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BANKS' NON-TRADITIONAL ACTIVITIES UNDER REGULATORY CHANGES: IMPACT ON RISK, PERFORMANCE AND CAPITAL ADEQUACY[1]

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ABSTRACT

Using the big six Canadian chartered banks quarterly financial statements and daily stock market data from 1982 to 2018, we examine the impact of non-interest income on Canadian banks' risk, performance and capital under the different major regulatory changes made to the Bank Act of Canada. Our results show that Canadian banks' expansion into non-traditional activities had slightly decreased their risks and significantly improved their performance benefitting from income diversification. Moreover, while adhering to capital adequacy regulation, reshuffling banks' portfolio towards non-traditional activities did not reduce Canadian banks' capital ratio. In spite of the re-regulation towards universal banking against ring-fencing, this feature buttresses the effectiveness of capital adequacy regulation in Canada in linking banks capital allocation with their risk taking.

JEL classification: G21, G28, C33

Keywords: Non-interest income, Banking regulation, Risk exposure, Performance, Capital.

1. INTRODUCTION

Mounting competition from capital markets and shadow banking has widely been identified as one of the major factors that allowed banks to expand in non-traditional activities (bank's business generating non-interest income). For instance, securitization, which is traditionally considered as investment banks business, has transformed some of the interest-earning credit activities into fee-earning and trading activities. Some commentators attribute the rise in non-traditional banking activities, to be one of the driving causes behind the last 2007-2009 "subprime" credit crisis. Therefore, in the backdrop of spiralling financial innovation and increased competition, many proposals advent to restrict activities of too-big-to-fail banks. For example, Basel III increases risk-weights and capital requirements for trading assets and off-balance sheet securitizations, the USA adopts the Volcker rule to restrict some banking activities (e.g., proprietary trading), the UK adopts Vickers proposal for ring-fencing deposits, and so forth. With the ongoing debate in the USA on the reinstatement of Glass–Steagall Act (separation of commercial banks and securities firms), one may suspect on the nature of the dynamics between interest income and non-interest income and its impact on banks behavior. Most recently and forcefully, Saunders et al (2016) call into question the benefits of ring-fencing traditional from non-traditional bank activities.

The purpose of this paper is to study the impact of non-interest income on Canadian banks' risk, performance and capital under different regulatory changes. We consider three major regulatory changes: (i) the 1987 amendment to the Bank Act allowing commercial banks to acquire or merge with investment banks, (ii) the amendment to the Bank Act following Basel I regulation (from 1988 to 1997), and (iii) the amendment to the Bank Act following the 1996 amendment to the Basel I Accord and subsequent amendments in the spirit of the Basel II regulation. Under the Bank Act of 1987, naturally, if commercial banks acquire investment dealers, the portion of their non-traditional revenue should increase since the main activities of brokerage firms are non-interest income activities.[3] Furthermore, economies of scope and scale will enable the acquiring banks to generate more revenues and to diversify.[4] From 1982 to today, non-interest income as share of total revenues has more than doubled in

[3]Traditional activities of commercial banks consist of credit activities generating net interest margin by taking deposits and giving loans. Meanwhile, non-traditional activities draw profits mainly from brokerage, securitization, underwriting, proprietary trading, insurance, and advisory services.

[4] Notwithstanding the diversification discount found by Laeven and Levine (2007) in a cross-countries sample of financial conglomerates engaged in multiple activities.

the Canadian banking.[5] The dramatically increase of non-interest income following the regulatory changes begs closer investigation to provide insights for prudential regulations.

Few studies have addressed the issue of non-traditional activities of Canadian commercial banks in conjunction with their traditional activities following changes in the banking regulations. Among the very few existing papers are Amoako-Adu and Smith (1995) and Calmès and Théoret (2010, 2015), who focus primarily on the impact of increasing non-interest activities (following the 1987 amendment to the Bank Act) on Canadian banks' risk-return tradeoff. For countries other than Canada, studies related to banks' non-interest income focus principally on the diversification and risk effects of non-traditional activities on banks' profitability induced by non-traditional and/or traditional activities (e.g., Smith et al. (2003) and Stiroh (2004, 2006) for American banks; Baele et al. (2007), Jonghe (2010), Lepetit et al. (2008), Mercieca et al. (2007), and Valverde and Fernandez (2007) for European banks; Maudos and Solis (2009) for Mexican banks)). Lin et al. (2012) find evidence that Asian banks by diversifying their income sources can reduce the shocks to net interest margins arising from idiosyncratic risk. Kohler (2015) show that banks in 15 EU countries between 2002 and 2011 were significantly more stable and profitable if they increase their share of non-interest income, indicating that substantial benefits were gained from income diversification.

