Is the Bank of Canada any more or less independent than the Fed?

by

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Abstract

In this paper I apply the work of Abrams and Iossifov (2006) to monetary policy in Canada to see if same political party affiliation is needed to produce evidence of political opportunism. After modifying their analysis to maintain consistency in the time series dimensions of their variables for Canada, I find both an error correction model and a Taylor rule reformulation of their test generate evidence consistent with same party political opportunism, but only weakly so. On the other hand, I find also that more traditional indicators of political influence present even more convincing evidence of political dependence. In particular, the data suggest that the election of a Liberal party government, a decrease in the degree of political competition, and to a lesser extent, the election of a minority government all positively influence the expansiveness of Canadian monetary policy. In combination, these findings are consistent with the hypothesis that the Bank of Canada is less rather than more independent than is the Fed.

Keywords: Central Bank Independence, monetary policy, opportunism, Taylor Rule, error correction model, political competition.

JEL Subject codes: E52, E58.

I. Introduction:

In a recent paper "Does the Fed contribute to a Political Business Cycle?", Abrams and Iossifov (2006) argue that the possibility of a political cycle in U.S. monetary data has been rejected too quickly. This, they argue, is because earlier tests do not control explicitly for a coordination link needed to effectively implement any strategic political plan. For an opportunistic political strategy to become successful, they argue, policy instruments must be manipulated sympathetically and this requires the active cooperation of party strategists with program administrators within the bureau. In the case of U.S. monetary policy, Abrams and Iossifov argue that opportunism becomes feasible only when the Chairman of the Board of Governors and the President are from the same political party. When they allow the data to distinguish elections by periods of same party affiliation, previous ambiguities disappear and political opportunism becomes apparent in the data.

In this paper, I ask whether tests for political opportunism in Canadian monetary policy exhibit the same type of ambiguity and whether same party affiliation is needed to reveal its presence in the data. I then proceed to ask whether there is evidence of any of the more general ways in which politics could have influenced the conduct of monetary policy in Canada.

On *a priori* grounds there are strong reasons for believing that opportunism should be more prevalent in monetary policy in Canada than in the U.S. In part this is because Canada is a parliamentary democracy and the governing political party in such systems normally have the right to call the next election and can be expected to do so for strategic effect. In addition, the Coyne Affair of 1961 firmly established political control over monetary policy in Canada.[2] In that historical episode, the inability to reconcile inconsistent monetary and fiscal policies led the then Prime Minister, John Diefenbaker, to fire the Governor of the Bank of Canada, James

Coyne. The initial refusal of the Governor to leave office then precipitated a constitutional crisis that resulted ultimately in the resignation of the Governor and the adoption of legislation enshrining the leadership of the Minister of Finance in matters of economy policy. Nevertheless, despite the undisputed ability of the Prime Minister through his Minister of Finance to dictate Bank policy by "writing a letter of direction" to the Governor,[3] Canada's Central Bank and its Governor appear to enjoy a considerable degree of independence from partisan politics and the specific policy platform of the governing party.[4] Hence whether in practice partisan political considerations have influenced monetary policy in the same opportunistic way as they appear to have in the U.S. is still an open question, a question of considerable political and economic interest.

I begin the search for political cycles in monetary policy by looking first for evidence of a correlation between monetary outcomes (inflation rates) and the timing and partisan nature of Canadian elections. Finding that these correlations are sufficiently strong to merit further search for specific political influence on monetary policy itself, I replicate Abrams and Iossifov's test for political opportunism on Canada. I then point to a number of time series issues with the form of their test when applied to Canadian data and use the time series considerations to reformulate their test in two ways. The first restates their concerns in terms of an error correction model while the second reformulates their use of a Taylor rule by specifying more precisely what is meant by the policy variable and the measure of the output gap. However, once these tests have been reformulated to allow trending economic variables to be combined with stationary election variables, other explicitly political variables (such as the degree of political competition, the partisan nature of the governing party and the minority-majority status within a parliamentary

democracy) can be introduced into the analysis. The results of all these amendments suggest that monetary policy is consistent with the hypothesis of opportunism in Bank of Canada behavior but only marginally so. And to reach this conclusion, the test for opportunism requires its restriction to the same party affiliation considerations highlighted by Abrams and Iossifov. Perhaps even more importantly, however, the data suggest that other political factors play at least as strong a role in monetary policy as opportunism. In particular, the degree of political competition in the election, the ideology of the party in power, and, to some extent, minority party status (independent of partisan type) stand out as factors that are associated consistently with an easing of monetary policy.

II. A Canadian Political Monetary Cycle?

To motivate my inquiry into political influence and monetary policy, I begin by presenting in Table 1 a test for the presence of a political cycle in the inflation data for Canada over the period of the Bank of Canada's existence – 1935 - 2006. In that table, the columns represent the results of regressing the Canadian inflation rate against U.S. growth and inflation rates, lagged inflation, and two alternate sets of political variables.[5] The U.S. variables are introduced to control for common economic and nonpolitical influences that might impact on Canadian inflation rates. These are good instruments because of the considerable degree of economic integration between the two economies and the fact that Canadian political events can be expected not to cause U.S. macro outcomes. In addition, I include a lagged inflation rate term as a right hand side variable to control for the serial correlation that tends to arise in aggregate macro data.

Given these controls for economic influence, I introduce two sets of political variables. The first uses an election year dummy variable, taking the value of 1 in each federal election year (zero otherwise), ELYEAR. The use of this and its led value, ELYEAR + ELYEAR(1), tests for whether the incumbent political party was successful in expanding macro aggregates in the period immediately prior to an election to increase its probability of re-election (Norhaus, 1975). The second set of political variables test for the partisan distinctiveness of electoral outcomes. Here traditional partisanship (Hibbs, 1977) suggests that the election of the party of the left, the Liberal Party in Canada (LIBERAL = 1 for years of liberal party government, 0 otherwise) will be expansionary, raising inflation, while its more conservative rival will be contractionary, reducing inflation. More recently, the myopic aspect of traditional opportunism and partisanship have been criticized and changed to incorporate the hypothesis that private agents are likely to have forward looking expectations. Hence rational partisanship requires an element of surprise for partisanship to be able to influence inflation and output (Alesina, Rubini, with Cohen, 1997). Hence larger liberal victories are assumed to be more anticipated by the public and thus expected to have a smaller effect on real output while smaller sized Conservative party victories are expected to have more powerful contractionary effects than larger victories. Here surprise is partisan in terms of its directional effect and is assumed to vary inversely with the size of the winning majority in percentage of seats won (and measured as 1- SEATS). Finally, note that because we are interested in cycles in inflation rather than output, the second test for rational partisanship--the diminution of the effect produced by surprise through time--will not be applicable. This is because discovery will reverse the expansionary effect on output, but only strengthen the effect on prices.

