On the history of an acquisition:

The National Bank of Canada revisited

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et

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Variations sur l'histoire d'une acquisition:
La Banque Nationale du Canada revisitée

Résumé : La fusion de la Banque Canadienne Nationale et de la Banque Provinciale du Canada relevait de la loterie pure. Les deux banques, concentrées au Québec, étaient très similaires dans leurs structures et toutes deux faisaient face à une détérioration de leurs sources de revenus et à une explosion de leurs coûts d'opérations. Elles partageaient donc les mêmes problèmes financiers. La Banque Nationale du Canada vécut des moments très difficiles au cours de ses premières années. Elle éprouvait beaucoup de difficultés à contrôler sa marge d'intérêt et ses coûts sur toile de fond d'inflation galopante et de hausses marquées de taux d'intérêt. En tirant parti du mouvement de déréglementation financière—notamment en se portant acquéreur de Lévesque-Beaubien et Geoffrion-Leclerc intégrés par la suite à la Financière Banque Nationale—elle s'est impliquée davantage dans le banking universel et est devenue même très compétitive au chapitre de ses revenus autres que d'intérêt. Cependant, la Banque Nationale a de nouveau connu des temps austères au cours de la crise des subprimes, étant très impliquée dans le négoce du papier commercial adossé à des actifs (ABCP) dont le marché s'est effondré durant la crise. Mais, à l'instar des autres banques canadiennes, ses sources de revenus se sont stabilisées depuis. Même si sa marge d'intérêt et son ratio de revenus autres que d'intérêt sont plus faibles que ceux des autres banques, la Banque Nationale a retrouvé le contrôle de ses coûts d'opération, ce qui lui assure un rendement concurrentiel sur ses actifs.

Mots-clefs : Banque; fusion; processus de retour vers la moyenne; modèles stochastiques; activités traditionnelles; activités hors-bilan.
Classification JEL : G20; G21.

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Abstract: The merger of the Canadian National Bank and the Provincial Bank of Canada was a pure bet. The two banks, concentrated in Quebec, were very similar in their structures and both were confronted to a deterioration of their sources of revenues and to a jump in their operating costs. Hence, they were sharing the same financial problems. The National Bank of Canada has known very difficult times after the merger. It had difficulty in controlling its interest margin and costs in a climate of climbing inflation and interest rates. Taking advantage of the financial deregulation process—especially by acquiring Lévesque-Beaubien et Geoffrion-Leclerc merged thereafter to become Financière Banque Nationale—it got more involved in universal banking and even became very competitive regarding its banking fees. However, National Bank was again confronted to bad times during the subprime crisis, being very involved in the trading of asset-backed commercial paper (ABCP) whose market collapsed during the crisis. In line with most Canadian banks, its sources of income have been more stable since the end of the crisis. Even if its interest margin and its non-interest income ratio are lower than the ones of the other banks, National Bank manages its costs tightly, which explains its competitive return on assets.

Keywords : Bank; Merger; mean-reverting process; stochastic models; traditional banking; off-balance-sheet banking.
JEL classification: G20; G21.

1. Introduction

At the end of the seventies, *Canadian National Bank* merged with *Provincial Bank of Canada* to form the *National Bank of Canada[1]*. The activities of both banks were concentrated in Quebec, Canada. These banks felt on bad times at the beginning of the second half of the seventies. Following the world exchange crisis in 1973 and the concomitant jump in inflation, there was a bounce in interest rates. This event was very damaging for the financial results of both banks whose duration of assets was much longer than duration of liabilities— especially deposits. These banks had also great difficulties in controlling their operating costs, which were too high relatively to net interest income, the major source of their revenues. The situation was so degenerating that financial regulation institutions made pressure for a merger of the *Canadian National Bank* and the *Provincial Bank of Canada*. The fiscal year 1979-1980 was the first of the *National Bank of Canada*, resulting from the merger of *Provincial Bank of Canada* and *Canadian National Bank*.

It is rare to observe a case of pure merger. In fact, it was *Provincial Bank of Canada* which acquired *Canadian National Bank*, even if in the facts this was considered as a merger. Following this acquisition, the direction of *Provincial*

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[1] As of October 31th 2015, the total assets of the *National Bank of Canada*, excluding off-balance-sheet assets, amount to $216 billion, for a market share of 4.92% in the Canadian banking system. The total assets of the biggest Canadian bank—i.e., *TD Bank Financial Group*—are equal to $1104 billion at the end of the fiscal year 2014-2015, which represents a market share of 25.13%. It is followed closely by the *RBC Financial Group* whose assets amount to $1074 billion, for a market share of 24.55%. These two big banks thus represent 50% of the assets of the Canadian banking system. Note that as of October 31th 1996, the assets of these three banks were $53 billion, $130 billion and $231 billion, respectively, for corresponding market shares equal to 5.53%, 13.56% and 24.09%. The *TD Bank Financial Group* has thus registered a remarkable growth of its assets since 1996. Indeed, the compounded annual growth rate of its assets is equal to 11.9% from 1996 to 2015, compared to rates of 8.4% for the *RBC Financial Group* and 7.7% for *the National Bank of Canada*.

Bank of Canada took the lead of the new bank. The previous direction of *Canadian National Bank* was fired or downgraded. New employees were hired to change the image of the bank. Some were stars coming from other big banks. However, instability remained for a long time in the new bank because its direction had difficulties in controlling operating costs and because the opening of the eighties was marked by the first oil crisis, which propelled interest rates to new highs, and by the repudiation of many sovereign debts, in which the two banks were quite involved.

In this article, we revisit the merger of *Canadian National Bank* and *Provincial Bank of Canada*. As shown later, these banks shared the same financial problems at the time of the merger. They were too concentrated in Quebec. The structure of their loan portfolios was also quite similar. In this context, it was very difficult to have synergy effects. Diversification effects were also almost impossible because of the too great similarities between the two banks. The recovery of the return on assets (*ROA*) of *National Bank* does not seem to be due to the beneficial impact that a merger is supposed to produce. In fact, the stock of the *National Bank* was doomed to remain undervalued for quite a long time. Indeed, its book value was high relative to its market value. This source of concern for the new direction of *National Bank* was associated with low growth prospects for the new bank. The return of prosperity at the *National Bank* is more due to special circumstances, like the amendment of the Canadian *Bank Act* in 1987 which allowed banks to buy brokers and the Amendment in 1992 which allowed banks to get involved in fiduciary activities.

