

Purvis Prize
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Made In Canada
An Analysis of Canadian Monetary Policy between 1986-1999

by

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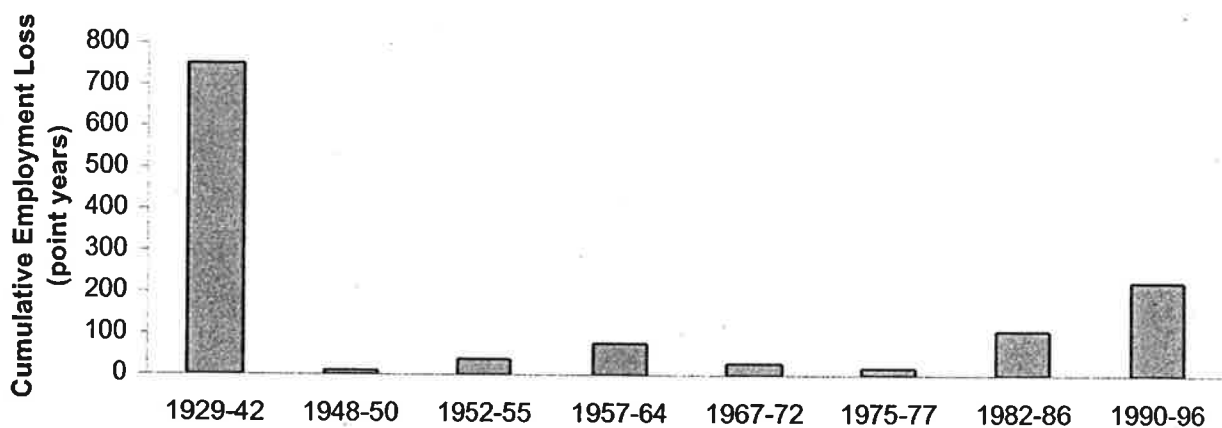
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Made in Canada.- An Analysis of Canadian Monetary Policy between 1986-1999

In February 1991, the Federal Government and the Bank of Canada jointly announced a series of targets for reducing inflation to the midpoint of a range of 1 to 3% by the end of 1995. At the same time, the Canadian economy was accumulating major employment and output losses that exceeded all other episodes of recession since the Great Depression (Fortin, 1993, p.761). The decline was second to none in the postwar period.

Figure 1: Size of cumulative employment loss during eight Canadian recessions



Source: Pierre Fortin. The Great Canadian Slump (1996). Table 1.

Note: Cumulative Employment Loss is the sum of the absolute differences between the actual employment ratio (% of working age population with jobs) and its pre-recession peak level, for all years in which the ration remains below the peak level.

The underperformance of the Canadian economy in the early 90's was the worst of any OECD member (Fortin, 1993, p. 762) and in stark contrast to the American experience of the time. Although the American economy struggled with a short-lived recession, it was mild (Taylor, 1998, p. 3) and the relative declines in unemployment and output were far less severe than in Canada.

Even though the ink on the NAFTA agreement was still wet, the Canadian and American economies were already two of the worlds most integrated. Why then did the American recovery not revitalize demand in Canada? Some authors, mainly Pierre Fortin point to relative monetary conditions as the answer. His argument is that Canada suffered an "old fashioned monetary contraction" (1993, p.492), a fate similar to the American Economy during the depression. This paper will address Fortin's claims, and will attempt to discover if the Bank of Canada in its attempt to remain credible to its inflation target lost sight of other economic goals like unemployment and growth. In comparison the United States, which did not set an explicit inflation target, successfully stabilized the price level and was spared from heavy employment and output losses that afflicted Canada. To address the discrepancy between the performance of the two economies I will construct policy reaction functions for both Canada and the U.S. over the period 1986 to 1999 and attempt to discover which indicators had the most influence on monetary policy. Additionally I will search for differences during the period in which John Crow - who was charged with implementing the inflation targets, was Governor at the Bank of Canada (1987-1995). Presumably if the need to remain credible to a target range of inflation was of paramount importance in Canada, the reaction function will attach a greater weight to fighting inflation compared to the American function. Additionally, it seems logical to assume that this effect will be even more pronounced during the period covering John Crow's administration.