To test these hypotheses, the columns of Table 1 distinguish three different versions of this test. In column (1) surprise is measured by assigning the same sized coefficient but with opposite sign to Liberal versus more conservative party victories. In column (2), only Liberal party outcomes are used in the measure of surprise (hence allowing the different partisan types to have a different quantitative effect on inflation). In column (3), the element of surprise is dropped from the test so that column (3) is a test of traditional partisanship. Finally, I will later argue that a shorter time period 1954-2006 may be more relevant for any test of monetary policy. Hence for later comparison, column (4) repeats the test of rational partisanship in column (1) for the shorter time period. As can be seen by inspecting Table 1, however, the four versions of the test present estimation results that are broadly similar.

insert Table 1 around here

The most striking feature of Table 1 is that despite the importance of variables controlling for non-political or economic influences on inflation, the data is not inconsistent with either political opportunism or rational partisanship. The coefficients on SURPRISE testing rational partisanship are positive for both time periods (columns (1) and (4)) and significantly so for both at five percent. Similarly, when the test distinguishes only Liberal Party victories, in column (2), the coefficient estimate on LIBERAL SURPRISE is found to be somewhat larger (as would be expected) and again significantly different from zero (at the one percent significance level). Finally, even when the element of surprise is dropped completely so that only partisan type distinguishes the election outcome, liberal party victories are found to be associated with significantly higher inflation rates. Hence while the data may have difficulty distinguishing

between the traditional and rational forms of partisanship, this should not detract from finding relatively strong evidence for some form of partisanship in the data.

The evidence for the hypothesis of political opportunism is only slightly less convincing. In all cases, the years leading into a federal election (ELYEAR + ELYEAR(1)) are associated with higher inflation rates, as predicted, but significantly so only if one extends the confidence interval to ten percent. In column (1), the equation that presents the most convincing evidence of (rational) partisanship, the coefficient on ELYEAR + ELYEAR(1) is positive and significantly different from zero at just less than six percent.

I conclude that the time series variations in inflation rates makes plausible the hypothesis that opportunistic and/or partisan political actions may have played some role in producing a monetary cycle in Canada. This then motives an investigation of the conjecture that monetary policy is the transmission mechanism for producing this effect. To the degree that evidence consistent with political influence on the exercise of monetary policy can be found, the case for a political business cycle is strengthened. It also provides evidence on the degree of independence in Bank of Canada behavior.

III. Evidence of Opportunism in Monetary Policy Data

In this section I follow Abrams and Iossifov (2006) and represent Canadian monetary policy through the estimation of a Taylor rule on Canadian annual data over the 1935 to 2006 time period. To do so, the Bank of Canada is viewed as setting its policy instrument--the bank rate--in relation to the size of the output gap and the deviation of the inflation rate from a targeted rate, with the lagged interest rate included in the equation to reflect a concern with

interest rate smoothing. In relation to this equation, evidence of political opportunism would be indicated by an otherwise unexplained lowering of the interest rate in the time period leading into an election. Given the well-known existence of lags in the monetary transmission process, opportunism in monetary policy would mean that these signed deviations in the interest rate should appear up to two years prior to each federal election.[6]

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insert Table 2

In column (1) of Table 2, the traditional test for political opportunism under a Taylor rule (with interest rate smoothing) is estimated on annual data for Canada over the 1936 to 2006 time period. In doing this I have assumed that changes in the output and inflation gap mimic changes in actual output and inflation, and that opportunism would lower the bank rate more than usual in the two years leading into each federal election. The results indicate first that the hypothesis that the Bank of Canada operated as if it followed a Taylor rule (with smoothing) is consistent with the data, explaining roughly eighty eight per cent of the variation in the bank rate.[7] Hence the data is broadly consistent with the Bank of Canada raising the bank rate when real output increases and when the rate of inflation rate rises relative to a constant targeted rate, controlling for the strong degree of persistence that exists in the bank rate. On the other hand, the traditional test for political opportunism, the coefficient estimate on ELYEAR(1)+ELYEAR(2) in column (1), finds virtually no evidence of its presence. In this sense the Canadian results mimic Abrams and Iossifov finding that traditional evidence for political opportunism is ambiguous at best.[8] In our case, the negative coefficient associated with the dummy variable ELYEAR(1) + ELYEAR(2) does have the predicted sign for opportunism but is itself insignificantly different

from zero.

I next test for Abrams and Iossifov's contention that the inability to find opportunism is because the traditional test does not account for the same partisan affiliation needed to coordinate and enforce opportunistic policy actions. To do so, I define the new dummy variable SP_Dummy as taking the value 1 in election years in which the political party that appointed the current Governor and the incumbent governing party are the same (zero otherwise).[9] Column (2) in Table 2 then presents the results after SP_Dummy(1) + SP_Dummy (2) is substituted for ELYEAR(1) + ELYEAR(2) in the previously estimated equation. Here the findings continue to show Abrams and Iossifov type results in that the coefficient on same party affiliation is both larger and more significant than its less discriminatory election year counterpart. On the other hand, the coefficient estimate while becoming significantly different from zero at 13 percent, still falls short of even the least restrictive of the conventional levels of significance.