In this respect, the bricks and mortar network of *National Bank* has never been very profitable.

## 2. The structures of the two «merged» banks

Figure 1 plots the evolution of the net interest margin[2] (per $100 of assets)—or net interest spread—for the two merged banks and for the whole Canadian banking system from 1967 to 1983. We note that the two merged banks had initially an interest margin which was much higher than the one of the other Canadian banks. Actually, both banks were more involved in residential mortgage and personal loans—i.e., retail activities—than their counterparts, these categories of loans having a high interest spread when interest rates are low and stable, as was the case at the end of the sixties and at the beginning of the seventies. These two banks were also more invested in sovereign loans in proportion of their assets than the other banks. These loans have obviously a higher spread than the «average» loan because of the greater credit risk they embed. The *Provincial Bank of Canada* had the highest interest margin of the two. It exceeded 3% at the end of the sixties, which is quite high compared to a mean spread of about 1.5% today. But these "golden" spreads, which were a source of wealth at the beginning of the seventies, would become a source of distress at the end of this decade.

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[2] i.e., interest income less interest expenses, expressed per $100 of assets.

However, the climbing of interest rates which begun after the world exchange crisis in 1973 and the following explosion of inflation led to a general decrease in the interest rate spread of Canadian banks. This decrease was not restricted to the two merged banks but was shared by most Canadian banks. Mortgage and personal loans—whose duration was long—were funded by short-term deposits. There was therefore a high duration gap between loans and deposits. Today, this gap can be hedged using derivatives[3]. But in the seventies, the derivatives market was only in its infancy. It was not possible to rely on such a market to hedge the gap which was tumbling down. A better matching between the durations of assets and liabilities was the only solution.

Figure 1

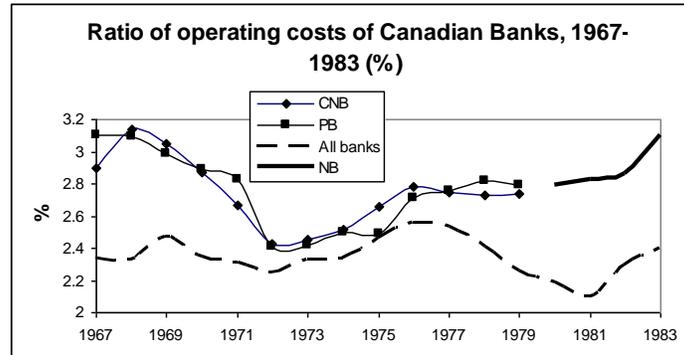**Interest rate spread (net interest margin) of Canadian banks, 1967-1983**
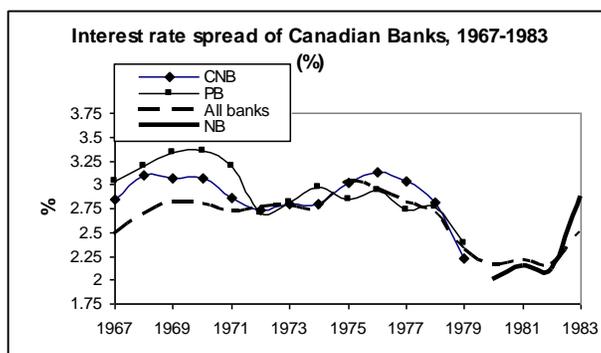
Notes: Canadian National Bank; PB: Provincial Bank of Canada; NB: National Bank of Canada.
Sources: A.E. Ames; Bank of Canada; Banks' annual reports.

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[3] For instance, it can be hedged by an interest rate swap, in which floating-rate cash-flows are swapped for fixed-rate cash-flows. Obviously, there has been a considerable improvement in bank risk management from the beginning to the end over our sample period.

What was dramatic for the two banks was that the interest spread lied on an expenses ratio which was higher than the one of other banks. As mentioned previously, this higher interest rate spread was due to a greater involvement of these banks in retail activities compared to other banks which were more concentrated in *gross* banking activities—like commercial loans for which the interest rate spread is quite low. However, it is well-known that retail activities require a larger network of branches which is expensive, to say the least. These activities also require more employees in term of assets. The two banks had also more branches in "regions" or small localities than the other Canadian banks— another explanation for their higher ratio of operating costs. For instance, at the beginning of the seventies, the ratio of operating costs was 2.87% at *Canadian National Bank* and 2.89% at *Provincial Bank of Canada* versus 2.35% for all Canadian banks. This ratio was therefore quite higher at the two Quebec banks. Note that these operating costs ratios included provisions for loan losses at this time, which is no longer the case today.

Figure 2

Ratio of operating costs of Canadian banks, 1967-1983 (%)

Ratio of operating costs of Canadian Banks, 1967-1983 (%)

Notes: Canadian National Bank; PB: Provincial Bank of Canada; NB: National Bank of Canada.
Sources: A.E. Ames; Bank of Canada; Banks' annual reports.

In Figure 2, we note that the two banks had problems to control their costs after the crisis of 1973. The swelling of inflation wrote off the preceding efforts to control costs. The ratios of operating costs of *Canadian National Bank* and *Provincial Bank of Canada* resume their climbing, which was not the case for the other Canadian banks which cut down their expenses. Their operating costs ratio thus decreased importantly (Figure 2). They fired employees and shut down many branches. This compensated for the contraction of the interest rate spread. However, our two banks delayed too much this skimming process with the consequence that their cost ratio was propelled near new highs. The merger of the two banks did not stop this process. The ratio increased even more after the date of the merger. Actually, a merging process is costly. It takes time to rationalise operations.

Being more involved in retail activities than the other Canadian banks, our two merging banks had a higher ratio of non-interest income per $100 of assets

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in the sixties and in the beginning of the seventies. They cashed more money from financial services fees[4]. In Figure 3, we note that the ratio of non-interest income exceeded 1% at the two banks at the end of the sixties but was close to 0.8% at the other banks. This ratio co-moved with the interest rate spread in the seventies for the two Quebec banks, perhaps because the competition on services fees emanating from the other banks gained strength[5]. There was also some reduction in this ratio for the other banks but it was less severe.