The Bank of Canada chose to implement inflation targeting at a time when many other central banks were pursuing similar policies (New Zealand, Germany). The goal of inflation targets is to eliminate the uncertainty caused by changes in the price level,

especially in labour markets and the savings decision. Gordon Thiessan, former Governor at the Bank of Canada explains why the decision to target inflation was adopted rather than just a general commitment to gradually move towards price stability. After two decades of substantial inflation a general commitment was simply not enough to change expectations and behaviour sufficiently to bring down the inflation rate (Thiessan, 1996, p.15). In February 1991, the Federal Government and the Bank of Canada jointly announced a series of targets for reducing inflation to the midpoint of a range of 1 to 3 per cent by the end of 1995, then in 1993 this mandate was extended further to 1998 and remains the target today.

The Federal Reserve Act clearly defines the goals of monetary policy; “to promote effectively the goals of maximum employment, stable prices, and moderate long-term interest rates” (Federal Reserve Board, 2003, p1). Like the Bank of Canada, monetary policy is implemented by targeting short-term interest rates charged to banks and direct clearers – the Federal Funds Rate. Although the transmission mechanism on both sides of the border is essentially the same, and both have price stability as an objective, there is a major difference between the policies of the Fed and the Bank of Canada. The difference is that the Fed did not set an explicit inflation target. The reason that this difference is crucial is that it allows the Federal Reserve to pursue a broader mandate, with no inflation target the Fed can target other macroeconomic variables such as unemployment and not risk credibility. Alan Binder in a comment on the success of Greenspan’s policies notes that in Europe where the ECB has an inflation only mandate the economy often suffers because of the narrow focus of monetary policy (2002, p 46). Gordon Thiessan also addresses the topic of a narrow mandate, but disagrees with

Binder. Thiessan states that monetary policy has short-term effects on real variables but notes that the long-run inverse relationship between unemployment and inflation has been widely discredited. He also adds that an inflation target acts as an automatic stabilizer, and benefits investment, which in turn increases productivity (Thiessan, 1996, p 12). Therefore, the view of the Bank of Canada seems to be that because inflation is the only variable they can meaningfully control in the long-term, their policy objectives must focus on inflation. In comparison the United States has two options when short-term frictions between unemployment and inflation arise, such frictions are common during adverse supply shocks when there is downward pressure on employment and upward pressure on the price level. In this situation the Fed can choose between cushioning employment and output or slowing the growth of the price level, Canadian policymakers have forfeited this choice.

Pierre Fortin takes criticism of the Bank of Canada's policy change further by arguing that an inflation rate of zero is not beneficial, and that the employment costs of reducing inflation are not transitory or small.

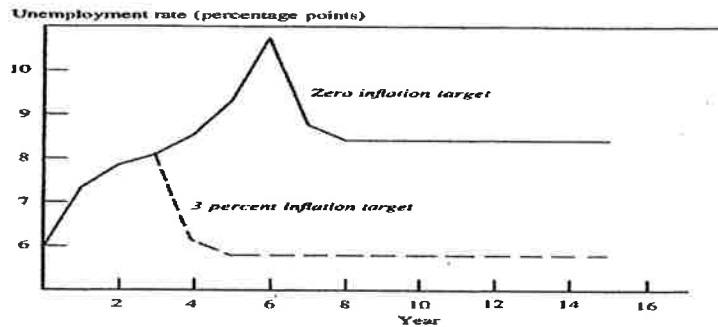
Fortin notes that since 1989 the Bank's sole objective has been to commit to holding inflation at a 'Zero level' which corresponds to a CPI inflation rate that is 'clearly below 2%' (Fortin, 1996, p.775). According to Fortin, the assertion that a rate of zero is superior to a low inflation rate is speculative, and that there is "a lack of hard quantitative evidence that there exists any significant benefits from zero inflation" (Fortin, 1996, p.776). He lists a number of reasons why policy makers choose the zero level. For instance, Kydland and Prescott (1977) have argued that central banks that lack a credible commitment to zero inflation must have an inflationary bias. As well there was