In columns (3) and (4) I re-estimate the monetary policy regression in (2) first over a shorter sub-period and, second, with a break corresponding to the adoption of Inflation Targeting in Canada in 1991. The reason for using the shorter time period is that it is often argued that the Bank of Canada did not use the bank rate in its early years as an active instrument of monetary policy, keeping the bank rate both artificially low and artificially constant until after Canada abandoned Breton Woods and adopted flexible exchange rates in the mid 1950's.[10] Re-estimation of the monetary policy equation over this shorter 1954-2006 time period in column (3) does indicate that despite the loss in power associated with the reduced number of observations, the coefficient estimates and levels of significance for most variables are broadly similar to those found in (4).[11] However, in terms of the test for opportunism, both the

coefficient estimate and its level of significance are higher than for the coefficient estimated for the entire time period of the Bank's existence. Most importantly, same party affiliation now becomes significant as a determinant of the bank rate. Same party affiliation lowers the bank rate in the periods leading into federal elections consistent with the prediction of political opportunism.[12]

Finally, control for a possible regime switch following the adoption of Inflation Targeting in 1991 does not change the general nature of the findings in equations (2) and (3). The results in column (4) suggest that the period of inflation targeting in Canada was distinct and associated with a significantly lower (nominal) bank rate (presumably reflecting the value of tying down expected rates of inflation). Yet the strong effect overall arising from inflation targeting appears to have taken something away from the partisan coordination hypothesis, raising the standard error of the SP_Dummy(1) + SP_Dummy(2) coefficient. With a break in the structure of monetary policy corresponding to the period of inflation targeting, the significance of the same party opportunism once again slips below the minimum standard needed for significance. From the perspective of this set of tests, then, the presence of a same party coordinating effect along the lines of Abrams and Iossifov is suggested but cannot be confirmed by the data.

IV. A Cointegration and Error Correction approach to Monetary Policy

In Table 3 the descriptive statistics of the Canadian variables used in the Abrams and Iossifov test and political variables that will be used later are presented. What is immediately apparent is that in terms of their time series properties, almost all of the economic variables

appearing in Table 2 are nonstationary or I(1).[13] Hence it is possible that because all these variables have drifted upwards through time, the relationship estimated in Table 2 may be spurious. On the other hand, if monetary policy did succeed in imposing structure leading to a long run equilibrium relationship among these variables, then the group of primary variables in the equations should show evidence of cointegration. Under these circumstances, the linear relationship estimated among these variables would be a cointegrating vector and provide strong evidence for the existence of an evolving long run equilibrium relationship among the variables.

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insert Table 3

In column (1) of Table 4, the OLS equation that corresponds to the long run economic relationship implied by the Taylor Rule in column (1) of Table 2 is estimated.[14] As the results make apparent, it is the dropping of the lagged dependent variable from the equation that makes the appearance of cointegration in Table 2 column (1) disappear – i.e., the size and significance of the ADF statistic falls dramatically between Table 2 column (1) and Table 4 column (1). This implies that the earlier relationship estimated as the traditional test for opportunism under the Taylor Rule gave the appearance of cointegration (through the absolute size of the ADF statistic on the residual) only because of the power and significance of the lagged dependent variable (the interest smoothing term) that is not part of the long run equilibrium relationship. Moreover, the addition of political variables throughout Table 2 adds to the estimating equation a series of stationary variables – ELYEAR(1) + ELYEAR(2), SP_DUMMY(1) + SP_DUMMY(2) – resulting an estimating equation that now combines trending I(1) economic variables with stationary I(0) political variables, a mixture whose interpretation becomes problematic. Together

these findings suggest either that the tests in Section III for opportunism should be modified or that another approach to incorporating political variables be adopted.

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insert Table 4 here

In the remainder of this section I take the latter route. Rather than restructure the Abrams and Iossifov I(1) variables to derive a I(0) test for the presence and significance of Canadian political data, I first look for evidence of a long run equilibrium relationship among the economic variables. Then once a cointegrating relationship is found to represent the long run, the error correction model of short run adjustment about this long run relationship can be used to test whether there is evidence of (0) political factors influencing the I(0) policy adjustment process.

One reason for why the variables in column (1) may not show evidence of cointegration is that there may exist a structural break in an otherwise significant equilibrium relationship. Our earlier work suggested one likely possibility arose with the introduction of inflation targeting in 1991. However, when the equation in column (1) was re-estimated first before and then after 1991, the equation residuals still generated ADF statics that were inconsistent with cointegration. For this reason I added the logarithm of the unemployment rate, LNURATE, to the set of economic variables assumed to affect and be affected by the rate of interest. Here LNURATE suggests itself as a plausible variable for inclusion because it has a long run stochastic trend (i.e., is I(1)), exhibits variation over the business cycle (so that its presence may form part of the short run error correction process), and because it is related in a predictable way to the other variables through theory. In terms of the latter, theory suggests that to the extent a rise in the long run rate of unemployment reflects a permanent fall in potential output, the real rate of interest would be

expected to be higher (i.e., reflects a movement around an otherwise fixed IS curve).

In column (2) of Table 4, then, LNURATE is introduced into the estimating equation and while its addition was insufficient by itself to induce evidence of cointegration, the addition of both it and a structural break corresponding to the period of Inflation Targeting did generate evidence of cointegration.[15] The equation reproduced as column (2) is then taken as our cointegrating vector providing evidence consistent with a long run equilibrium relationship arising among these trending economic variables over our time period.[16] As a test of its robustness, I reran the equation over the shorter 1954-2006 time period, a perhaps more appropriate time period during which the bank rate was actively used as a policy instrument. These results are presented in column (3). Here the overall fit is somewhat looser, perhaps reflecting the fewer degrees of freedom, but the general pattern of findings and statistical significance of the overall cointegration relationship is largely unchanged.

While the equations in columns (2) and (3) provide evidence of a equilibrium relationship, the standard errors of the coefficient estimates are likely biased by correlations arising among innovations in these variables. Hence to talk of the significance in relation to the different variables in the relationship, I use Saikkonen's adjustment procedure, the results of which are presented in column (4). As that column indicates, the coefficient estimates change only marginally from those found in the cointegrating vectors of columns (2) and (3). Hence, as expected, the long run nominal rate of interest is positively related to both inflation and real output and positively with the long run unemployment rate. Of the three interrelated variables, the unemployment rate is the least significant, but even its effect on the interest rate is significantly different from zero at five percent. Finally with cointegration appearing only after

the incorporation of a structural break in the relationship, the findings do suggest that the period of inflation targeting is distinctly different from the one earlier and one during which the nominal rate of interest was significantly lower.