To the best of our knowledge, no study has addressed the implications of non-traditional activities of commercial banks using an integrated framework (risk, performance and capital) under regulatory changes. Albertazzi and Gambacorta (2009) estimate a set of equations for net 10 industrialized countries in Europe and the United States over the period 1981–2003. However, the focus was to evaluate the effects on banking profitability of shocks to both macroeconomic and financial factors. In addition, the impact of diversification with non-traditional activity on capital adequacy is still debatable in the literature. Furthermore, we use a relatively extensive dataset in a Canadian banking study. We use quarterly financial statements and daily stock market data from 1982 to 2018, which are longer than those in all other Canadian studies. We find evidence of a positive diversification effect of non-traditional activities in the Canadian banking sector: the integration of different financial institutions has slightly decreased risk and significantly improved performance of Canadian banks. Finally, we find that Canadian banks capital ratios were not sensitive to the reshuffling of Canadian

[5] This is not unique to Canada, the same upward trend has been observed in other jurisdictions such as the USA and Europe, e.g., DeYoung and Rice (2004) and Lepetit et al. (2008).

banks' portfolio towards non-traditional activities, which may be explained by the stringent capital constraints on Canadian banks in the form of both risk-sensitive and non-risk-sensitive capital requirements. We can assert that Canadian banks have met the capital adequacy requirements for aggregate traditional and non-traditional activities. This evidence helps us to understand why they have well managed the last subprime credit crisis.

The rest of the paper is structured as follows. Section 2 presents the methodology and describes the variables. Section 3 describes the data and presents the descriptive statistics for the variables. Section 4 presents and discusses the empirical results. We run some robustness checks of our findings in Section 5 and conclude with some policy implications in Section 6.

2. METHODOLOGY AND EMPIRICAL FRAMEWORK

Following Kwan and Eisenbeis (1997) and Altunbas et al. (2007), we formulate a system of three simultaneous equations to study the endogenous impact of banks' non-traditional activities on their risk, performance and capital. The empirical specification stands as follows:

$$X_{j,t} = \beta_0 + \beta_1 X_{j,t-1} + \beta_2 NIM_{j,t} + \beta_3 NII_{j,t} + \delta Z_{j,t} + \gamma I_t + \sum_{j=1}^{n-1} BANK_j + \varepsilon_{j,t}, \quad (1)$$

Where $X_{j,t}$ is a vector of dependent variables comprising: $RISK_{j,t}$ the risk of bank j at time t, $PERF_{j,t}$ the performance measure of bank j at time t, and $CAP_{j,t}$ the capital ratio of bank j at time t. $X_{j,t-1}$ is the lagged dependent variable. The two focal variables $NIM_{j,t}$ and $NII_{j,t}$ are respectively the net interest margin of bank j at time t and the non-interest income of bank j at time t. $Z_{j,t}$ is a vector of bank characteristics and macroeconomic environment control variables, such as the bank size, the liquidity ratio, the assets growth rate, the gross national income growth rate. I_t are dummy indicators used to control for the effects of the bank regulations. $BANK_j$ is a control for specific bank effect and $\varepsilon_{j,t}$ is the error term.

We use the System Generalized Method of Moments (System-GMM) to estimate our parameters (e.g., Blundell and Bond, 1998). We run the simultaneous regressions in equation (1) using a System-GMM that allows dynamic panel estimation. The System-GMM is preferred over First-Differenced-GMM for several reasons. First, the System-GMM approach generally produces more efficient and precise estimates than First-Differenced-GMM by improving precision and reducing the finite sample bias (Baltagi, 2008). Second, our sample is a slightly unbalanced panel as we lack data for some banks in several quarters. With an unbalanced panel it is better to avoid First-Differenced-GMM which has a weakness of

magnifying gaps (Roodman, 2006, p. 19). Third, System-GMM allows including time-invariant variables such as specific regulatory change variables, which will otherwise disappear in First-Differenced-GMM (Sanya and Wolfe, 2011).

2.1. Dependent variables

We define and justify the dependent variables as follows:

- $RISK_{j,t}$, the risk variable is measured by total equity risk (TRISK) and the systemic risk (CoVaR). We calculate TRISK using the standard deviation of daily equity returns over the quarter and then express it on a quarterly basis. CoVaR is the conditional value-at-risk of the financial system, as proposed by Adrian and Brunnemeier (2010).[6] For robustness check, we also use the idiosyncratic risk (IRISK) and the implied assets risk (ARISK).

