augment, substitute for or even limit other forms of insurance against life's vicissitudes, as the latter can have the same effects on the former. However, economic crises always bring about high unemployment rates which oftentimes limit consumer's ability to service their debts while maintaining a reasonable consumption level. In fact, Sullivan et al. (2000) and Domowitz and Sartain (1999) observe that those who have recently experienced lost of employment form more than two thirds of insolvency filers. Therefore, the unusual long waiting period for the first employment insurance paycheque may explain why insolvency filings started to increase right after the recession broke[1]. Moreover, during the 2008-2009 recession in Canada, the unemployment rate reached 8.7%[2], which seems weighed heavily on insolvency filings.

Contrary to the other forms of welfare programs which are restricted to a handful of qualified citizens, the accessibility to the insolvency system in Canada only requires of the filers to be insolvent. While the level of consumer's entitlement to these other forms of insurance can be an indication of how quick they have recourse to the insolvency system, it is not known how long the effects of the economic crisis lasted on insolvency filings which remains very high long after the end of the last recession. In this paper, we investigate the memory of a shock affecting insolvency filings in Canada to understand whether the 2008-2009 recession can be accounted for the high insolvency volumes observed long after Canada was officially declared out of the recession.

This paper contributes to the literature by providing the rationale as to why the rise in insolvency filings cannot be explained by an approach solely based on either insolvency stigma or microeconomic or macroeconomic factors, as it is currently the case in the literature. As long insolvency filings are concerned, we have found that insolvency volumes in Canada follow an autonomous process – driven probably by the insolvency stigma – that might only be exacerbated by micro and macroeconomic factors during an economic turmoil.

This paper is organized as follows. Section 2 provides a review of the literature. Section 3 succinctly analyzes the trends in the macroeconomic variable and insolvency filings in Canada. Section 4 looks at the data used to conduct the analysis. Section 5 presents the results and section 6 concludes.

2. Literature Review

Whether it involves personal or corporate dealings, there is a relatively well-established literature on the relationship between the macroeconomic conditions and insolvencies. The rationale for this narrative is rooted in the inability of individuals or corporations to meet their financial obligations under specific economic environments. For instance, economic slowdowns have adverse effects on employment, which in turn affect the ability of both individuals and corporations to generate income to fulfill their financial obligations as they become due.

However, on the personal side, despite this well-articulated narrative, the facts are not always forthright, as the results are oftentimes mitigated. While a significant number of papers establish

[1] Employment and Social Development Canada (2016). Evaluation of Employment Insurance (EI) Automation and Modernization (2001-2002 to 2011-2012): Final report.

[2] Statistics Canada, Table 282-0087 – Labour Force Survey estimates (LFS), by sex and age group.

a clear relationship between macroeconomic factors and insolvencies (see: Hendershott and Schultz 1993; Deng et al. 2000; Livshits et al. 2010; Agarwal et al. 2003; Garrett and Wall 2014), others like Elul and Subramanian (2002); Fay et al. (2002); Fisher (2005); Himmelstein et al. (2005) and White (2009) conclude otherwise. For instance, where Fay et al. (2002); Fisher (2005) and White (2009) observe that bankruptcy decision is not related to local unemployment rates and decreases in average income, numerous surveys of bankruptcy filers find a causal relationship between bankruptcies and unexpected negative shocks to household income, such as job loss. In contrast with Repetto (1998) and Sullivan et al. (2000) who analyze two different surveys to find loss of jobs as the main cause of their bankruptcy filing, Himmelstein et al. (2009) on their part observe that more than half of bankruptcy filings in the US are the result of the lack of medical insurance following a serious injury or illness.

In line with numerous theoretical models, including that of Rampini (2005), which observe that personal bankruptcies are counter-cyclical, Garrett and Wall (2014), use state-level data for the US to find a personal-bankruptcy cycle for which the rate of personal bankruptcies rises above its trend rate throughout the length of a recession. They further observe a hangover in which bankruptcy rates begin to fall, but remain above trend for several more quarters after the recession ends. These results confirm in every aspect earlier findings by Deng et al. (2000); Grieb et al. (2001); Agarwal and Liu (2003) who indistinctly conclude that unemployment leads to a rise in delinquency and bankruptcy rates.