Once a cointegrating relationship has been found, the effects of politics on policy can be tested for by examining whether political electoral influences (that are I(0) in nature) add to the explanation of short run movements in the interest rate about its equilibrium path (also I(0)). Hence to test for Abrams and Iossifov's policy coordination effects, the same party political variable, SP_DUMMY(1) + SP_DUMMY(2) was added to the error correction equation. Evidence of coordination opportunism again requires a negative coefficient that is significantly different from zero.

However, the use of error correction methodology to add I(0) political variables such as SP_DUMMY(1) + SP_DUMMY(2) to the test for political influence on monetary policy opens the door to the incorporation of other I(0) political variables as well. Hence in work on fiscal policy, for example, economists have found that the degree of political competition, measured inversely by the percentage of seats (or the popular vote) won by the winning electoral party, matters (Filer and Kenny, 1980; Solé-Ollé, 2006; Ferris, Park, and Winer, 2007). This suggests a second channel by which central bank independence could be affected. In essence, the political competition hypothesis argues that when political competition is weak (elections provide large winning majorities) the normal checks and balances on the political process are loosened in a parliamentary system and this will show up as excess in all dimensions of policy (i.e., larger government size and/or deficits in fiscal policy and lower interest rates in monetary policy). Using the percentage of seats won by the winning party, SEATS, as an (inverse) measure of

political competition, then a rise in SEATS reflects a lessening of political competition and predicts a lowering of the interest rate below what it would otherwise be. In addition to political competition, partisan ideology influence and periods of minority government have also been suggested as explicit political influences on policy. To represent these potential influences, I include the dummy variables, LIBERAL (taking the value 1 when the Liberal Party is in power), and MINORITY (taking the value 1 when neither governing party had a majority) in the error correction equation.[17] By including all political variables in the error correction equation, I test for four independent ways by which politics could affect monetary policy and hence central bank independence.

The error correction model corresponding to the cointegrating equation of column (3) is reproduced in columns (5) and (6) of Table 4, where column (6) re-estimates the equation in column (5) over the shorter 1954 - 2006 time period.[18] Here for presentational convenience, the second through fifth rows of the table are made to do double service – the column (5) and (6) entries now correspond to the coefficients of the first differences of same named variables (as indicated in the second line by the operator, D). Note that the error correction term is significantly negative in both these equations, as required for cointegration, indicating that departures of the bank rate from its long run equilibrium path are corrected through time. For the remaining economic variables (but without the same time series problems as those associated with the equations in Table 2) the error correction results reinforce many of the associations first suggested in that table. That is, the bank rate is associated positively with increases in the growth rate of real output (with persistence) and with increases in the inflation rate (although not significantly so). Hence the shorter frequency variations in the policy instrument, more indicative

of cyclical policy, replicate the relationships implied by the Taylor rule. On the other hand, only in the later time period is there any suggestion that short run changes in the bank rate respond counter-cyclically to changes in the unemployment rate, but even here the coefficient estimate is insignificantly different from zero. Finally, while the period of inflation targeting appears to have lowered the long run nominal interest rate, the same period has had only a weak negative effect on the size of interest rate changes over shorter business cycle frequencies.

The addition of the Abrams and Iossifov same party affiliation variable to the error correction model to test for political opportunism now generates evidence consistent with political opportunism.[19] When the party that appointed the current governor is in power, the interest rate is found to be lower than normal in the two year period leading into the next election. The result is somewhat strong for the shorter, later time period. However, of at least equal importance, the data also suggest that the degree of political competition matters for monetary policy. In particular, the larger is the majority of seats held by the winning political party (of either partisan persuasion) the lower has been the nominal rate of interest. This is consistent with monetary policy being more expansive in periods when political competition is weak. In both time periods, the effect of SEATS stands out as the most significant of the political variables. The remaining two political variables, LIBERAL and MINORITY, add additional support to the hypothesis of political influence in monetary policy. Both coefficients enter with their predicted sign and typically have coefficent estimates that are significantly different from zero. The only exception is that MINORITY is insignificant in its effect over the longer time period.

To the extent that any of these political variables influence monetary policy significantly, the case for central bank independence is weakened. In Canada's case all four political variables

have had some effect. Hence while the specific results in Canada do not reflect as strongly the Abrams and Iossifov way that politics appears to have affected U.S. monetary policy, the bottom line remains the same. The data is consistent with the hypothesis that politics has influenced Bank of Canada monetary policy.

V. Re-estimation of the Taylor Rule

In this section, the time series issues presented by the mixing of variables with different orders of integration is resolved by constructing a stationary representation of the Taylor rule test for Canada. This avoids the need to find a cointegrating vector among a set of I(1) variables and allows political variables to be added directly to the base case model since all test variables will now have the same order of integration, I(0). To do this I reformulate the estimating equation in the spirit of Woodford (2003). Instead of using the bank rate, LN_BANKRATE which is I(1), as the monetary policy instrument, I use the difference between the logarithm of the bank rate and the logarithm of the five year yield on government bonds, LN_R - LN_BANKRATE, which is I(0). Typically, the five year bond rate is above the bank rate so that contractionary monetary raises the bank rate relative to medium term yield on government bonds, reducing the spread between to two yields.[20] Hence the closing the gap between the two rates is contractive, while its broadening is expansionary. Note that by using the difference between two nominal rates of interest, changes in inflationary expectations should produce only a marginal effect on their difference (rather than each rate separately). This implies that changes in the difference will be more closely associated with induced changes in the (Wicksellian) real rate of interest away from the natural rate. Next on the right hand size, I use an explicit measure of the output gap, defined

here as the difference between LNRGDP and its predicted potential level. The latter is proxied by a forecasted value for LNRGDP.[21] Finally, the inflation gap in the equation is measured as the difference between the current rate of inflation and its targeted level. Here I follow the literature in assuming that the targeted level was constant over the period.[22]

To this revised base case Taylor rule I add the political variables used testing for political influences on central bank independence: first, the traditional measure of political opportunism, ELYEAR(1) + ELYEAR(2); then the Abrams and Iossifov refinement of that variable in same party affiliation, SP_DUMMY(1) + SP_DUMMY(2); then the degree of political competition, SEATS; the partisan nature of government, LIBERAL; and the role of played by minority government, MINORITY. All these variables are predicted to indicate expansionary pressure on monetary policy which if successful would widen the interest rate gap. Hence the prediction is that all these coefficient signs will be positive.[23]