- $PERF_{j,t}$, the performance measure is captured by the bank's return on assets (ROA) obtained as the ratio of net income over total assets over a quarter. For robustness check, as alternative performance measures, we also use bank's return on equity (ROE) and the Tobin's Q (QTOB) computed as the market value of equity divided by its book value.

- $CAP_{j,t}$ is the ratio of total shareholders' equity over total assets as in Flannery and Rangan (2008). For robustness check, we also use the extended capital ratio CAPE measured by the ratio of shareholders' equity + long-term borrowing + other long-term liabilities over total assets.

2.2. Main independent variables

The other main variables of interest are:

- $NII_{j,t}$ is the non-interest income of bank *j* at time *t*. We measure it by the ratio of the bank's non-interest revenues over its total assets. It is a proxy of non-traditional activities conducted by Canadian banks. We expect such activities to be profitable and therefore, a positive sign of its coefficient relative to the performance ratio. Furthermore, if non-traditional activities diversify Canadian banks risk, we expect a negative and significant coefficient for the risk proxy. Conversely, it will be positive and significant if these activities increase risk. With respect to capital, the expected sign can be either positive or negative, depending on the impact of NII on risk. A significant increase in risk must result in an

[6] There is a growing large literature on bank systemic risk, for an interesting latest survey, see Silva et al. (2017).

additional regulatory capital charge (positive sign), while a decrease can result in a downward adjustment of regulatory capital charge (negative sign).

- $NIM_{j,t}$, net interest margin, represents the performance on bank's lending (traditional) activities and is measured by interest revenues minus interest expenses divided by total assets. It can be either substitute or complement to non-interest income. For instance, DeYoung and Rice (2004) found the two types of revenues to be complements in the American context, while, Lepetit et al. (2008) in the European context, Maudos and Solis (2009) for Mexican banks, and Williams and Rajaguru (2009) for Australian banks, found the two revenues to be substitutes.

2.3. Regulatory dummy variables

I_t is a set of dummy variables capturing the following regulatory changes: (i) the 1987 amendment to the Bank Act [Event 1 also labelled DEC], (ii) the period of the initial Basel I Accords from 1988 to 1997 [Event 2 labelled REG1] and (iii) the period of the 1996 amendment to Basel I Accords and Basel II period since 1998 [Event 3 labelled REG2].

2.4. Control variables

We include some additional control variables in the regressions to reflect banks characteristics and strategic choices, as well as macroeconomic factors that can affect banks' risk, performance and regulatory capital.

- $GNPG_t$ is the growth rate of the gross national product (GNP) in real terms (reference year 2007) at time *t*. We use the GNP instead of the GDP (gross domestic product) because the GNP includes the GDP and other net labor and foreign capital incomes, used to account for international banking activities. We use this variable to capture economic trend or business cycles (e.g., Ayuso et al., 2004; Lindquist, 2004). We expect a negative relationship with risk (i.e., less risk when the economy is doing well), and positive relationship with return and capital (i.e., more profit and more capital buffer in good economic conditions).

- $SIZE_{j,t}$ represents the logarithm of total assets of bank *j* at time *t* and is used to control for the size effect (e.g., Jacques and Nigro, 1997; Rime, 2001; among others). It controls for the fact that larger banks may be inherently more stable particularly since idiosyncratic risk tends to decline with size (Baele et al., 2007). Larger banks may also have better diversification opportunities and thus less income volatility from branching into new markets (Sanya and

Wolfe, 2011). However, as size increases, so does the likelihood of banks be bailed out by government assistance in the event of financial distress (i.e., 'Too-big-To-Fail Paradigm'). From the moral hazard issue likely to occur in larger banks, bigger banks can engage in riskier activities and hold less capital. Thus, the sign of the size coefficient is ambiguous for both risk and capital.

- $LIQUID_{j,t}$ is the liquidity ratio of bank *j* at time *t.* We calculate this as the ratio of cash balance over total assets. Banks with higher cash can readily meet short-term financial obligations without having to untimely sale its investments or fixed assets. On the other hand, cash holding is less profitable, as the interest rates on cash balances are very low. The expected sign of this variable is negative for risk and performance and positive for capital.

- $AGROWTH_{j,t}$ is the assets growth rate of bank *j* at time *t.* We compute it as the percentage change in assets value from the previous quarter. We expect this variable to be positive in the risk equation as rapid assets growth may increase banks' portfolio risk. However, its sign is undetermined in advance for performance and capital ratio. Indeed, even if risky, new assets can turn out to be more profitable and help banks increase their capital buffer, the reverse is also likely to happen.