a consensus among European and Australasian central bankers that zero inflation was the appropriate choice. Finally he notes that the strongest reason is that the bank was attempting to establish itself as a tough central banker and as a result “responded to with a degree of tightness that even faithful supporters of its monetary strategy have found inappropriate” (Fortin, 1996, p. 777).

His second point of criticism is that monetary policy may have more than temporary effects on employment. According to his analysis inflation rates below 3% have the affect of permanently increasing the NAIRU, meaning that at inflation rates below 3 % the long-run Phillips Curve is negatively sloped, convex and eventually flat (Fortin, 1996, p. 779). The reason he explains for the non-linearity at low inflation levels is because relative wage adjustments become more difficult (for a more in depth analysis see Lawrence Summers (1991) and Tobin (1972)). To highlight this relationship he points out that it is the reason why the United States can average a 5% unemployment rate with 3% inflation, while Canada seemed incapable of lowering the unemployment rate below 9% even with the lower Canadian inflation rate.

In support of Fortin’s argument; Akerlof, Dickens and Perry estimated a model in which the increase in equilibrium unemployment rate associated with operating at zero inflation rather than 3% was 2.1% (1996, p 31). Additionally they use their model to show that the unemployment costs of reducing inflation are not-one time but are permanent and substantial. In support of this conclusion they advocate a low but positive rate of inflation and simulate two inflation targets, one in which a level of 3% is pursued and another in which the goal is zero inflation. The results are clear in this diagram from their paper:

Figure 2 – Akerlof, Dickens & Perry (1996) Policy Simulation.



Source: Akerlof, Dickens & Perry. *The Macroeconomics of Low Inflation* (1996). Brookings Papers on Economic Activity. The Brookings Institute.

Note: The initial inflation rate is 6%

The graphic clearly depicts that not only are the transitory effects of reducing inflation large but that they are much more persistent in the case where zero is the target. Consequently the sustainable amount of unemployment increases and reaches its long-run level approximately 8 years after the policy change.

In attempting to explain why Canada would choose to adopt a single objective strategy Fortin notes that it is due to the differences in structure between the Federal Reserve and The Bank of Canada. Unlike the Federal Reserve, which is decentralized with power spread among twelve districts and 7 Governors including a Chairman, the Bank of Canada has only one Governor. Given the diversity of the American framework it is less likely that 'speculative' policies would be implemented. Furthermore, Lawrence

Summers finds that central banks with greater independence tend to have lower inflation rates than those who are more politically influenced (1991, p 8). According to Fortin, Canadian policy makers claims that the benefits of zero inflation are large relative to moderately low levels, would be met by fierce academic criticism in the U.S., with critics citing the lack of domestic and international evidence. Interestingly, the Akerlof, Dickens and Perry paper was written in response to The Economic and Price Stability Act of 1995 introduced by U.S. Senator Connie Mack which outlined the need for a policy that targeted inflation at zero or very close to it (1996, p 68). Likewise a policy that is oblivious to unemployment would not likely be implemented in the United States (Fortin, 1996, 778) and the Humphrey-Hawkins bill mandates low unemployment (Summers, 1991, p8). Therefore to summarize Fortin's argument is to say that the change in Policy initiated by John Crow was flawed because it underestimated the employment costs of zero inflation. The narrow view taken by the Bank did not fully take into account the public's preferences between employment and inflation, as a result it choked off business investment and consumer durable spending as interest rates climbed to ensure the Bank of Canada remained credible as a tough inflation fighter.