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insert Table 5 here

The results are presented in Table 5. Columns (1) through (3) cover the shorter 1954-2006 time period, while column (4) repeats the broadest form of the test, from column (3), over the more extended 1935 to 2006 time period. In all four columns, the coefficients for the output and inflation gaps have their expected negative sign consistent with counter-cyclical monetary policy: the difference between the bank rate and medium term interest rates decreasing when the output gap and the inflation rate increase. However, while the output gap always has its expected sign, it is often insignificantly different from zero. Rather it is the inflation rate that is more consistently significant, perhaps signaling its greater importance as the variable targeted by the

Bank of Canada or, perhaps, signaling the greater difficulty in measuring the output gap. It is only when the twenty years before 1954 is added to the data, the period where it is argued that the bank rate was less important as policy instrument, were the inflation rate is found to be insignificant in its effect on the interest rate differential.[24]

The introduction of the political variables into the reformulated Taylor equation now leads to familiar set of findings. irst, the hypothesis of political opportunism in monetary policy appears to be rejected when the tradition variable representing opportunism, ELYEAR(1) + ELYEAR(2), is used. This is shown in column (1) where the coefficient estimate has the correct sign but is insignificantly different from zero. Then, when the Abrams and Iossifov same party affiliation variable, SP_DUMMY(1) + SP_DUMMY(2) is substituted for the traditional opportunism variable, the coefficient estimate does become significantly different from zero but only if we use the largest of the conventional confidence intervals at ten percent. This is shown in column (2). Nevertheless, while evidence for opportunism may be weak, the Abrams and Issifov test for opportunism does indicate consistently across our tests that accounting for same party affiliation in the implementation of monetary policy does make a difference and that the neglect of such coordinating considerations may well lead to the premature rejection of otherwise plausible theories of strategic behavior.

In columns (3) and (4) I add the remaining political variables. Interestingly, the addition of the three additional political variables results in an increase in the size and significance of the same party affiliation variable, now becoming significant at the five percent significance level over the 1954-2006 time period. As importantly, however, the variables are typically significant in their own right. Hence over both time periods, a decrease in political competition (a rise in

SEATS) is associated with an increase in the spread between interest rates and hence with looser monetary policy. The same tends to true of periods of Liberal Party and minority government. Here periods when the Liberal Party is in power are highly significant in their association with a narrowing of the interest rate spread while periods of minority government are only weakly associated, significant at ten percent only in the shorter 1954-2006 time period.

In short, the results for this reformulation of the test of Bank of Canada independence fall directly in line with those found earlier in the error correction model of Table 4. To the extent that these different measures accurately reflect monetary policy, the Bank of Canada does appear to have been influenced by political opportunism in the periods leading into elections, the degree of effective competition among political parties, the partisan nature of the political party in power, and, to some extent, by whether there has been a minority government or not. Some of these empirical relationships are weaker than others, however, their cumulative effect across the tests and across different political variables is, I think, fairly convincing. While the independence of Fed may have been compromised by periods of same party affiliation between the Governor of the Board and the President, the Bank of Canada appears in these tests to have been even more strongly compromised. To the extent that monetary policy by the Fed shows less of a response to the more traditional political variables, we can provisionally answer the question posed in the paper's title in the negative. Despite finding somewhat less support for political opportunism than did Abrams and Iossifov for the U.S., Canada does exhibit a plethora of other ways by which politics appears to have influenced monetary policy.

VI. Conclusion

In this paper I have used the recent findings of Abrams and Iossifov (2006) to initiate an inquiry into the independence of Canadian monetary policy from "political" influence. In some sense the results are as expected, consistent with the widely held notion that the Bank of Canada has less independent than the Fed. However, the results are also surprising in the myriad of ways that politics appears to have influenced the practice of monetary policy in Canada. For example, I while I find some support for Abrams and Iossifov's hypothesis that same party affiliation is needed to account for political opportunism, the data give only weak support to its presence in Canadian monetary policy. The same party dummy variable is found to be significant in its effect consistently, but only if the weakest conventional level of significance is used. On the other hand, on the other more traditional indicators of political influence, Canadian data is much more definitive. In all forms of our tests, the data suggest that monetary policy is more likely to be expansionary in periods when the Liberal Party is in power, when the degree of political competition is weak; and, to a lesser extent, when parliament is run by a minority government. Overall, it is the number and strength of these more traditional indicators of political influence that is impressive in their denial of independence. To the extent that the measures in these tests capture monetary policy, I conclude that politics has affected the behavior of the Bank of Canada in a way that is more overt and perhaps even more partisan than its U.S. counterpart.

In concluding it is important to recognize the weaknesses as well as the strength of this line of argument. In particular, the finding of a significant correlation between key political variables and indicators of policy and macroeconomic outcomes is consistent with causality running from the political to the policy to the outcome, but not conclusive evidence of that causality. Rather the correlations in the data could be consistent with reverse causation, the choice of a political event

(such as the date of an election) or an electoral outcome (as the victory of the Liberal party) arising on the basis of current or expected economic conditions and the policies likely to produce them. The ability to determine causation is notoriously difficult and seemingly impossible if all actions take place simultaneously. It was for this reason that I have emphasized the leads and lags needed to support the hypothesis of political causation, and, from that perspective, the data is consistent with political causation. On the other hand, even the elements of timing that support the political causation hypothesis are re-interpretable under reverse causation. Under rational expectations, for example, the anticipation of good times may lead an electorate to vote in a Liberal government and a political party that recognizes current central bank policy may use this to predict a desirable election date. It follows that until these more difficult issues of causality can resolved more definitively, the conclusions of this paper must remain conditional. Having said this, the evidence presented here is consistent with a political cycle in both monetary policy and its inflationary outcomes.

Appendix of Variables and Data Sources:

BANKRATE = Cansim II V122530 annualized

D = first difference operator

LN = the log operator.

GDP = gross domestic product in millions of current dollars. 1961-2006 Cansim II V498918 (aggregated from quarterly data).

RGDP = real GDP = GDP/P

GROWTH = LNRGDP - LNRGDP(-1)

GOV = Total Federal Government Outlays less interest on the Public Debt, Department of Finance, Fiscal Reference Tables 2006, Table 36.