- $LLPROV_{j,t}$ is the ratio of loan loss provision over total loans of bank *j* at time *t.* It is a proxy of credit risk. We anticipate a positive relationship between LLPROV and risk or capital, and a negative association with the performance.

3. DATA AND DESCRIPTIVE STATISTICS

Our sample is composed of the big six Canadian chartered banks. These six banks are the ones being identified by the Canadian regulatory authority as systematically important financial institutions, and therefore, need much closer regulatory and public scrutiny. As of July 31st 2018 (end on the third quarter), the Canadian banking sector had $ 5 311 billion of assets under management. The big six banks represent approximately 90% of the total assets of the Canadian banking sector in general and 75% of the assets of the deposit institutions sector in particular.

We calculated banks specific variables using data extracted from Bloomberg and supplemented by data collected manually from various banks' annual reports. For Canadian economic variables, we obtain the data from Statistics Canada and the Bank of Canada. The

sample is composed of quarterly financial statements and daily market observations from 1982 to 2018.

Table 1 presents the definition and descriptive statistics (number of observations, means, standard deviations, minimum and maximum) of the variables. The number of observations used is relatively substantial in Canadian banking study, more than 850 quarterly book observations.[7] Per quarter, we observe an average total risk (TRISK) of 10.63% (standard deviation of 5.51%), systemic risk (CoVar) of 1.1% (standard deviation of 5%), implicit assets volatility (ARISK) of 0.76% (standard deviation of 0.56%), idiosyncratic risk (IRISK) of 9.99% (standard deviation of 4.86%). Moreover, the quarterly average return on assets (ROA) is 0.19% between 1982 and 2018 for the six banks with a standard deviation of 0.16%. The quarterly average return on equity (ROE) is 4.08% with a standard deviation of 4.38%, while the Tobin Q (QTOB) is about 1.38 for the same period with a standard deviation of 0.48. Regarding the capital ratio, we find an average capital ratio (CAP) over the quarter of 4.98% between 1982 and 2018 for the six banks with a standard deviation of 0.8% and an average extended capital ratio (CAPE) of 14.24% for the same period with a standard deviation of 4.81%. The quarterly average NIM and NII are respectively, 0.51% and 0.35%, with standard deviations of 0.15% and 0.13% respectively.

INSERT TABLE 1 HERE.

Table 2 presents the pairwise correlations between the variables. The correlations between the risk proxies are relatively high: 94.77% between total risk (TRISK) and idiosyncratic risk (IRISK); 70.76% between total risk (TRISK) and systemic risk (CoVaR); 75.72% between total risk (TRISK) and asset risk (ARISK) and 72.56% between asset risk (ARISK) and idiosyncratic risk (IRISK). It is less pronounced between CoVar and IRISK (67.89%), and between CoVaR and ARISK (60.77%). The net interest margin (NIM) and the revenues from non-traditional activities (NII) are negatively correlated (-47.30%). The capital ratio (CAP) is negatively correlated with NIM (-1.11%) and positively correlated with non-interest income NII (17.00%). NIM is negatively correlated with TRISK (-1.6%), IRISK (-1.4%), CoVaR (-5.2%) and ARISK (-28.5%), while NII is positively correlated with TRISK (2.6%), IRISK (3.6%), CoVaR (1.9%) and ARISK (20.10%).

[7] Shaffer (1993), who tested the competition among Canadian banks, uses only annual data between 1965 and 1989, i.e., only 24 observations. Nathan and Neave (1989) use 39 observations, D'Souza and Lai (2003) use 125 quarterly observations, Gueyie and Lai (2003) use 115 annual observations, Calmès and Théorêt (2015) on aggregate more than 100 observations and in the best case, we have Allen and Liu (2007) with 480 quarterly observations.

INSERT TABLE 2 HERE.

4. EMPIRICAL RESULTS AND DISCUSSIONS

Below we present our empirical results and discuss the findings.

4.1. Impact of non-traditional activities on banks' risk exposure

To answer this research question, we run the system of simultaneous equation (1), which accounts for the possible endogeneity between risk, performance and capital. In the regression equations, the general impact of non-traditional activities on banks' risk is captured by the coefficient of NII, while the regulatory dummy represented by either DEC, REG1 or REG2 captures the impact of regulatory changes. The regressions results are reported in Tables 3 and 4 with total risk (TRISK) used as risk measure.

INSERT TABLES 3 AND 4 HERE.