Other studies focus instead on the increased access to credit to understand how it interacts with insolvencies (see Chatterjee et al. (2007) and Livshits et al. (2007). In this respect, Herkenhoff (2014) explains that increased access to credit allows households to smooth consumption and prolong job searches, and as a result, inducing deeper and longer recession. For their part, Nakajima and Rios-Rull (2014) analyze the interaction between unsecured credit, bankruptcies and business cycle to observe that unsecured credit is procyclical and bankruptcies countercyclical. In fact, these results seem to lead to the conclusion that insolvency, being a consequence of high indebtedness, is unavoidable elements of any business cycle.

On the corporate side, a notable number of papers argue that insolvency volumes have a clear connection with the macroeconomic environment (see Liu and Wilson 2002; Bachmeier et al. 2004; Liu, 2004; and Zhou et al., 2010). However, the literature remains silent about the persistence of this relationship following the outbreak of major macroeconomic shock. This paper intends to contribute to the literature by filling this gap in assessing the depth of the relationship between macroeconomic environment and personal insolvencies in Canada.

Following Garrett and Wall (2014)'s observation that the largest contributor to rising bankruptcies during recessions has tended to be the longstanding upward trend, we depart from the literature in this paper by taking a whole new approach where insolvency filings are used as the only cause of high insolvencies. Hence the use of an Autoregressive Integrated Moving Average Model. The rationale is that, if it is true that insolvencies respond to labor market conditions, which tend to deteriorate during economic downturns, insolvent debtors feel less shameful and more justified about filing insolvencies when the economy fails. We assume that the causal effect between insolvencies and macroeconomic is indirect, which explains the contradicting results found in the literature about the relationship between insolvency filings and macroeconomic variables.

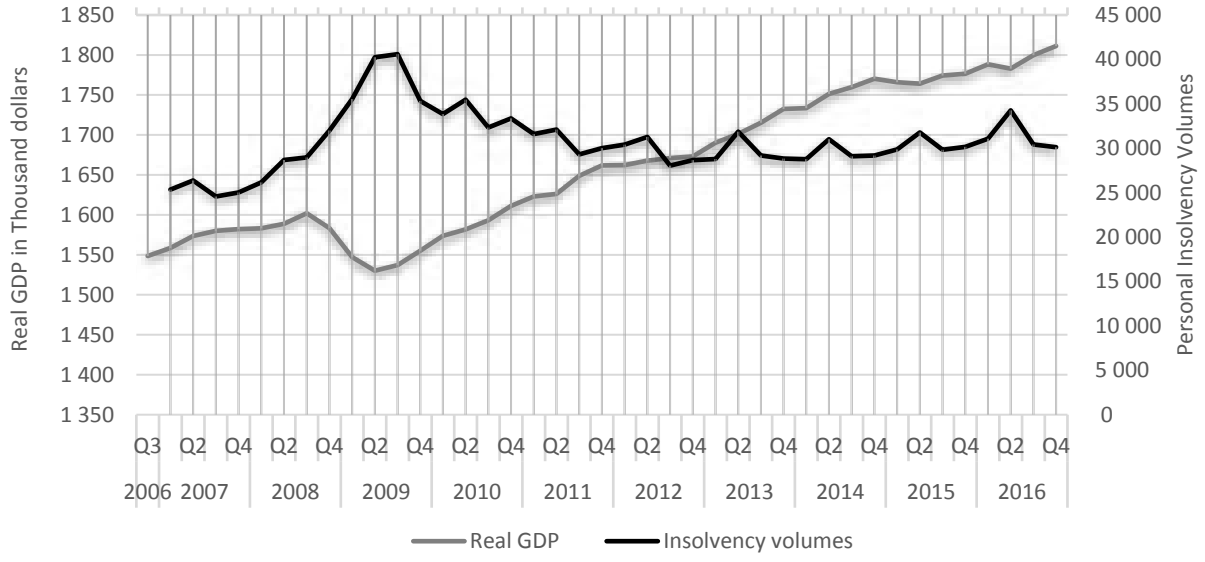
3. Trend in Macroeconomic Variables and Personal Insolvencies During the Last Recession

Before the economic downturn in 2008, quarterly personal insolvency filings in Canada were as low as 25 000 files during the third quarter of 2007 before it started to rise during the first quarter of 2008, at a time when the real GDP was still growing. As the real GDP began falling during the fourth quarter of 2008, personal insolvency filings significantly picked up to reach 40 589 files during the third quarter of 2009, the highest level of personal insolvencies ever filed in Canada in a single quarter, at the same time the economy was technically out of the recession (see Fig. 1).