USGROWTH = **LNIPIUS - LNIPIUS(-1)**

USINFLATION = USCPI = USCPI(-1)

IPIUS = 1935 -1970, Table A16. (BEA) Bureau of Economic Analysis;1971-1995: Cansim D360048 (1987=100);1996-1999, U.S. Department of Commerce, Business Cycle Indicators, Index of Industrial Production 1992=100; 1999-2006, www.federalreserve.gov/releases/G17.

P = GNP deflator before 1927 and GDP deflator after (1986 = 100). 1870-1926: Urquhart, (1993), 24-25;1927-1995 (1986=100): Cansim data label D14476; 1996-2001 Cansim D140668. All indexes converted to 1986 = 100 basis.

INFLATION = LNP - LNP(-1)

R = 5-10yr Government of Canada bond yield, Cansim II V122486, annualized

2. Political Variables and Data Sources:

The dating by year of each election reflects the first year that each governing party was in power. Hence if an election was held between January and June 30, the election was assigned to the actual calender year in which the election occurred. If the election was held between July and December, it was attributed to the following year. There were only two elections in July in the sample period, little is accomplished in the summer and elections in the fall or early winter do not leave enough time for a new government to alter spending programs before years end.

Data concerning SEATS differs from that on the official parliamentary web site for the period before 1945. Here I followed Beck (1968) who makes informed decisions over which small parties always supported the government and hence effectively should be counted as part of it. On this basis:

ELYEAR = 1 if an election year; = 0 otherwise.
SP_DUMMY = 1 if the Governor of the Bank of Canada was appointed by the same party as the incumbent governing party. See footnote 9 for details.
SEATS = percentage of the seats won (or effectively controlled) by the governing party.
SURPRISE = **LIBERAL*(1-SEATS)-(1-LIBERAL)*(1-SEATS)**
LIBERAL SURPRISE = LIBERAL*(1-SEATS)

Data Sources for political variables:
Beck, Murray, J. (1968). *Pendulum of Power*. Scarborough: Prentice Hall of Canada
Official web site of the Parliament of Canada: www.parl.gc.ca ((recording data provided by the Chief Electoral Officer)

Table 1
OLS Inflation Cycle Equations: 1935 - 2006
(Newey-West HAC t-statistics)

Independent/Dependent variables	**(1) Inflation Rate 1935 - 2005**	**(2) Inflation Rate 1935 - 2005**	**(3) Inflation Rate 1935 - 2005**	**(4) Inflation Rate 1954 - 2005**
Constant	-0.543 (1.16)	-0.880 (1.66)	-0.838 (1.43)	-0.875*** (1.99)
INFLATION(-1)	0.369* (3.74)	0.371* (3.88)	0.371* (3.52)	0.298* (3.04)
USGROWTH	0.027 (1.18)	0.030 (1.34)	0.023 (1.02)	0.049 (1.60)
USINFLATION	0.613* (3.49)	0.603* (3.50)	0.617* (3.39)	0.840* (5.10)
ELYEAR(1) + ELYEAR	0.690*** (1.92)	0.614*** (1.74)	0.664*** (1.82)	0.461*** (1.77)
SURPRISE	1.19* (2.50)			0.924** (2.05)
LIBERAL SURPRISE		2.14** (2.41)		
LIBERAL			0.754*** (1.89)	
Statistics				
No. of observations	71	71	71	52
R^2	.697	.698	0.690	0.882
DW	1.64	1.65	1.62	1.62
Akaike info criterion	4.05	4.05	4.07	3.07

SURPRISE = [LIBERAL*(1- SEATS) - (1-LIBERAL)*(1-SEATS)] where SEATS = percentage of seats won by the governing party
LIBERAL SURPRISE = LIBERAL*(1-SEATS)
LIBERAL = 1 for years when the Liberal Party was in power, 0 otherwise.

Table 2

OLS Monetary Policy Regressions using the Bank Rate

(Newey-West HAC t-statistics in brackets)

	(1) LnBankRate 1936-2004	(2) LnBankRate 1936-2004	(3) LnBankRate 1954-2004	(4) LnBankRate 1954-2004
Constant	-0.491 (0.886)	-0.694 (1.15)	-0.055 (0.057)	-2.93** (2.04)
LNBANKRATE(-1)	0.871* (12.36)	0.869* (12.01)	0.730* (7.82)	0.613* (5.27)
LNRGDP	0.048 (0.935)	0.065 (1.17)	0.030 (0.362)	0.283** (2.20)
INFLATION	0.023* (2.72)	0.022* (2.67)	0.045* (4.05)	0.030* (2.92)
ELYEAR(1) + ELYEAR(2)	0.015 (0.331)			
SP_DUMMY(1) + SP_DUMMY(2)		-0.073 (1.50)	-0.086*** (1.73)	-0.080 (1.64)
INFLATION TARGETING				-0.354* (3.41)
Statistics No. Of Obs. AdjR^2 D.W. Akaike criterion MacKinnon critical values for eq. with five at 1% = - 4.77 six at 1% = -5.11	 69 0.882 2.16 -0.032 -8.88*	 69 0.884 2.15 -0.051 -8.87*	 51 0.805 2.23 0.029 -8.04*	 51 .822 2.14 -0.045 -7.67*

* (**)[***] significantly different from zero at 1% (5%) [10%]