As mentioned earlier the purpose of this paper is to test whether Canada in its attempt to stabilize the price level did so at the cost of greater unemployment and output loss. To test whether John Crow and the Bank were excessively hawkish inflation fighters I will employ a framework used by N. Gregory Mankiw; who used it to evaluate Alan Greenspan's on-going term as Chairman of the Federal Reserve. Mankiw's analysis provides a simple but intuitive overview of the economy, broken down by decade.

Mankiw first attempts to see if the Fed was successful in fighting inflation. He then proceeds to evaluate real variables in the economy and finally suggests that monetary policy implemented under Greenspan's administration is best described by a simple Taylor rule. In my analysis I have duplicated Mankiw's results for Canada and the United States although I only provide analysis for three decades (Mankiw covers five).

Additionally I have estimated Taylor rules for two sample periods, one which covers the period 1985 – 1999 and another which includes only John Crow's administration 1988 – 1994. Keeping with Mankiw's analysis, the regression is a simple one and is derived from an ordinary least-squares regression of the Federal Funds Rate (FFR) on a constant, the unemployment rate lagged one period, and core inflation (which is simply the CPI less food and energy) also lagged one period. For Canada I have replaced the dependant variable with the Overnight rate (which is the Bank of Canada's equivalent to the FFR) and repeated the same process. The Canadian data used is roughly equivalent to the American. Although there is some differences regarding the measurement of inflation (quarterly in the U.S. and annually in Canada) they are easily accounted for and should not affect the regression results. The second difference is much more dramatic, I have replaced the ONR with another measure of monetary policy, the Monetary Conditions Index (MCI).

The MCI is meant to provide a measure of the degree of ease or tightness in monetary conditions relative to a base period. The MCI captures the effect monetary policy has on the economy both through interest rates and the exchange rate. It is calculated as the change in the 90-day commercial paper rate since January 1987 plus one third of the percentage change in the exchange rate of the Canadian dollar against the

currencies of our major trading partners - the C6 exchange rate (Bank of Canada, 2004). The weights represent the relative effect that changes in short-term interest rates and the exchange rate have on output (Freedman, 1995, p. 3). Given that the Canadian economy is best described as a small open one and the tremendous importance of trade on domestic industry it only seems prudent to include this measure in the analysis. Additionally, adding the MCI as the dependant variable may capture some of Fortin's argument that the recession was caused by the divergence between Canadian and U.S. interest rates, undoubtedly if the spread was large as Fortin demonstrates there could be an exchange rate appreciation. Some author's note that the use of MCI is the appropriate choice as a dependant variable (Armour & Cote, 2000, p. 10). Also in support of the inclusion of MCI is work by Lawrence Ball who found that adding exchange rates to a Taylor rule improves its stabilization abilities although he includes this measure as an independent variable (Ball, 1999).

Admittedly, the interest rate formula presented by Mankiw and duplicated by myself in this paper is at first glance rather naïve. However there are many who suggest that simple formulas are more robust then complicated ones (Armour & Cote, 2000, p 9). Also of note is that this model is somewhat forward looking, Staiger, Stock and Watson (1999, p 38) have shown that unemployment may be among the most useful data for forecasting inflation. Despite the naivety this interest rate formula does a surprisingly good job of explaining central bank behaviour in both countries but may be more instructive in economies like the United States where inflation is domestically driven (Armour & Cote, 2000, p.11). Additionally, the use of a simple formula will clearly show

if greater weight was given to inflation versus employment, which is the question that is most central to this paper.

As mentioned earlier the central bankers top priority is to keep inflation in check. According to most theories of monetary policy, central bank actions have only a transitory effect on real variables. However, the effects of monetary policy on inflation continue in the long-run; in fact the Bank of Canada expects to influence inflation six to eight quarters in the future (Thiessan, 1996, p.10). Given these conclusions inflation seems like a logical place to start looking at the data. In the words of former Bank of Canada Governor Gordon Thiessan: “ price stability, is the contribution to the effective operation of the economy that monetary policy is capable of delivering (1996, p.18).