The decrease in the ratio of non-interest income was very detrimental for our two banks because the gap between the interest rate spread and the operating costs ratio was so low in the seventies. Really, the ratio of non-interest income was difficult to manage because it depends mainly on the demand for financial services fees. Today, this ratio is much higher for Canadian banks because the revisions of the *Bank Act* in 1987 and 1992 allowed banks to get involved in brokerage and fiduciary activities. Therefore, the ratio of other income is near 1.6% today. However, in the seventies, non-interest income was a smaller source of cash-flows for banks. As argued previously, it was very important to compensate the small gap between the interest rate spread and operating costs of the *Canadian National Bank* and the *Provincial Bank of Canada.* However, in the seventies, the ratio of non-interest income per $100 assets was decreasing quickly, which was an important cause of headaches for both banks.

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[4] Note that some financial banks then took advantage of a loophole in the Quebec financial legislation which allowed them to be involved in brokerage activities before the launching of the financial deregulation process in Canada which took place in 1987. For instance, in 1983, the Quebec Government launched a stock savings plan in which individuals could subscribe by resorting to Quebec financial institutions, including banks. The restrictions on the share of stocks issued by a broker whom a Quebec financial institution may hold were also removed. These amendments represented additional sources of non-interest income for Quebec institutions.

[5] i.e., the net interest margin and the ratio of non-interest income were decreasing.

Figure 3

Ratio of non-interest income (other income) of Canadian Banks, 1967-1983
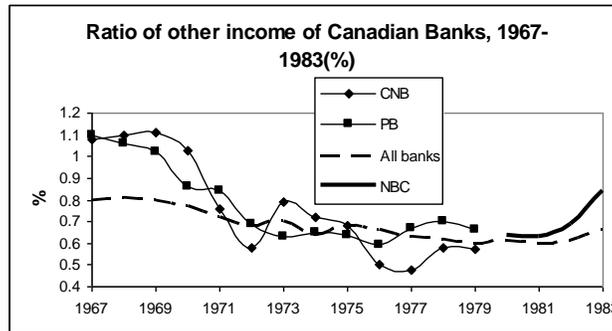
(%)

Ratio of other income of Canadian Banks, 1967-1983(%)

Notes: Canadian National Bank; PB: Provincial Bank of Canada; NB: National Bank of Canada.
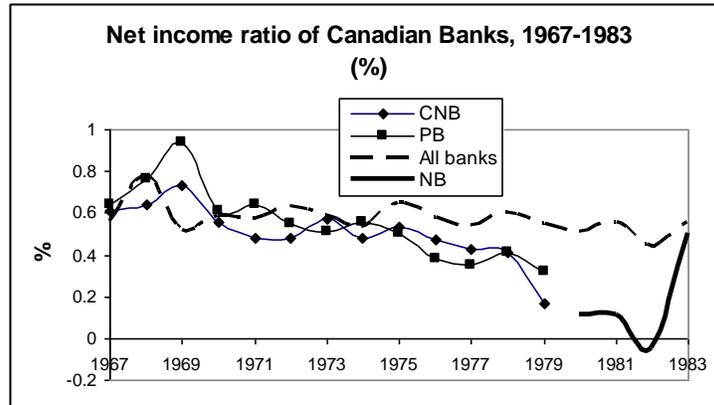*Sources:* A.E. Ames; Bank of Canada; Banks' annual reports.

The evolution of the financial ratios of the *Canadian National Bank* and of the *Provincial Bank of Canada* in the seventies was precipitating these two banks to bankruptcy. Figure 4 shows the severe deterioration of their net income ratio (*ROA*)[6] beginning in 1973. The decrease in this ratio was substantial for both banks while it was quite stable for the other Canadian banks. The other banks composed with the bad financial climate of this time by reducing drastically their operating costs, which is the most adjustable component of financial results in the short-run. Our two banks delayed this operation and that was an error. At the end of the fiscal year 1978-1979, the return on assets collapsed to 0.17% at the *Canadian National Bank* but, at 0.32%, it was higher

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[6] i.e., return on assets.

at the *Provincial Bank of Canada*, which puts this bank in a position of power in the upcoming merger which took place in the fiscal year 1979-1980.

Figure 4

ROA of Canadian banks, 1967-1983

Net income ratio of Canadian Banks, 1967-1983 (%)

Notes: Canadian National Bank; PB: Provincial Bank of Canada; NB: National Bank of Canada.
Sources: A.E. Ames; Bank of Canada; Banks' annual reports.

The average *ROA* observed at the two banks in the second half of the seventies was obviously insufficient to maintain these banks in business. The *ROA* of the Canadian banks follows a stochastic mean-reverting process which is perhaps not obvious in Figure 4 because the reported period was very unstable for Canadian banks. A mean-reverting process takes the following form[7]:

$$dR = \eta\left(\overline{R} - R\right)dt + \sigma\,dz \qquad (1)$$

In this equation, $\overline{R}$ is the mean level to which the ratio R returns in the long-run. η is the speed at which R returns to $\overline{R}$. σ is the volatility of the process, dt is a small time increment and dz is a Wiener process, that is $dz = \varepsilon\sqrt{dt}$, with $\varepsilon \sim N(0,1)$. The

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[7] On the estimation of stochastic processes, see: Gouriéroux and Montfort (1996). See also Racicot and Théoret (2006).

expectation of dz is equal to 0 and its variance is dt. A mean reverting process is estimated by the following equation using ordinary least squares (OLS):

$$R_t - R_{t-1} = \beta_0 + \beta_1 R_{t-1} + \varepsilon_t \qquad (2)$$

The parameters of equation (1) are estimated by equation (2). These parameters of the mean reverting process are retrieved as follows[8]:

$$\overline{R} = -\frac{\hat{\beta}_0}{\hat{\beta}_1} \qquad (3)$$

$$\hat{\eta} = -ln\left(1 + \hat{\beta}_1\right) \qquad (4)$$

with $\hat{\beta}_1 > -1$

$$\hat{\sigma} = \hat{\sigma}_\varepsilon \sqrt{\frac{2\,ln\left(1 + \hat{\beta}_1\right)}{\left(1 + \hat{\beta}_1\right)^2 - 1}} \qquad (5)$$

We can also choose an estimation method based on the maximum likelihood estimator (MLE). Let us assume that the dependent variable of the regression is labelled y and that the explanatory variable is named x. The maximum likelihood function, designated by $\iota(.)$, is written as follows:

$$\iota(c, \beta, \sigma) = -\frac{T}{2} ln\left(2\pi \times \sigma^2\right) - \left\{\left(\frac{1}{2\sigma^2}\right)\sum_{t=1}^{T}\left(y_t - c - \beta x_t\right)^2\right\} \qquad (6)$$

with $\left(y_t - c - \beta x_t\right)$, the residuals (innovation) of the regression, which we designate by ε_t. We maximise this function with respect to c, β and σ to obtain the estimated values of these three parameters.