Table 3

Descriptive Statistics: 1935 - 2006

Variable name	Mean	Standard Deviation	Maximum	Minimum	Skewness	ADF level (constant)	ADF difference (none)
LNRGDP	12.45	0.868	13.71	10.72	-0.303	-2.24	-5.69*
GROWTH	4.24	3.24	15.8	- 3.25	3.24	-5.56*	
INFLATION	3.86	3.07	13.42	-0.95	1.25	-2.89***	-9.81*
USGROWTH[t]	4.08	7.80	22.10	-23.42	0.624	-7.34*	
USINFLATION	3.59	2.76	11.70	-2.29	0.858	-2.95**	-10.46*
ELYEAR	0.305	0.464	1	0	0.844	-8.05*	
SURPRISE	0.221	0.348	0.587	-0.578	-1.112	-4.20*	
SP_DUMMY	0.125	0.333	1	0	2.27	-8.50*	
LNBANK_RATE	1.47	0.662	2.89	0.405	0.092	-1.64	-9.12*
LNR	1.69	0.483	2.72	0.940	0.195	-0.984	-7.10*
LNURATE	1.79	0.531	2.65	0.336	-0.805	-2.17	-7.32*
LNGSIZE	2.72	0.314	3.75	1.98	0.862	-0.193	-6.33*
YGAP	0.0	0.022	0.079	-0.053	0.298	-7.95*	
LNR-LNBANKRATE	0.220	0.231	0.219	-0.224	0.345	-3.71*	
SEATS	0.599	0.109	0.785	0.413	0.268	-3.83*	
LIBERAL	0.750	0.436	1	0	-1.155	-3.49*	
MINORITY	0.155	0.364	1	0	1.91	-4.44*	

*(**)[***] significant at 1 (5) [10] percent using MacKinnon critical values

[t] growth rate of the U.S. index of industrial production

YGAP = LNRGDP - LNRGDP(PREDICTED)

LNR_DIF = LNR - LNR_BANK_RATE

Table 4
OLS Monetary Policy Cointegration -Error Correction Equations

(t-statistics in brackets)#

	(1) LnBankRate 1936-2006	(2) LnBankRate 1936-2006	(3) LnBankRate 1954-2006	(4) LnBankRate 1937-2005 **Saikkonen#**	(5) D(LnBank 1936-2004 Error	(6) Rate) 1954-2004 Correction
Constant	-4.96 (6.21)	-7.64 (11.78)	-6.04 (3.65)	-6.86* (7.58)	**0.577**** **(2.60)**	**0.697**** **(2.22)**
LNRGDP **D(LNRGDP)**	0.500 (7.81)	0.665 (11.51)	0.519 (3.49)	0.592* (7.47)	**1.26** **(1.18)**	**2.05** **(1.09)**
INFLATION **D(INFLATION)**	0.060 (3.30)	0.032 (2.48)	0.058 (3.06)	0.037** (2.05)	**0.014** **(1.37)**	**0.037** **(1.51)**
LNURATE **D(LNURATE)**		0.518 (7.13)	0.594 (3.50)	0.639* (6.59)	**0.084** **(0.555)**	**-0.186** **(0.650)**
Inflation Targeting **D(Inflation Target)**		-0.973 (8.17)	-0.802 (4.66)	-0.925* (5.52)	**-0.351***** **(1.73)**	**-0.037** **(1.29)**
D(LNRGDP(-1))					**2.17**** **(2.46)**	**2.71***** **(1.79)**
Error Correction Term (resid(-1))					**-0.434*** **(4.53)**	**-0.333*** **(2.63)**
SP-DUMMY(1) + SP_DUMMY(2)					**-0.091***** **(1.76)**	**-0.138**** **(2.20)**
SEATS					**-0.918*** **(2.76)**	**-1.104**** **(2.38)**
LIBERAL					**-0.145**** **(2.14)**	**-0.175**** **(2.08)**
MINORITY					**-0.139** **(1.50)**	**-0.243**** **(2.19)**
Statistics				.		
No. Of Obs.	72	72	53	69	69	51
AdjR^2	0.499	0.818	0.695		0.359	0.416
D.W.	0.291	0.933	0.995		2.00	2.14
Akaike criterion	1.36	0.376	0.473		-0.332	-0.145
MacKinnon critical value	-2.33					
3 vars. at 5% = - 3.34						
4 at 5% = - 3.78		-4.61*	- 4.26**			
5 at 5% = - 4.12						

 # Saikkonen's (1991) estimator adjusts for inconsistency in the standard errors of the I(1) variables in the cointegrating equation by including the contemporaneous, lagged and led values of the first differences of both left and right hand side variables (with the exception of the dummy variables). Only the coefficients of the level terms are relevant and so presented. The standard errors and t-statistics of the augmented regression are then adjusted for the presence of correlation among the innovations of the I(1) variables by a factor formed by the ratio of two standard errors a) the standard error of the augmented equation divided by b) the "long run standard error". The latter is calculated as the square root of the variance plus two times the weighted sum of the significant autocovariances among the residuals. This adjustment led to the originally estimated t-statistics in column (5) being multiplied by the factor .840.

Table 5
Revised Taylor Rule Equations
(Absolute values of Newey-West HAC t-statistics)

	(1) LNR - LNBANKRATE 1954-2004	(2) LNR - LNBANKRATE 1954-2004	(3) LNR- LNBANKRATE 1954-2004	(4) LNR- LNBANKRATE 1937-2004
Constant	0.166** (2.50)	0.166* (2.76)	-0.337 (1.68)	-0.320*** (1.86)
YGAP(-1)	-1.90 (1.16)	-1.76 (1.15)	-2.46*** (1.95)	-2.54* (2.91)
INFLATION	-0.023* (2.53)	-0.023* (2.66)	-0.027** (2.59)	-0.006 (0.722)
ELYEAR(1) + ELYEAR(2)	-0.037 (1.06)			
SP_DUMMY(1) + SP_DUMMY(2)		0.063*** (1.86)	0.073** (2.22)	0.039 (1.36)
(LNR-LNBANKRATE)(-1)	0.301** (1.99)	0.318** (2.12)	0.151 (1.15)	0.552* (3.80)
SEATS			0.663** (2.22)	0.532** (2.10)
LIBERAL			0.194* (3.67)	0.142** (2.46)
MINORITY			0.112*** (1.83)	0.041 (0.683)
Statistics				
No. of observations	51	51	51	68
AdjR^2	.339	.355	.443	0.512
D.W.	1.98	2.02	1.84	2.04
Akaike info criterion	-0.691	-0.715	-0.812	-0.667

* (**) [***] significantly different from zero at 1% (5%)[10%]
YGAP = LNRGDP - forecasted LNRDGP where forecasted LNRGDP = 0.941 + 0.827LNRGDP(-1) + 0.028LNURATE(-1) + 0.290LNIIPUS - 0.112LNIIPUS(-1).

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Notes

1. I would like to thank Marcel Voia and, particularly Soo-Bin Park, who nicely led me out of a problem with lags. Neither are responsible for my remaining errors of omission or comission.