From columns 1, 4 and 7 of Table 3 we observe that the coefficient of NII is generally negative for TRISK, but not significant in the three columns. Regarding the regulatory changes, the coefficients of DEC and REG2 are also positive and significant at 5% levels for REG2. Clearly, Table 3 seems to suggest that Canadian banks expansion in non-traditional activities has had no significant impact on their total risk. Table 4 further estimates regressions using only data within each regulatory period. NII coefficients still all negative, and significant at 10% and 5% levels respectively, in DEC and REG2 subperiods. Combining the two tables' results, we then conclude in no effect to a marginal diversification effect of Canadian banks expansion in non-traditional activities on their risk.[8] This result complements the one of Amoako-Adu and Smith (1995) who found that the 1987 amendment to the Bank Act had no significant impact on Canadian banks' systematic risk. It is in line with the findings in other jurisdictions, e.g., Smith et al. (2003) in the American case, Lepetit et al. (2008) for European banks and Sanya and Wolfe (2011) for other international studies, who found a decreasing impact of non-interest income on risk. In Tables 3 and 4, NIM is also negatively related to total risk and significant at 1 percent level for the regulatory subperiod 1 in Table 4. The negative coefficients of NII and NIM marginally support the diversification

[8]As defined here, REG2 (which is equal to one for 1998-2018 and zero otherwise) spans a relatively long period. We have split it into 3 different sub-periods namely Short REG2 –SREG2 (1998-2006); SUBPRIME (2007-2009) and POST-SUBPRIME (2010-2018). Results are unchanged in a regression including the 3 variables. The coefficients of NII and NIM are still non-significantly different from zero. SUBPRIME is positive and significant, while SREG2 and POST-SUBPRIME are not significant.

argument through the substitution effect between NII and NIM, which reduces the total risk of the bank.

The other control variables have more or less the expected signs. For instance, the coefficient of the first lag of TRISK is generally positive and significant at 1% level, suggesting a dynamic nature of banks' risk decisions. GNPG is negatively and significantly related to the total risk measure. This corroborates Shim (2012) result who found for a US sample, a negative and significant relationship between the change in risk and economic cycle, approximated by the GNP rate of growth. This means that banks' risk is related to business cycle in an anti-cyclical manner. Specifically, as an expansionary phase of the economy is associated with relatively lower non-performing loans ratio, so do total risk.

LIQUID is generally non-significant, while AGROWTH is positive, and significant for all TRISK equation in Table 3. Rapid assets growth tends to increase Canadian banks' portfolio risk. Credit risk approximated by LLPROV contributes positively to total risk increase. It is significant at at least at 5 % level in all TRISK equations.

In Tables 5 and 6, systemic risk (CoVaR) is used as risk measure. The results are materially unchanged, except the fact that LLPROV is no significant in all but one case.

INSERT TABLES 5 AND 6 HERE.

In sum, expansion of Canadian banks in non-traditional activities has resulted in a marginal reduction of their total risk. This stems from the diversification benefit from these non-interest income activities due to the substitution effect between non-traditional and traditional activities that takes place following the amendment to the Bank Act in 1987 which allowed banks to acquire or merge with investment dealers and brokerage firms.

4.2.Impact of non-traditional activities on banks' capital level

Having studied the impact of the increase of non-traditional activities on Canadian banks' risk exposure, we address our next research question which is the impact of these non-traditional activities on Canadian banks' capital ratio. Indeed, capital regulations such as Basel Accords are intended to force banks to hold capital charges against their risk exposures (credit, market, operational and other risk). Between 1988 and 1997 (period before the major amendment to the Basel I Accords was in effect), capital risk charges were associated to credit risk, in other words, to interest income activities such as debts, loans and credit derivatives. Therefore, all else being equal, we might expect banks to increase their non-

interest income activities requiring less capital charges during that period. However, after the 1996 amendment to the Basel I Accords and Basel II, this trend may change since in 1998 market risk has been introduced as a new risk category and later Basel II requires capital charges against operational risk.