Although the number of personal insolvency files starts declining during the first quarter of 2010, as the real GDP kept rising, unemployment rates remain relatively stable and employment rates improve (see Fig. 2), the pre-recession levels of new files have never been reached. The lowest number of personal insolvencies filed in Canada since the end of the recession was observed during the third quarter of 2012, still 14% higher than the pre-recession level and above trend. This situation makes our research question even more pertinent in the context of the countercyclical nature of insolvencies observed by some researchers, when the real GDP in Canada reached its pre-recession level since the third quarter of 2010.

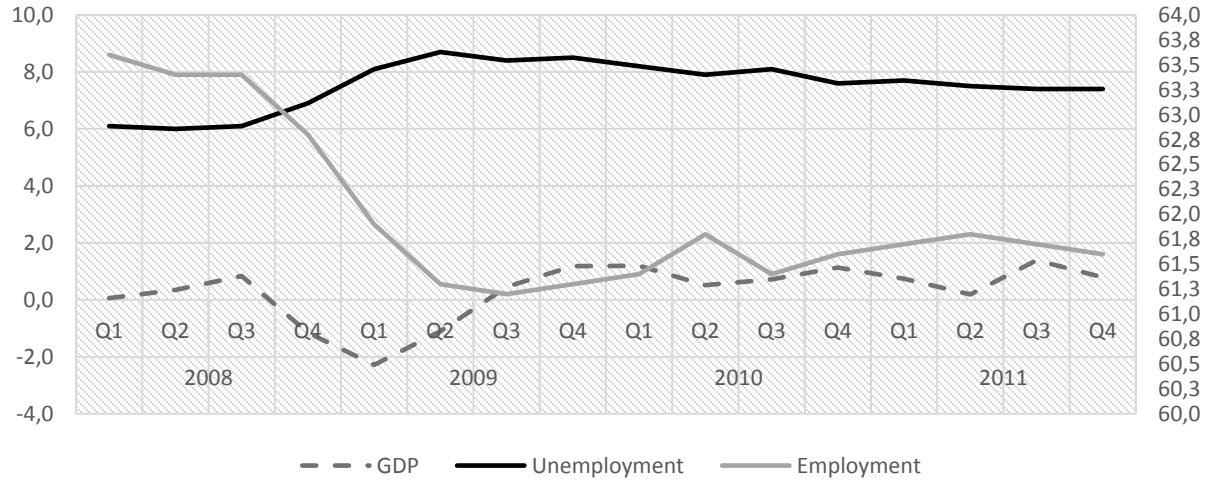
Finally, it is worth pointing out that, contrary to the general assumption that insolvency filings lag the recession, the outbreak of the 2008 recession lags the rise in insolvency filings in Canada by three quarters. Hence the approach used in this paper.

Figure 1 : Real GDP and Insolvency Volumes in Canada
From Q3-2006 To Q4-2016



Source: Statistics Canada (Real GDP) and the Office of the Superintendent of Bankruptcy (Personal Insolvency Volumes).

Figure 2 : Real GDP, Employment and Unemployment Growth Rates
Canada: Q1-2008 à Q4-2011