Table 1			
Inflation	1970's	1980's	1990's
<i>Canada</i>			
Average	7.37	6.51	2.20
Standard Deviation	2.89	3.18	1.67
<i>United States</i>			
Average	7.09	5.66	3.00
Standard Deviation	2.72	3.53	1.12

Source: Mankiw. Cansim I Database: series label P100285.

Table 1 shows the inflation experience in Canada and the US over the last three decades and lists the average level as well as standard deviation, which is a common measure of volatility.

A look at the average rates shows that comparably the 1990's were a low inflation decade in both Canada and the United States. According to Mankiw the decline in

inflation in the US was the result of tough deflationary policies instituted by Paul Volcker in the early 1980's as well as an aggressive interest rate response to a rise in inflation (2002, p. 21). He goes further in stating that as inflation fell from a peak of just over 14% in march 1980 to 3.6% three years later there was a temporary decline in production and a rise in unemployment that resulted in the largest recession in the U.S since the Great Depression (2002, p.22). The American experience in the early 1980's seems to foreshadow a similar situation ten years later In Canada, and makes it clear that the Canadian deflation is not a unique or isolated economic incident.

A look at the standard deviations shows that in both countries the price level was drastically more stable in the 90's then over the previous two decades. In the United States inflation was 2/3 less volatile in the 90's compared to the 80's. In Canada a similar picture emerges, inflation was half as volatile in the 90's. Undoubtedly these measures show that Central Bankers successfully stabilized the inflation rate, but they beg the question of what is more important; the level of inflation or its stability? Quantitatively this is a difficult question to answer but the solution would give tremendous insight into Canada's experience. If moving to very low levels of long-run inflation causes larger increases in unemployment it could explain the differences between Canada and the US over this period . However, if price stability is the goal of monetary policy it clearly was a successful decade.

Table 2
The Real Economy

<i>Real GDP growth:</i>	1970's	1980's	1990's
<u>Canada</u>			
Average	4.15	3.05	2.44
Standard Deviation	1.72	2.64	2.39

<u>United States</u>			
Average	3.28	3.02	3.03
Standard Deviation	2.80	2.68	1.56

Unemployment:

<u>Canada</u>			
Average	7.66	9.44	9.41
Standard Deviation	0.52	1.73	1.46

<u>United States</u>			
Average	6.22	7.27	5.76
Standard Deviation	1.16	1.48	1.05

Source: Mankiw. Cansim 1 Database: series labels: D100126, D980745.

Although monetary policy is most effective in controlling long-run levels of inflation and economic theory maintains that its real effects are transitory, it does influence real indicators in the short-run. In economic terms, monetary policy is neutral in the long run, but not in the short-run (Mankiw, 2002, p.26). Therefore, there is a limited role for monetary policy in influencing real factors such as unemployment and inflation.

Table 2 displays average rates of unemployment, real GDP growth, and their standard deviations for the period 1970-1990. Unlike the inflation situation described previously there are major differences north and south of the border.

At first glance it seems obvious that Canada trails the U.S. in terms of real economic growth, as well as employment. Although it is commonly accepted that the natural rate of unemployment is generally higher in Canada compared to the U.S., the unemployment trend is far different between the two nations, the U.S. reduced unemployment. In comparison Canada's average unemployment remained virtually unchanged from the 80's. Because of the imprecision in measuring unemployment and the differences in social programs it may be more useful to compare volatility. Although unemployment volatility decreased from the 80's to 90's in both countries the decline

was far larger in the U.S. Additionally, Mankiw notes that the volatility in unemployment during the 90's was the lowest in any of his data, which is more extensive and includes the 1950's and 60's (pg 26). In Canada the 70's appear to be the most stable decade in regards to unemployment.

The declines in the rate of real GDP growth are rather steep, in the 1970's Canada was experiencing strong growth in the area of 4%, however at the end of the 1990's growth was a respectable but far weaker 2%. What distinguishes this decline is that although real GDP growth fell in the US, the decline was far more pronounced in Canada. Additionally growth in Canada has become more variable compared to the U.S and has nearly doubled its amount of volatility since the 1970's.