To analyse the possible impact of this increasing trend in non-traditional activities on Canadian banks' capital, we introduce NII, as well as DEC, REG1 and REG2 in the regression equation where CAPis used as dependent variable. The results of the regressions presented in columns 3, 6 and 9 of Tables 3 and 4, show that increases in non-interest income have no significant impact on Canadian banks' capital ratio in general. The explanation lies in the fact that, in the 90s, Canadian regulators not only maintained the minimum regulatory capital requirement, but also reduced the leverage ratio limit.[9] Indeed, Canada's banking authority capped the asset-to-capital multiple at 30 from 1982 to 1991. Late in 1991, the authority decreased this balance sheet leverage ratio limit to 20, where it remained until 2000, when it rose to 23 under certain conditions. This leverage ratio requirement has been shown to mitigate asymmetric information and agency problems (e.g., Blum, 2008), and some claim that it contributed to Canada's banking sector resilience in the recent credit turmoil (e.g., Bordeleau et al., 2009 and Dickson, 2009). Furthermore, after 2000, Canada increased the minimum regulatory capital-to-RWA ratio from 8% to 10%. These regulatory changes increased the level of capital in Canada's banking sector after 1998, since one would have expected the capital ratio to decrease or remain more or less the same after the introduction of market risk as a new risk category. These exogenous changes in Canadian banks capital level imposed by the Canadian regulator may explain the non-significant impact of NII on CAP. Here also the control variables have more or less the expected signs. SIZE, LIQUID and LLPROV are generally non-significant, while AGROWTH and GNPG have negative impact on capital.

In Tables 5 and 6 systemic risk (CoVaR) is used as risk measure. The results are materially unchanged.

From the evidence we gathered, Canadian banks have met the capital adequacy requirements for aggregate traditional and non-traditional activities. This evidence helps us to understand why they have well managed the last subprime credit crisis.

[9]See Guidara et al. (2013) for further details.

4.3. Impact of non-traditional activities on banks' performance

To address our last research question, we next analyse the impact of the increasing trend in non-interest income activities on Canadian banks' performance measured by the return on assets (ROA). We present the results with ROA in columns 2, 5 and 8 of Table 3 and Table 4.[10]

We find that increases in non-traditional activities have had a positive impact on banks' profitability. The coefficient of NII is positive and significant both for the full period than for the subperiods only. Hence, expansion in non-traditional activities has increased the performance of Canadian banks. These results corroborate those previously found in the literature. For instance, Rogers (1998) found that efficiency estimation which omits non-traditional output understates bank efficiency. The contribution of traditional activities, captured by NIM, to profitability is also positive and significant. Again marginally diversifying their activities into non-traditional activities has positive return benefit for Canadian banks. Here also the other control variables have more or less the expected signs for their coefficients. For instance, as expected, loans loss provision (LLPROV) has a strong negative impact on banks' performance.

In Tables 5 and 6 systemic risk (CoVaR) is used as risk measure. The results are materially unchanged.

Combining performance and risk results, Canadian banks expansion into non-traditional activities has resulted into a steady increase in performance, with no impact to a slight decrease in their performance. This provides an evidence of a diversification effect of these non-traditional activities.

5. Robustness checks

For robustness checks, we re-ran the above regressions with different risk measures, namely the idiosyncratic risk (IRISK) and the implicit assets volatility risk (ARISK) obtained using Ronn and Verma (1986) approach. Due to space limitations, the calculation of these risks measures and the regression results are reported in the supplementary online material.

[10]A fourth question which is "what type of relationship exists between non-interest income and interest income activities (substitutes or complements)?'' is addressed in the supplementary online material.

The results are unchanged relative to what have been found in Table 3 and Table 4. NII and NIM are generally not significantly associated to IRISK and ARISK in Tables A3, A4, A5 and A6. Overall, the results obtained with these alternative risk measures support our previous finding, i.e., a marginally reducing effect of non interest activities on Canadian banks' risk.

We also run additional robustness analyses using different performance measures, such as ROE and Tobin's Q (QTOB), and different capital ratio measures: extended capital ratio (CAPE). The unreported results available upon request from the authors confirm our findings.

6. Conclusion

The main purpose of this study was to test the impact of non-traditional activities of Canadian banks on their risk, performance and capital adequacy under different regulatory changes. We use a sample of quarterly financial statements and daily stock market observations of the six big Canadian chartered banks from 1982 to 2018. We use the System-GMM approach for our estimations. Three regulatory regimes are considered: (1) the 1987 amendment to the Bank Act which allowed Canadian banks to enter investment banking activities; (2) the Basel I regulation period from 1988 to 1997, and (3) the 1996 amendment of Basel I and Basel II regulation period, i.e. 1998-2018, which introduce, respectively, market risk and operational risk as distinct categories of risks in the calculation of the risk-weighted-assets.