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[8] More details on the estimation of the mean reverting process of *ROA* of the Canadian banks can be found in: Coën and Théoret (2004) and in <u>Finance computationnelle et gestion des risques</u> (2006) written by François Racicot and Raymond Théoret.

We must compute the conditional expectation of R_t and its conditional variance in order to proceed with the MLE method. For a mean reverting process, the conditional expectation of R_t is[9]:

$$E(R_t) = e^{-\eta} R_{t-1} + \overline{R}\left(1 - e^{-\eta}\right) \qquad (7)$$

The residuals which directly enter in the likelihood function are therefore:

$$R_t - E(R_t) = R_t - e^{-\eta} R_{t-1} - \overline{R}\left(1 - e^{-\eta}\right) \qquad (8)$$

Otherwise, the conditional variance of R_t is:

$$Var(R_t) = \frac{\sigma^2}{2\eta}\left(1 - e^{-2\eta}\right) \qquad (9)$$

By using these equations, we obtain the MLE specification of a mean reverting process in language EViews, which appears in the Appendix. We estimated the mean reverting process of the *National Bank*'s *ROA* over the period 1988-2003, because it was less volatile than over the period 1967-1983 which is used to analyse the merger of the *National Bank*. The Appendix also displays the result of this MLE estimation.

The data used are expressed on a quarterly basis. The estimated annualised long-term level of the *National Bank*'s *ROA* is equal to 0.52 (0.13 x 4). This coefficient is significant at the 95% confidence level according to Table 1. The speed of return of this ratio to its long-term level is estimated at 3.22, which is quite quick. Table 1 also gives the estimated parameters of the mean-reverting process of the *ROA* of the two Canadian biggest banks using the two methods explained earlier: OLS and MLE

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[9] See Gouriéroux and Montfort (1996) and Racicot and Théoret (2006).
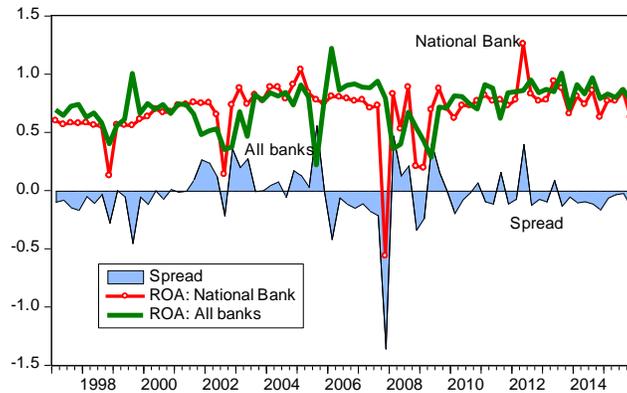
Table 1

Estimation of the mean reverting process of the net income ratio (*ROA*) of some Canadian banks by OLS and MLE, 1988-2003

	Long-term ratio		η		σ	
	OLS	MLE	OLS	MLE	OLS	MLE
Total banks	0.61	0.61	3.22	3.22	0.31	0.10
	(6.97)	(11.45)	(7.49)	(0.98)		(0.91)
RBC	0.67	0.67	2.63	2.63	0.37	0.14
	(6.57)	(5.33)	(7.27)	(1.36)		(1.36)
TD	0.68	0.68	0.60	0.60	0.24	0.40
	(3.51)	(5.33)	(4.24)	(2.56)		(1.73)
NBC	0.52	0.52	3.29	3.29	0.57	0.17
	(4.09)	(5.80)	(7.50)	(0.74)		(0.70)

Update : 1997-2015

	Long-term ratio		η		σ	
	OLS	MLE	OLS	MLE	OLS	MLE
Total banks	0.73	0.73	0.76	0.76	0.23	0.21
	(5.02)	(19.47)	(5.16)	(3.42)		(2.19)
RBC	0.80	0.80	2.12	2.12	0.50	0.34
	(7.28)	(24.49)	(7.57)	(1.92)		(1.79)
TD	0.73	0.73	0.96	0.96	0.60	0.61
	(4.87)	(7.51)	(5.67)	(3.34)		(3.31)
NBC	0.70	0.70	1.70	1.70	0.43	0.13
	(6.76)	(15.01)	(7.11)	(3.13)		(2.57)

Notes: RBC: Royal Bank of Canada; TD: Toronto Dominion Bank; NBC: National Bank of Canada. Statistics t are in parentheses.

We note in Table 1 that we obtain identical coefficients with the two regression methods for the long-term level of *ROA* and for the coefficient of adjustment speed over the period 1988-2003. *National Bank of Canada* has a long-term *ROA* relatively low compared to its competitors. Otherwise, the coefficient of adjustment speed of *TD* bank is very low compared to other banks. The attraction exerted by the long-term level of its *ROA* is quite weak with respect to other banks.

We argued previously that the average level of *ROA* observed at *Canadian National Bank* and *Provincial Bank of Canada* in the second half of the seventies was insufficient to maintain these banks in business. In fact, there is a minimum average *ROA* which was *traditionally* the norm for Canadian banks: 0.55%. Table 1 shows that the long-term ratio was higher than this threshold over the period 1988-2003 for all banks. This is not the case for *National Bank* whose long-term *ROA* is equal to 0.52% over this period. It is quite below the average long-term *ROA* of all Canadian banks which is equal to 0.61 over the same period.