Some caution should be taken when observing the data for Real GDP, as well as unemployment. In terms of unemployment; labour market conditions and social programs play key roles and are not included in this analysis. Also of note is that the long-run level of economic growth is not influenced by monetary policy, it is a function of technological progress. Another consideration is that the average Canadian growth for the 1990's is somewhat misleading because growth stagnated in the first half of the decade and improved in the last half. In fact for the years 1990-95 the average growth of GDP was 1.5%, in comparison growth in the second half was almost 4% (3.9%). If monetary policy has short-term implications the declines in the first half of the nineties may be an indicator of John Crow's responsibility in the economic downturn.

In conclusion Mankiw's test as applied to Canada does seem to initially indicate that price stability in Canada was costly, or to say the least did little to improve the real economy. Canada's experience is a stark contrast to the United State's where over a

similar period the Fed successfully controlled inflation without sacrificing the performance of the real economy. In fact, there is a wide range of literature in praise of Allan Greenspan for achieving such an accomplishment (see: Mankiw (2002), Taylor(1998)).

Could it be that the better performance of monetary policy in the U.S. was due in part to the broader policy objectives pursued by the Federal Reserve ? The coefficients of the Taylor rules discussed earlier should make it clear where the emphasis of monetary policy was concentrated. The results with either the ONR or FFR as the dependant variable are presented below:

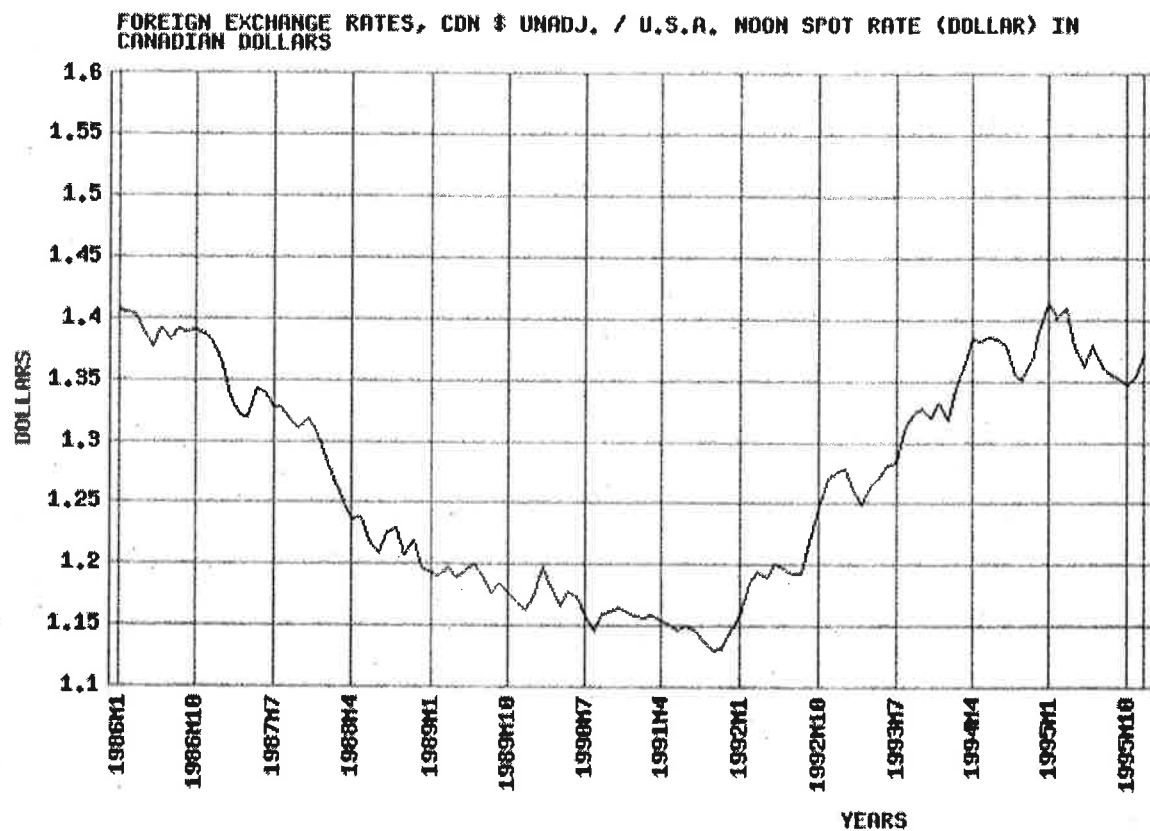
	Canada (ONR)		United States(FFR)
	1986-1999 160 obs	1988-1994 84 obs	1986-1999 160 obs
<i>Unemployment</i>	-.402 (.122)	-1.298 (.140)	-.745 (.079)
<i>Inflation</i>	1.132 (.078)	.546 (.101)	1.499 (.080)
<i>Adjusted R2</i>	.61	.78	.67