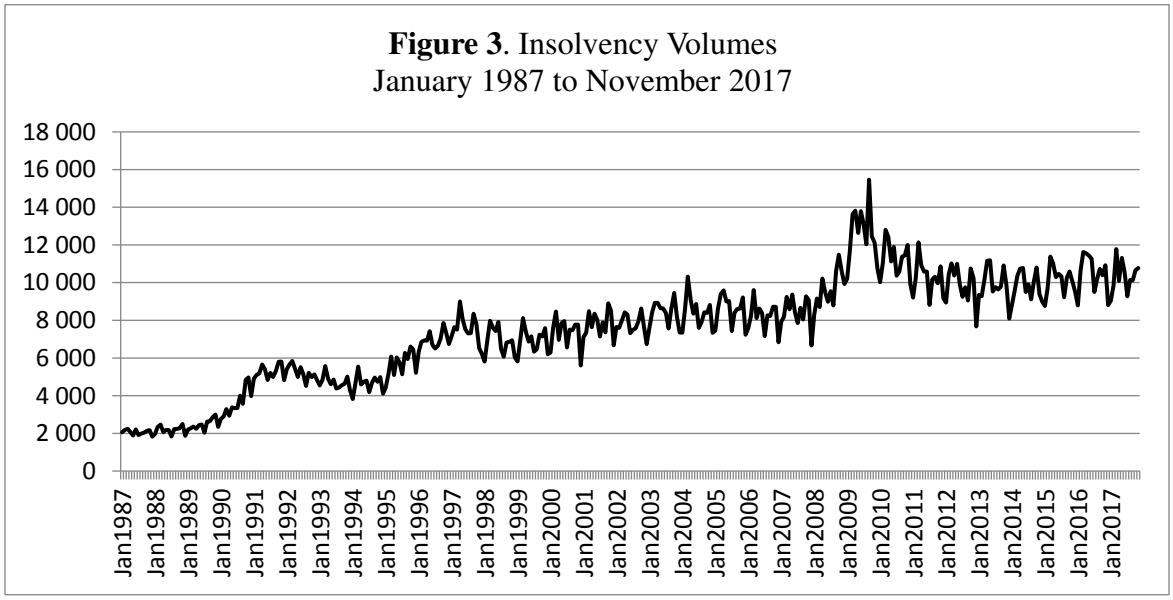


Source: Statistics Canada.

4. Data and Model

The data used in this paper to carry out our investigation consists of monthly personal insolvency volumes filed with the Office of the Superintendent of Bankruptcy (OSB) between January 1987 and November 2017. The OSB is the federal agency responsible for supervising the administration of insolvency files in Canada. As shown in figure 3 below, monthly personal insolvency volumes, which entail both bankruptcies and proposals filed by consumers, have consistently fluctuated over the time with an ascending trend. Between January 1987 and November 2017, the insolvency legislation was amended three times (1992, 1997 and 2009) with the most notable changes coming into force in September 2009. Far from significantly affecting the insolvency volumes, these changes rather lead to a shift in the consumers' insolvency choice with notable increase observed in consumer proposals while personal bankruptcies have declined.

Figure 3. Insolvency Volumes
January 1987 to November 2017



Source: Office of the Superintendent of Bankruptcy (OSB).

Finally, during the period covered by the data, Canada experienced two recessions. The first one lasted technically four quarters, going from the second quarter of 1990 to the second quarter of 1992. The second recession, which lasted three quarters, occurred between the fourth quarter of 2008 and the second quarter of 2009. Both were qualified, according to the classification of CD Howe Institute's Business Cycle Council[3], of category 4, that is, a recession that carries a substantial decline in both real GDP and employment, usually for a period of about a year or longer.

To understand the properties of the time series data, we run an Augment Dickey-Fuller (ADF), a Phillips-Perron (PP) and a Kwiatkowski-Phillips-Schmidt-Shin (KPSS) unit root tests on the monthly insolvency data. As shown in Appendix A, while the PP indicates that the time series process is stationary, both the ADF and the KPSS tests reveal the presence of unit roots. We then calculate the first difference of the series which is proved to be stationary by all the above-mentioned tests. Next, we proceed by plotting the autocorrelation function (ACF) and the partial autocorrelation function (PACF) of the differenced series to identify the number of AR terms that are needed, if any. An analysis of ACF and PACF plots, which can be found in Appendix B, indicates that neither of them dies quickly. Therefore, it is reasonable to conclude that no low order autoregressive (AR) or moving average (MA) will prove to be a good fit. As a result, using Akaike's Information Criterion (AIC), we test a variety of low order of ARMA(p, q) and compare the AIC values to determine the process that provides the least AIC.

The model to be estimated is specified as follows:

$$\Delta Y_t = \sum_{i=1}^{p} \beta_i \Delta Y_{t-i} + \sum_{i=1}^{q} \theta_i \varepsilon_{t-i} + \varepsilon_t$$

To estimate the parameters of a times series model, three rival methods are available: the Gaussian maximum likelihood (ML), the Whittle likelihood, which is an approximation to the likelihood function of a stationary Gaussian time series, and the Conditional Sum of Squares (CSS). While Shephard (1997) shows that the CSS ARIMA estimator can be converted into an ML ARIMA estimator, Robinson (2006) shows that both estimators are asymptotically normally distributed in case of long memory. Given the simplicity of the CSS estimator (see Chung, 1993) and considering that the CSS estimator is asymptotically equivalent to the ML estimator, we then use CSS method to estimate the parameters of this ARMA process.