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In the second half of the seventies, the *ROA* of both banks were much lower than the threshold rate. *Canadian National Bank* was running to failure while *Provincial Bank of Canada* was a little less weak. This was a major source of concern for the regulating authorities because bank failures are very rare in Canada. These regulating authorities feared that the failure of the two Quebec banks would create chaos in the Canadian financial system. They therefore relied on *moral suasion* to foster the merging of the two banks at the end of the seventies. However, would this merger succeed?

3. The new merged bank

As argued previously, it was *Provincial Bank of Canada* which acquired *Canadian National Bank* in the end of the seventies. Therefore, this was not a "pure" merger. *Canadian National Bank* was in a position of weakness in this merger. It was therefore the former direction of *Provincial Bank of Canada* which takes the lead of the merging process. The executives of the *Canadian National Bank* were fired or downgraded. The old direction of *Provincial Bank of Canada* wanted also to revamp the image of the former banks by hiring "dynamic" employees. However, the new bank inherited the problems of the two old banks. This merging process was somewhat inconsistent. It seemed to be a pure bet. Hence, the first years of the new bank were very difficult. The climate at the new bank was quite depressed. That was not very happy.

A first problem with this merger was that the two banks shared the same weaknesses. They present the same structure of assets and liabilities. Both were very exposed to climbing interest rates. Following the oil crisis at the beginning of the eighties, interest rates skyrocketed and the *ROA* of *National Bank* collapsed and became even negative, a situation even worse than before the merger. This situation was so serious at this time that the new direction reacted by cutting expenses drastically— especially by closing branches by hundreds in Quebec in a very short lapse of time. Cash-flows had to be regenerated at any cost if the bank wanted to survive.

Another problem for the two merging banks was that their activities were mainly concentrated in Quebec. Consequently, diversification effects were not possible for these two banks which were more involved in retail operations than the other Canadian banks. Based in Quebec, they were far away from the Canadian financial center located in Toronto and not in Montreal where the two banks had their head offices. This was a problem when the *National Bank* needed funds because it was not well-known outside the province of Quebec. It only could obtain these funds at a higher risk premium than its competitors.

The provisions for credit losses tended also to be larger at the *National Bank* than for the five largest banks of Canada. They followed the business cycle of the province of Quebec, which is less the case today. When Quebec economic activity slowed down, *National Bank*'s provisions for credit losses[10] increased sensibly. Many commercial and personal failures then occurred. The increase in

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[10] Per $100 of assets.

the provisions was such that it could erase a great part of the revenues of the *National Bank*.

We can judge of the unstable character of the ratio of provision for credit losses of *National Bank* by looking at Figure 5, which reports this ratio from 1988 to 2003. The peaks are associated with major credit events like a writing-down of bad loans granted to less developed countries or losses caused by a major real estate loan. This ratio deteriorated substantially during the recession which took place at the beginning of the nineties and during the economic slowdown observed at the opening of the twenty first century. The countercyclical movement of this ratio is due to the geographic concentration of the retail operations of *National Bank*. This movement is less pronounced for the other banks whose branch networks are better distributed across Canada. For these banks, bad economic conditions in a province can be hedged by better economic conditions in another. For example, if a province suffers from an oil crisis, this may be compensated by banking activities in Alberta—an important producer of black gold. However, an update of Figure 5 over the period 1997-2015 shows that the *National Bank*'s ratio of provisions for credit losses has been lower than the one of all Canadian banks since 2003. Therefore, the balance sheet of *National Bank* seems to embed less credit risk than before.

Figure 5

Ratio of provision for credit losses, National Bank of Canada, 1988-2003

Ratio of provision for credit losses, National Bank of Canada, 1988-2003
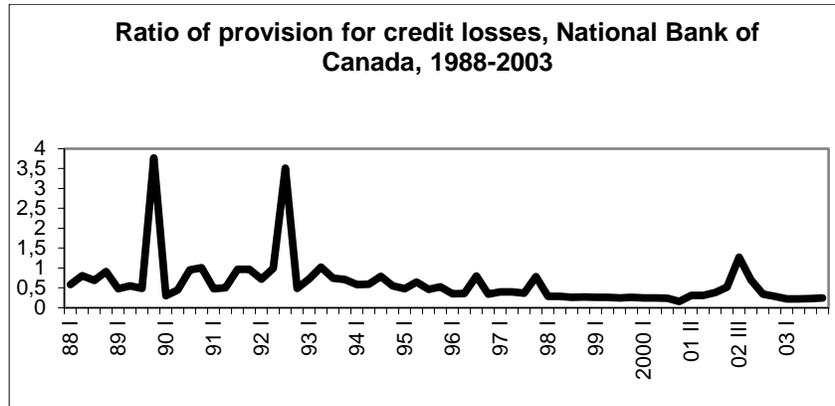
Update: Ratio of provisions for credit losses (PCL), National Bank of Canada and Canadian banks, 1997-2015
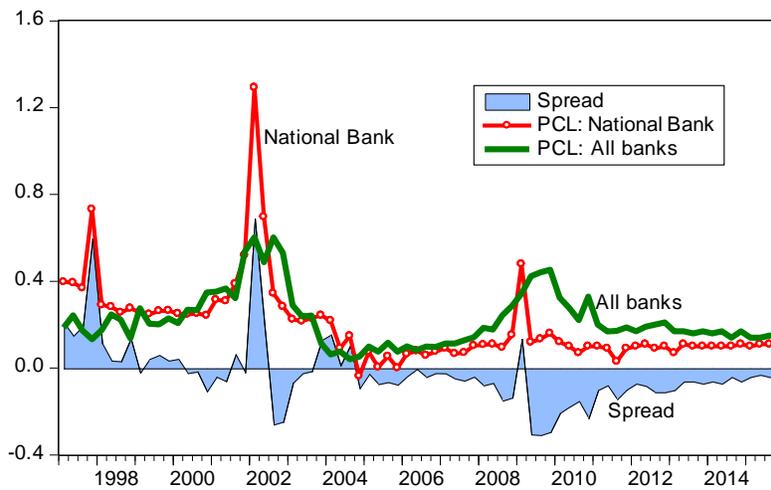
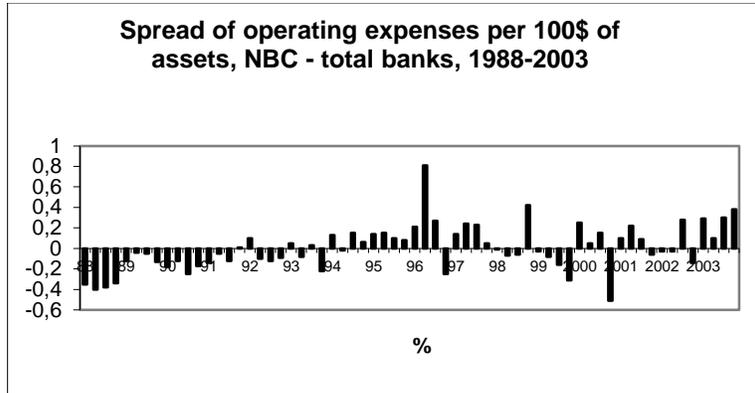*Source:* Canadian Bankers Association.