2. Interestingly, the original architects of the Bank of Canada designed the Bank as a private corporation with widely distributed shares and government participation restricted to the appearance of the Deputy Minister of Finance as a non voting member of the Board of Governors. Subsequent legislation, however, completely reversed this separation by making the government the exclusive owner of the Bank's shares. It did retain restrictions on government's ability to attend Board meetings and to participate in day-to-day operations of the Bank. Thiessen (2000, p.3).

3. The relevant legislation reads "If, notwithstanding the consultations provided for in subsection (1), there should emerge a difference of opinion between the Minister and the Bank concerning the monetary policy to be followed, the Minister may, after consultation with the Governor and with the approval of the Governor in Council, give to the Governor a written directive concerning monetary policy, in specific terms and applicable for a specified period, and the Bank shall comply with that directive.

4. In their cross country rankings of Central Bank independence between 1955 and 1988, Alesina and Summers (1993) rank Canada as lying somewhere in the middle, 2.5 out of 4, where higher values represent greater independence. Hence the Bank of Canada was seen as somewhat more independent than the Central Banks of such countries as Australia, the United Kingdom, and France (at 2.0) but less independent than countries such as the U.S. (at 3.5) and both Germany and Switzerland (at 4.0).

5. The inflation rate in Canada is defined as the rate of growth of the GDP deflator. US output growth is measured as the rate of growth the U. S. Index of Industrial Production and the U.S. inflation rate is defined as the rate of growth of CPI prices. See the statistical appendix for sources and greater detail. All are I(0).

6. Abrams and Iossifov use a seven quarter policy lag in their test using quarterly data.

7. Note that in this formulation I assume that the output (inflation) gap varies directly with the level of real output (inflation). See the following sections for a reworking of the test when the natural rate of output is assumed to vary and so is forecasted.

8. Canada's parliamentary form of government requires that an election be held within five years of a government's election but can come more frequently if the government loses a vote of confidence and/or chooses to resign early. There were 22 federal elections in the 72 years covered by our time period, roughly one every 3 1/3 years.

9. The Governors of the Bank of Canada were:

1934 - 1954	Graham Towers, appointed by a Conservative Government
1955 - 1961	James Coyne, appointed by a Liberal Government
1961 - 1973	Louis Rasminsky, appointed by a Conservative Government
1973 - 1987	Gerald Bouey, appointed by a Liberal Government
1987 - 1994	John Crow, appointed by a Conservative Government

1994 - 2001 Gordon Thiessen, appointed by a Liberal Government
2001 - David Dodge, appointed by a Liberal Government.
There were nine occasions over our 72 year time period (and twenty two elections) when the incumbent government and the Governor were associated with the same party.

10. The bank rate changed only three times over the first twenty years of the Bank's existence. By choosing 1954 as the initial date for the shorter time period, I separate those time periods from ones where the bank rate began to fluctuate annually--consistent with the hypothesis that the Bank was now actively using the bank rate as an instrument of monetary policy.

11. Note that the significance of inflation in the equation rises while output falls. This is consistent with the emerging importance of the bank rate as an instrument for fighting inflation and perhaps also a signal of the weakness of real output as a measure of the output gap, a concern that is taken up in the next sections of the paper.

12. The level of significance, however, still remains relatively low.

13. In particular, LNR_BANK_RATE and LNRGDP become stationary only after first differencing (and so both are I(1)), while INFLATION is on the margin--stationary at the 10 per cent significance level and stationary in first differences.

14. Here INFLATION is treated as being I(1).

15. As additional right hand side variables are added to the equation, the ADF criterion for stationarity across the equation's residuals tightens. These have been calculated in MacKinnon (1996). Their value relative to the MacKinnon critical values are included on the bottom line of Table 4.

16. When the cointegrating equations were run separately before and after the proposed break in 1991, the separate ADF statistics rose now consistent with cointegration in each of the two separate parts. The ADF statistics for the period 1935 through 1990 was -4.73 and for 1991 through 2006 was -3.97. The former is significantly different from zero at the one percent significance level while the latter falls just outside of the five percent significance level.

17. The Liberal Party was the more liberal of the major parties contesting each election over this time period. Hence the partisan prediction tested is that interest rates would be lower than otherwise in periods when the LIBERAL party formed the governing party. There were seven periods of minority government over our time period. Writers such as Kontopolous and Perotti (1999) and Persson, Roland and Tabellini (2004) use common pool arguments to predict expansionary behaviour during periods of minority government.

18. The error correction model was run with two lags for all variables. However, with the exception of D(LNRGDP) none of second lagged variables were significant. For this reason only the shorter version represented in column (5) is reported.

19. Use of ELYEAR(1) + ELYEAR(2) instead of SP_DUMMY(1) + SP_DUMMY(2) results in a coefficient estimate that is once again negative but insignificantly different from zero (i.e. for the time period 1935-2006 the coefficient estimate was -0.061 with a t-statistic of -1.50, all other coeficient estimates largely unchanged).

20. There were periods, particularly between 1975 and 1976, 1979-1981, and between 1989 and 1990 when the bank rate rose above the 5 year yield on government bonds. In this case tighter monetary policy implied a bigger negative number (a similarly measure of increased tightness).

21. The equation used for YGAP was: LNRGDP = 0.9414771316 + 0.8265798669*LNRGDP(-1) + 0.02751755521*LNURATE(-1) + 0.290153733*LNIIPUS_REV - 0.1117168962*LNIIPUS_REV(-1).

22. As discussed earlier, INFLATION can be considered only if a ten percent confidence interval is accepted.

23. This test (as was the case in the error correction model) also found that the period of inflation targeting had no significant effect on the interest rate differential. This is consistent with inflation targeting producing a significant downward adjustment in the levels of both interest rates separately (as suggested in Tables 2 and 4) but with both interest rates changing more or less equivalently.

24. If I had instead used a two year forecast of the rate of inflation is used (and impose rational expectations to substitute actual two year future value for the current forecasted rate), the equation works equally well. For example, doing in the equation of column (2) leads to a coefficient estimate of -0.019 and a t-statistic of -2.10. This representation also results in the output gap becoming significantly negative (with a coefficient estimate of -3.01 and a t-statistic of -1.91.