5. Results and Final Observations

Table 1 below presents the results of an ARMA(14, 11) as discussed in the previous section. Both Box-Pierce and Box-Ljung autocorrelation tests confirm that the error terms are not correlated, which means the model does not exhibit any significant lack of fit and that the residuals of the ARMA(14, 11) process are white noise. As for the normality hypothesis of the distribution, Lilliefors (Kolmogorov-Smirnov) normality test confirms that the series follows a Laplace-Gauss normal distribution. These results not only reveal the existence of an ARIMA process in the insolvency volumes in Canada, but explain at the same time that the rise in insolvency volume is self-driven probably by a significant drop in insolvency stigma. As a result, since the insolvency

[3] See Turning Points: Business Cycles in Canada since 1926 by Cross and Bergevin (2012).

volumes follow and ARIMA(14, 1, 11) process, the estimation of the insolvency volume should take into consideration these factors.

Table 1. Results of the Regression

Coefficients	*Estimate*	*Std. Error*	*Coefficients*	*Estimate*	*Std. Error*
Intercept	22.3823	15.7332	AR13	0.1535	0.0743
AR1	-0.3439	0.2167	AR14	0.2233	0.0666
AR2	-0.5163	0.1971	MA1	-0.2681	0.2141
AR3	-0.3398	0.1928	MA2	0.4183	0.1203
AR4	-0.3440	0.1977	MA2	0.1971	0.1428
AR5	-0.2698	0.2081	MA4	0.1111	0.1610
AR6	-0.3135	0.1943	MA5	0.3053	0.1319
AR7	-0.4078	0.1893	MA6	0.0707	0.1439
AR8	-0.2675	0.2138	MA7	0.4328	0.0981
AR9	-0.2421	0.1968	MA8	0.0486	0.1421
AR10	-0.6014	0.1761	MA9	0.1531	0.1162
AR11	0.0450	0.2486	MA10	0.5153	0.1083
AR12	0.4083	0.1538	MA11	-0.4505	0.1878
Sigma^2 estimated as 206617: part log likelihood = -2759					
Box-Pierce Test: X-squared = 8.1212, df = 20, p-value = 0.9991 Box-Ljung Test: X-squared = 8.4424, df = 20, p-value = 0.9885 Lilliefors Normality test: D = 0.041094, p-value = 0.1393					
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05					

6. Conclusion

Despite insolvency volume in Canada started to decline after the 2008-2009 recession, it has remained significantly higher than the pre-recession levels. The objective of this paper was to determine the extent to which high insolvency volumes experienced in Canada at the outbreak of the 2008-2009 economic crisis are responsible for the high insolvency volumes observed more than eight years after the end of the recession, when the macroeconomic indicators are very strong. The econometric results show that insolvency filings in Canada follow an ARIMA process, and that current insolvency volumes can be explained only by past insolvency volumes and innovations for up to fourteen months. Since the 2008-2009 recession created an environment that lead to high number of insolvencies, it therefore does play a significant role in the persistence of the high number of insolvency filings observed in Canada. However, given that Canada was officially out of recession in June 2009, and that the AR part of the process is fourteen-month long, August 2010 must be considered as the last month to bear the weight of the 2008-2009 recession. In fact, any increase in insolvency volumes registered in Canada beyond August 2010, cannot be attributed to the 2008-2009 recession, but probably to other economic shocks that increased the budget constraint of Canadian households', such as the steep drop in the oil price and its consequences on the labour market. These results also explain the inconclusive state of the research on this matter which tries to explain the rise observed in insolvency volumes by micro or macroeconomic factors. They further explain the high insolvency volumes observed in Canada in the context of satisfactory economic fundamentals. As insolvencies rise, Canadian households feel more and more comfortable using this tool to discharge their debts and so on. Public policies that seek to address

the issue of high insolvency volumes in Canada should mainly focus on breaking this cycle. Future research that explains how the economic environment affect insolvency stigma should be more effective in explaining the rise observed in insolvency filings in Canada.

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Appendix A: Units Root Tests with 5 lags

Consumer Insolvencies in Level						
	ADF		PP		KPSS	
	ADF	p-value	Z_rho	p-value	stat	p-value
No drift no trend	1.094	0.926	0.13	0.720	1.73	0.0461
No drift with trend	-1.70	0.445	-8.19	0.274	1.85	0.01
With drift and trend	-2.16	0.509	-75.2	0.010	0.459	0.01
Consumer Insolvencies in First Difference						
No drift no trend	-11.1	0.01	-319	0.01	0.485	0.1
No drift with trend	-11.3	0.01	-319	0.01	0.0702	0.1
With drift and trend	-11.3	0.01	-318	0.01	0.0188	0.1

Appendix B: ACF and PACF Plots