The new merged bank had also much trouble to control its operating costs (Figure 6) till the advent of the subprime crisis (2007-2009). To understand the spread between the operating expenses per $100 of assets of *National Bank* and all banks, we must realize that *ROA* is lower at the *National Bank* than at the other banks (Table 1). Therefore, *National Bank* tends to have less operating costs per

$100 of assets than its competitors. However, Figure 6 reveals that the spread of the ratios fluctuates greatly and it is often positive over the period 1988-2003—especially at the beginning of the twenty-first century. That was bad for the bank and it signals difficulties to control costs. However, an update[11] of Figure 6 over the period 1997-2015 shows that *National Bank* has a much better control of its non-interest expenses since 2009. The ratio of *National Bank* has remained below the one of all Canadian banks since this year. This is a major improvement for a bank which had difficulties in controlling its non-interest expenses in the past. As shown later, a decrease in the ratio of non-interest expenses was an imperative at the *National Bank* after the subprime crisis since it had to compound with a deterioration of its competitive position regarding its sources of revenues.

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[11] Note that there is a break in the Canadian banks' time series occurring on the first quarter of the fiscal year 2011-2012. Indeed, the OSFI then required that securitized assets—which were previously considered off-balance-sheet assets—be classified as on-balance-sheet components since they were not without risk for banks. In this respect, Brunnermeier (2009) argue that banks continue to bear the risk associated with their loans even though they are securitized—i.e., removed from their balance sheets. However, this regulatory change does not seem to have modified the trend of Canadian banks' time series although there may be some distortion because *National Bank* was more involved in securitization than the "average" Canadian bank.

Figure 6

**Spread between the operating expenses ratio of
National Bank and total banks, 1988-2003**

**Spread of operating expenses per 100$ of
assets, NBC - total banks, 1988-2003**

**Update: Operating expenses ratio of
National Bank and all banks, 1997-2015**
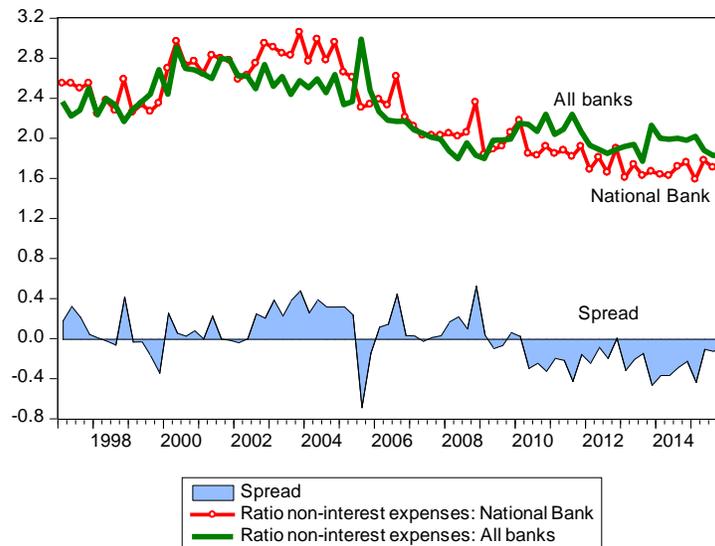
Source: Canadian Bankers Association.

What really saved the bank in the 1980s was its growing implication in
brokerage activities following the acquisition of Lévesque-Beaubien et

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Geoffrion-Leclerc after the revision of the Bank Act in 1987[12]. Following this acquisition, non-interest income skyrocketed as may be seen in Figure 7, which plots the evolution of the spread between the ratios of non-interest income between *National Bank* and all banks. The spread has been most often positive from 1992 and it has increased substantially over the period 2000-2007. The *National Bank* had therefore a competitive advantage on this front. It should be noted that this favorable spread allowed the operating costs of *National Bank* to be more important without too much damaging its financial results. That gave some room of manoeuver to the bank. In fact, there is evidence that the operating costs (per $100 of assets) of the bank co-move positively with its non-interest income. That is quite justifiable.

However, since the subprime crisis, the relative position of *National Bank* has changed markedly. The subprime crisis was very damaging for the bank since it was very involved in the trading of asset-backed commercial paper (ABCP) whose market collapsed during the subprime crisis. Actually, the return on ABCP was quite attractive before the crisis. But, according to an old principle in finance, this return was commensurate to the risk embedded in these instruments, a relationship which was neglected when the ABCP was expanding in Canada. Figure 7 shows that the *National Bank*'s ratio of non-interest income plunged during the collapse of the ABCP market in 2007 and 2008. At the other Canadian banks, the ratio deteriorated less because they were less involved in the trading of ABCP. *Caisse de dépôt et placement du Québec* was also greatly

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[12] Thereafter, *Lévesque-Beaubien et Geoffrion-Leclerc* were merged with First *Marathon Inc.* in September 1999 to become *Financière Banque Nationale*. For the rest of this article, we will refer to *Financière Banque Nationale* to designate the brokerage activities of *National Bank of Canada*.

hit by the collapse of the ABCP market. As shown in Figure 7, *National Bank* has lost its competitive advantage regarding non-interest income since the subprime crisis. Indeed, in contrast to the preceding period, its ratio of non-interest income tends to remain below the one of all Canadian banks. However, for *National Bank* as well as for all banks, this ratio, although lower, is remarkably less volatile than before. In other respects, low interest rates seem to have compressed the net interest margin of Canadian banks.