Source: Cansim 1 Database series labels: D980745, P100285, B14044.
DRI Database series labels: PZUXX, FYFF, LHMUR

The appropriate interpretation of the above coefficients is that on average when central bankers were faced with either a 1 percent change in inflation or unemployment the interest rate will rise or fall by the amount of the coefficient. All coefficients presented above are statistically significant, but do not necessarily tell the whole story. For instance the Bank of Canada's response to inflation during the sub-period is less than one. It is generally accepted that when increasing the nominal interest rate to cool

inflationary pressure the response should be greater than one; without an aggressive response the real-interest rate will not increase and the policy will actually feed the inflationary pressure. Clearly the Bank of Canada understands this principle and the reason for low coefficient is actually related to movements in the exchange rate – which was steadily appreciating over this time (see graph below). Given the appreciation of the exchange rate the Bank would not have to respond as aggressively as the American's because a rising Canadian Dollar could serve to keep inflation in check.

Canadian Dollar 1986-1995



Source: Cansim 1 Database; Series label B3400

Note: This is the direct exchange rate, therefore appreciations are downward movements and depreciations are upward.

However the regression results show that the Bank of Canada was not neglecting real economic variables under the sub-period when John Crow was Governor. According

to this analysis Governor Crow was very mindful of employment. Although over the entire sample period the response to unemployment was less than the American it still did garner a policy response. This result is somewhat puzzling given the recession that dominated the early nineties, it also runs contrary to Fortin's argument that the Bank's attempts to remain credible came at the expense of the Canadian economy. Given these results it seems that including the MCI as the dependant variable may yield different results because it will allow for an indirect test of Fortin's claims, it will also do a better job of isolating the effects of the exchange rate. The results with the MCI substituted for the ONR are listed below, also included are the U.S. results where a MCI is not used but is there to allow for comparison.

	Canada		United States
	1986-1999 160 obs	1988-1994 84 obs	1986-1999 160 obs
<i>Unemployment</i>	.287* (.208)	-1.187 (.201)	-.745 (.079)
<i>Inflation</i>	2.311 (.133)	1.48 (.146)	1.499 (.080)
<i>Adjusted R2</i>	.649	.81	.67

Source: Cansim I Database series labels: D980745, P100285. Bank of Canada.
DRI Database series labels: PZUXX, FYFF, LHMUR

* Coefficient is not statistically significant.

When the MCI is substituted as the dependant variable Fortin's argument gathers strength. Over the entire period the coefficient for the unemployment rate is not significant. Additionally the response to inflation significantly increases relative to when the ONR is used to measure policy reaction. This result clearly shows that the Bank was aggressively targeting inflation and was not basing policy on employment concerns. To

see just how aggressively the Bank was fighting inflation compare Canada's response to the American, it is nearly an entire percentage point higher. Obviously Canadian central bankers took their commitment to the inflation target quite seriously.