We found that the 1987 amendment to the Bank Act, with decompartmentalization, allowing banks to acquire investment banks, contributes to increase the share of non-interest income in the total revenue structure of Canadian banks. Over the study period, we found non-interest income and net interest income to be substitutes. We also found that increases in non-interest activities had a marginally significant reducing effect on Canadian banks' risk exposure and positive impact on their performance; however, it had no significant impact on Canadian banks' capital ratio. The marginally negative impact of non-traditional activities on risk and positive effect on returns stem from the benefits from diversification following the increase in non-interest income activities in Canadian banks' portfolio. Moreover, the reshuffling of Canadian banks' portfolio towards non-traditional activities did not reduce their capital ratio, which tends to support the effectiveness of capital adequacy regulation in Canada in linking banks' capital and risk in spite of the permissive trend towards not ring-fencing with universal banking. This tends to suggest that a successful merging of commercial

banks with investment dealers and brokerage firms should pass through effective capital adequacy. In addition, we give support to the effectiveness of joining risk-sensitive and non-risk-sensitive capital measures in a capital adequacy framework as suggested by the current Basel III regulation.

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Table 1: Descriptive statistics of the variables

Data are from 1982 (Q1) to 2018 (Q3). Financial statement variables are quarterly observations. Market variables are daily observations converted to quarters.

VARIABLES	DESCRIPTION	OBS	MEAN	STD. DEV.	MIN	MAX
TRISK	Total risk = Standard deviation of daily equity returns over the last quarter	857	0.106	0.055	0.034	0.484
COVAR	Systemic risk = Conditional value-at-risk of the Canadian banking system	857	0.011	0.058	-0.092	0.363
IRISK	Idiosyncratic risk (*)	851	0.100	0.048	0.033	0.348
ARISK	Implicit volatility of assets computed using Ronn and Verma (1986) approach	857	0.007	0.006	0.001	0.053
NIM	Ratio of net interest margin = (Interest income – Interest expenses) / Total assets	857	0.005	0.002	-0.002	0.009
NII	Ratio of non-interest income = Non-interest income / Total assets	857	0.003	0.001	-0.004	0.008
ROA	Return on assets = Net income / Total assets	857	0.002	0.001	-0.007	0.013
ROE	Return on equity = Net income / Total shareholder's equity	857	0.041	0.044	-0.154	0.384
QTOB	Market value of equity / Book value of equity	857	1.386	0.483	0.391	2.821
CAP	Book capital ratio = Total shareholder's equity / Total assets	857	0.050	0.008	0.026	0.073
CAPE	Total shareholder's equity + LT borrowing + other LT Liabilities / Total assets	857	0.142	0.048	0.054	0.289
GNPG	Growth rate of the Gross National Product (GNP)	857	0.025	0.026	-0.087	0.088
LIQUID	Liquidity ratio = Cash balance / Total assets	857	0.013	0.016	0.002	0.114
SIZE	Logarithm of the total assets of the bank	857	12.182	0.974	9.785	14,065
AGROWTH	Assets growth rate = Percentage change in total assets value over the last quarter	857	0.019	0.041	-0.216	0.260
LLPROV	Loan loss provision ratio = Total loan loss provision / Total loan	857	0.001	0.001	-0.002	0.009
DEC	Dummy variable (**)	857	0.845	0.362	0.000	1.000
REG1	Dummy variable taken value 1 over the period 1988-1997 and 0 elsewhere	857	0.284	0.451	0.000	1.000
REG2	Dummy variable taken value 1 over the period 1998-2018 and 0 elsewhere	857	0.575	0.494	0.000	1.000

(*) Idiosyncratic risk = Conditional variance estimated by a GARCH-M (1,1) of errors in a multifactor model.
(**) Dummy variable taken value of 1 after the effective date of the first acquisition of a brokerage or dealer firm by the bank, and 0 otherwise

Table 2: Pairwise correlations between variables

Pairwise correlations higher than 20% in absolute value are highlighted in bold.

	TRISK	IRISK	CoVaR	ARISK	NIM	NII	ROA	ROE
TRISK	1.000							
IRISK	**0.9477**	1.000						
COVAR	**0.7067**	**0.6789**	1.000					
ARISK	**0.7572**	**07256**	**0.6077**	1.000				
NIM	-0.016	-0.014	-0.052	**-0.285**	1.000			
NII	0.026	0.036	0.019	0.201	**-0.473**	1.000		
ROA	-0.094	-0.126	-0.024	0.131	0.111	-0.012	1.000	
ROE	-0.064	-0.010	0.000	-0.147	0.137	-0.059	**0.978**	1.000
QTOB	-0.131	-0119	0.007	**0.291**	**-0.646**	**0.441**	-0.100	-0148
CAP	-0.142	-0.149	-0.130	0.082	-0.111	0.170	-0.062	**-0.224**
CAPE	0.176	0.164	0.191	**0.285**	**-0.257**	**0.300**	-0.153	-0.177
GNPG	-0.149	-0.119	-0.131	-0.154	0.053	0.008	0.136	0.158
LIQUID	-0.108	-0.114	-0.089	-0.143	**-**0.021	-0.154	0.033	-0.031
SIZE	-0.125	-0.145	0.184	0.229	**-0.7147**	**0.301**	-0.004	-0.115
AGROWTH	-0.012	-0.021	-0.042	-0.017	-0.047	0.001	-0.058	-0.056
LLPROV	0.111	0.101	0.042	-0.094	**-0.45**	-0.171	-0.155	-0.080