Figure 7

**Spread between the non-interest income (other income) ratio of
National Bank and all banks, 1988-2003**

Spread of other income per 100$ of assets, NBC -
total banks, 1988-2003
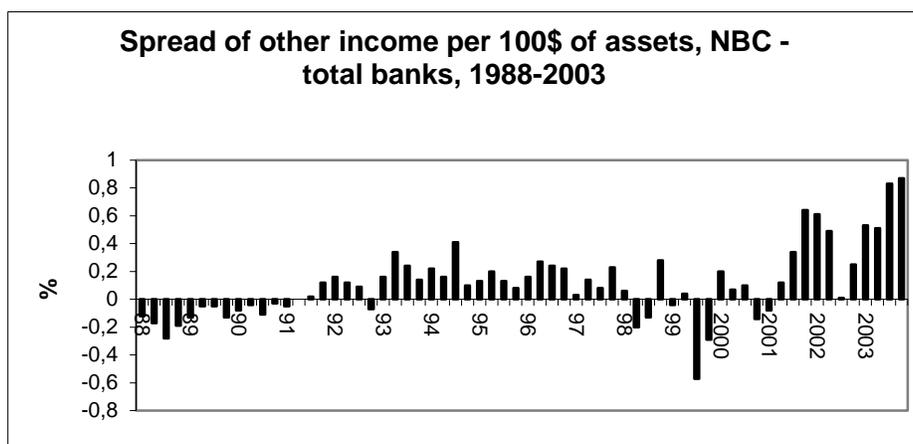
**Update: Non-interest income ratio of
National Bank and all banks, 1997-2015**
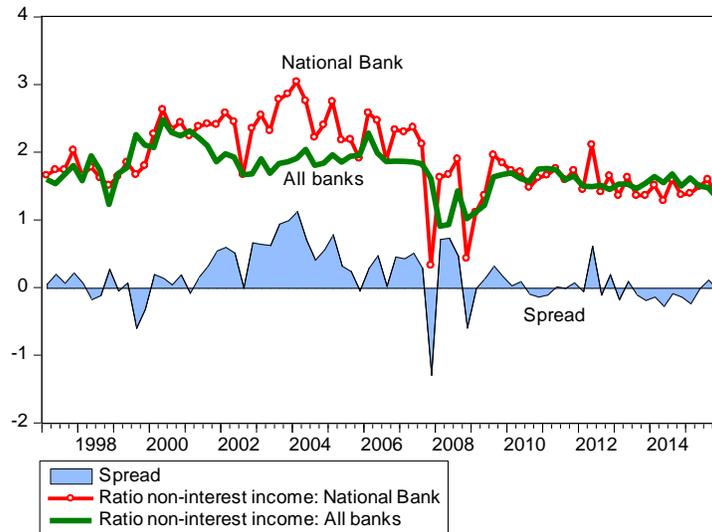
Source: Canadian Bankers Association.

Being *traditionally* more present in retail activities than the other banks, the net interest rate margin of *National Bank*—i.e., the spread between its interest income and interest expenses per $100 of assets—had been usually higher than the one of all Canadian banks till the opening of the second millennium. However, Figure 8 shows that this competitive advantage of the bank has disappeared since 2000. The net interest margin of *National Bank* is much below the one of all Canadian banks since the beginning of the second millennium. *National Bank* focused more on off-balance sheet activities than the other Canadian banks, which has hindered the growth of its traditional sources of revenues. Similarly to the ratio of net interest income, the net interest margin is very stable for both *National Bank* and all *Canadian banks* since 2010. Since that year, short-term interest rates have been close to 0, which seems to have stabilized banks' sources of revenues. However, these low interest rates exert a

downward pressure on Canadian banks' interest margin since banks must compete with the bond and stock markets which offer better returns to depositors "in search of yield". Note that in 1967, the net interest margin of Canadian banks was equal to 2.5% and it only close to 1.5% today.

Figure 8

**Update: Net interest margin of
National Bank and all banks, 1997-2015**
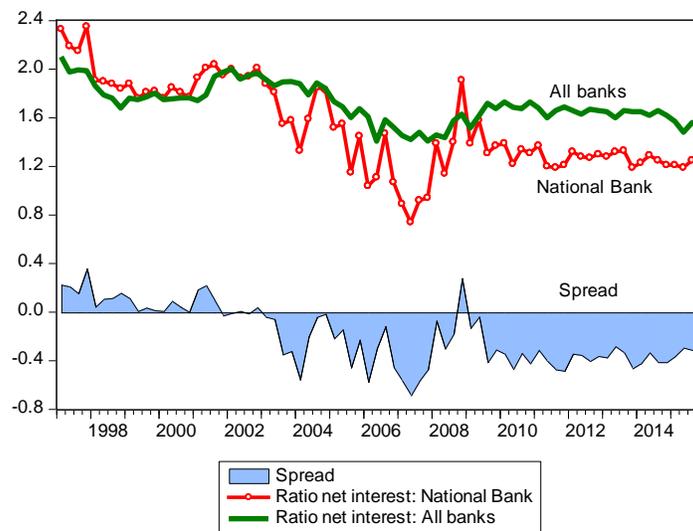
Summarizing, *National Bank* seems to have lost its competitive advantage regarding interest and non-interest income since the beginning of the 2000s. Has this development led to a deterioration of the global competitive advantage of this bank in the Canadian financial system? It is not the case according to Table 1. Over the period 1997-2015, the estimation of the long-term *ROA* of the bank is equal to 0.70%, a rate quite higher than the 0.52% computed over the 1988-2003 period. This ratio is practically equal to the one of all Canadian banks over the same period (0.73%) while it was much inferior over the period 1988-2003.

Despite having been hit by a deterioration of its competitive advantage regarding its sources of income, it now better control its non-interest expenses. This allowed the bank to increase its long-term *ROA*. However, this improvement is also due to a decrease in its ratio of provision for credit losses. All in all, the better financial health of *National Bank* lies on two components of its financial results which can be difficult to control in the long-run.