However, in the sub-period (1988-1994) the Bank's response to inflation decreases to one that is almost identical to the American response as well it seems that employment also becomes a significant objective for policy makers. Furthermore, the regression for this period explains over 80% of the behaviour observed. This is a powerful result considering Fortin's allegations and the actual Canadian experience at the time.

According to this analysis John Crow's administration was no more aggressive in targeting inflation than their counter-parts at the Federal Reserve, and contrary to a number of critics increases in unemployment did result in a loosening of monetary policy.

Therefore to summarize the findings of the Mankiw's policy analysis framework it can be said that although a look at the summary statistics (averages and standard deviations) shows that the Fed both simultaneously stabilized inflation and real variables, Canada was less successful. The Regression analysis shows that there was of a deflationary bias at the Bank versus the Federal Reserve, this is true using either dependant variables over the entire sample period, however the sample period in which John Crow was governor does not exhibit the same results.

Although the regression results seem to carry a mixed message, there is no denying the underperformance of the Canadian Economy during the early 1990's. The recession existed during a time in which the American economy was booming and it mirrored a similar American downturn ten years earlier. The American recession is widely viewed

as a result of deflationary policy at the Fed as they tried to stabilize an economy plagued by the OPEC crisis and subsequent stagflation. The Canadian experience ten years later is still often referred to as the "Crow Deflation" and seems to be a repeat of the American recession in the 80's. It also seems intuitive that the losses which were accumulated were most likely the result of similar deflationary policies, however the lynch pin of this argument is whether a decline in inflation actually causes employment losses as it is assumed to do under the Phillips curve. The verdict is still out on the existence of the Phillips curve and we are far from actually knowing its shape across a number of equilibriums. Put more simply, there is still very little known about the relationship between inflation and output.

Akerlof, Dickens and Perry present powerful evidence against the policy chosen by Canadian policy makers and the story told in their model does much to describe the length and depth of the Canadian recession. However their findings are based on a model, moreover that model is based on the American economy. For instance there are a number of assumptions required to replicate their results including; monopolistic competition, very few or zero negative wage changes (downward wage rigidity), and heterogeneity in wages. The Akerlof et al. paper is one of the foundations of Pierre Fortin's claims and their assumptions have come under fire from other academics. Perhaps the strongest critics of Fortin's approach are Tiff Macklem and Charles Freeman who argue that the assumption of few negative wage changes is false. They also use a reduced form model of the Canadian economy to conclude that Fortin's claims that one economic variable (Monetary Policy) is not suitable to describe the experience of the Canadian economy. Instead they claim the downturn was the result of a culmination of variables including:

supply side factors, the looming Quebec referendum, government debt and subsequent financial re-entrenchment (1998, pp 646-650). In light of their arguments a claim that monetary policy was the sole cause of a major recession does seem exceptionally critical, but similar claims have been made about the Great Depression.

My analysis seems to contribute to both sides of the debate, when using the ONR I found that policy makers responded to both changes in inflation and unemployment, however the results may be distorted by a major appreciation of the Canadian dollar. The more robust results where the MCI is the policy tool revealed that the Bank was pursuing a single-minded strategy and responded to inflation with a heavy inflationary bias which clearly gives weight to Fortin.

Monetary policy is a powerful tool and it evolves over time as economic thinking and econometric analysis improves. In recent years there has been a number of changes from a focus on monetary aggregates to interest rate targets and finally inflation control, each evolution is a result of new findings, theories and an advancement of the field. Whether the inflation control targets imposed in the early 1990's were misguided remains a matter of debate. A relationship does appear to exist between the model presented by Akerlof et al., Fortin's claims of a monetary contraction and the chronic unemployment of the Canadian model. I remain convinced that the recession of the 1990's was the result of monetary policy, unfortunately my analysis resulted in a mixed conclusion. The American experience of the early 1980's provides a powerful historical example regarding the relationship between deflation and output, as does the Great Depression. It is my hope that as the relationship between output and inflation is better understood, that policy will evolve to accommodate it.

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