How to explain the increase in the long-term *ROA* of Canadian banks since 1988? (Table 1). In fact, systemic or holistic risk has increased in the Canadian banking system since the reform of the Canadian *Bank Act* which began in 1987[13]. This reform allowed Canadian banks to get involved in activities such as brokerage, securitization, insurance, investment banking and fiduciary business lines which are associated with universal banking and are riskier than bank traditional activities—i.e., lending and deposit. In fact, a risk premium was added in the Canadian banks' *ROA* to account for the greater risk embedded in the new bank business lines (Calmès and Théoret, 2010). And even if financial innovation which has blossomed over our period of study may have greatly improved bank risk management techniques which in theory should reduce the volatility of financial results, financial innovation seems to be mainly used to bear more calculated risk rather than to protect banks or reduce their global level of risk (Demsetz and Strahan, 1995; Calmès and Théoret, 2016b). According to our estimations, the benchmark (threshold) *ROA*[14] , which was about 0.55% at

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[13] On the rise in systemic risk in the Canadian and U.S. financial systems associated with the development of universal banking, see: Bergevin et al. (2013); Calmès and Théoret (2009, 2010, 2011, 2013a, 2013b, 2014a, 2014b, 2015, 2016a, 2016b); Racicot and Théoret (2016); Théoret (2001).

[14] Which is a long-term rate or a "survival" rate. It is akin to the natural rate of interest of Wicksell.

the time of the "four pillars", is now closer to 0.70% following the addition of the risk premium in the deregulated banking system.

4. A low *P/E* ratio for the *National Bank*'s stock

The low *P/E* (price/earnings) ratio of the stock of *National Bank* which has tended to persist following the merger was decidedly a source of concern for the bank's direction. It was bad for its image. We know that a low *P/E* ratio for a stock can be explained by its risk[15], which was high at the time of the merger of the *National Bank*, but it depends also on poor growth prospects and on a low dividend yield. All this factors were at play to account for the weakness of the *P/E* ratio of the bank. That explains why the price of its stock remained depressed for quite a long time.

The stock of *National Bank* was certainly not a «valeur sûre» in the first years after the merger of the bank. Profits continued to plunge before giving some signs of recovery. The growth prospects were low for the bank because it remained concentrated in Quebec. Its international activities became more important but they were slowed by the increasing risk of the debt of emerging countries. Moreover, the dividend of its stock was cut, which signalled to financial markets that the bank was facing important cash-flows or liquidity problems. Really, a firm usually refrains from cutting its dividend because that

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[15] The financial leverage of the new *National Bank* is greater than the one of its competitors, which tends to increase the beta of the *National Bank*'s stock.

sends a bad signal to the markets and may compromise the recuperation of its stock. That what happened to *National Bank*. And the memory of markets is such that investors remain suspicious after a dividend cut, even if the bank shows signs of strengthening. The recovery of *National Bank*'s stock was thus delayed. The good results of its subsidiary «*Financière Banque Nationale*» revamped its stock. However, its branches network was not a good source of profits. The possession of bricks and mortar was a mortgage for the bank in a virtual financial world.

5. Conclusion

The merger of *National Bank of Canada* was similar to the opening of a lottery. Everything was possible but the chances of success were quite restricted. The structures of two banks were too similar and they were both in bad financial health at the time of the merger. Would the merger of two weak institutions give birth to a strong one? It was allowed to express doubts about this matter.

An investment project like a merger has often real options[16] attached to it but they were difficult to identify in the case of the merger of *Provincial Bank of Canada* and *Canadian National Bank*. Real options increase the *NPV* (net present value) of a project by adding flexibility to it. But it was quite difficult to imagine a growth option at the date of the merger because the two banks had too many branches. Before this merger, there was often a branch of *Provincial Bank*

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[16] On the theory of real options, see: Copeland and Antikarov (2001), Trigeorgis (1996) and Dixit and Pindyck (1994).

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of Canada located in front of a branch of *Canadian National Bank*. There was rather an option of contraction but the question was: is it easier to contract when we are two than when we are one? The answer to this question is not obvious. Hence, it appears that the plain *NPV* of the merger of the two banks was negative and that its augmented *NPV*—i.e., classical *NPV* augmented by the value of real options—was not much higher.

What saved *National Bank* was its acquisitions of Lévesque-Beaubien and Geoffrion-Leclerc at the end of the eighties, which were merged in "*Financière Banque Nationale*" at the end of the nineties. Hence, the reform of the Canadian *Bank Act* in 1987 which authorised, among others, bank brokerage activities was a lifebuoy for *National Bank*. Prosperity came back.

National Bank is now quite profitable since it has succeeded in controlling its non-interest expenses, which have been its weak point over many years. However, it seems to have lost its competitive advantage regarding its net interest margin and its ratio of non-interest income. Its net interest margin is especially low compared to the other Canadian banks. This can be a cause of concern for the bank in the following years.

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Appendix

EViews code to estimate a mean reverting process by the MLE method[17]

rabnc: net income ratio of *National bank of Canada*

```
@logl logl1

res1=rabnc-exp(-c(3))*rabnc(-1)-c(1)*(1-exp(-c(3)))

var=(c(2)/2*c(3))*(1-exp(-2*c(3)))

@param c(2) 0.5 c(3) 3

logl1=log(@dnorm(res1/@sqrt(var)))-log(var)/2
```

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[17] For more details on this estimation, see : Racicot and Théoret (2001) and Racicot and Théoret (2006).

Estimation of the mean-reverting process of the net income ratio of National Bank of Canada by the MLE method

LogL: LOGL02TRIM

Method: Maximum Likelihood (Marquardt)

Date: 06/25/05   Time: 21:26

Sample: 2 64

Included observations: 63

Evaluation order: By observation

Convergence achieved after 102 iterations

	Coefficient	Std. Error	z-Statistic	Prob.
C(3)	3.287950	4.436734	0.741074	0.4586
C(1)	0.130160	0.031761	4.098187	0.0000
C(2)	0.007138	0.010090	0.707501	0.4793

Log likelihood	50.61653	Akaike info criterion	-1.511636
Avg. log likelihood	0.803437	Schwarz criterion	-1.409582
Number of Coefs.	3	Hannan-Quinn criter.	-1.471497