	QTOB	CAP	CAPE	GNPG	LIQUID	SIZE	AGROWTH	LLPROV
QTOB	1.000							
CAP	0.125	1.000						
CAPE	0.245	0.137	1.000					
GNPG	-0.006	-0.198	-0.109	1.000				
LIQUIQ	-0.177	0.052	0.055	0.021	1.000			
SIZE	**0.667**	**0.403**	0.264	-0.145	0.037	1.000		
AGROWTH	-0.059	-0.045	0.045	0.025	0.033	0.032	1.000	
LLPROV	**-0.421**	-0.131	-0.096	-0.063	-0.019	**-0.388**	-0.04	1.000

Table 3: Estimation results of the impact of non-interest income and regulatory changes on risk, performance and capital

This table presents the estimation results for the system of simultaneous equations (1, 2 and 3) of TRISK, ROA and CAP using the System-GMM. We use quarterly available financial statements and daily market data from 1982 to 2018. The dependent variables are: the total risk (TRISK), the return on assets (ROA) and the bank's capital ratio (CAP). Event 1 tests the impact of the 1987 amendment to the Bank Act, event 2 tests the impact of the amendment to the Bank Act following Basel I, and event 3 tests the impact of the amendment to the Bank Act following the 1996 amendment to Basel I and Basel II. Event 1 is shown by regressions (1), (2) and (3), Event 2 by (4), (5) and (6) and Event 3 by (7), (8) and (9). Corresponding dummy variables for these events are DEC, REG1 and REG2 respectively. The standard deviation of coefficients is given in parentheses. The signs ***, ** and * represent, respectively, significance levels at 1%, 5% and 10%.

VARIABLES	(1) TRISK	(2) ROA	(3) CAP	(4) TRISK	(5) ROA	(6) CAP	(7) TRISK	(8) ROA	(9) CAP
Constant	0.013***	-0.001*	0.007**	0.013***	-0.002	-0.006**	0.010***	-0.001	0.007***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
$TRISK_{j,t-1}$	0.620***			0.621***			0.618***		
	(0.02)			(0.02)			(0.02)		
$ROA_{j,t-1}$		0.744***			0.748***			0.782***	
		(0.06)			(0.06)			(0.08)	
$CAP_{j,t-1}$			0.878***			0.883***			0.880***
			(0.03)			(0.02)			(0.02)
$NII_{j,t}$	-0.402	0.273***	0.028	-0.245	0.226***	0.061	-0.284	0.166**	0.058
	(0.20)	(0.06)	(0.11)	(0.17)	(0.06)	(0.10)	(0.17)	(0.04)	(0.09)
$NIM_{j,t}$	-0.400	0.218***	-0.050	-0.463	0.429*	-0.036	-0.094	0.208***	-0.094
	(0.21)	(0.05)	(0.14)	(0.40)	(0.19)	(0.15)	(0.24)	(0.05)	(1.26)
$CAP_{j,t}$	-0.122***			-0.098			-0.094**		
	(0.05)			(0.05)			(0.04)		
$TRISK_{j,t}$		0.005	0.015		0.001	0.016		0.003	0.016
		(0.00)	(0.01)		(0.00)	(0.01)		(0.00)	(0.01)
DEC_t	0.001	-0.001*	0.000						
	(0.00)	(0.00)	(0.00)						

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Table 3 (Continued)

VARIABLES	TRISK	ROA	CAP	TRISK	ROA	CAP	TRISK	ROA	CAP
$REG1_t$				-0.000	-0.001	-0.000			
				(0.00)	(0.00)	(0.00)			
$REG2_t$							0.001**	-0.000	-0.000
							(0.00)	(0.00)	(0.00)
$GNPG_t$	-0.017**	0.001	-0.010**	-0.020**	0.002	-0.010**	-0.020***	0.003	-0.010
	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
$SIZE_{j,t}$	-0.001	0.000	0.000	-0.001	0.000	0.000	-0.001	0.000	0.000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
$LIQUID_{j,t}$	-0.044	0.004	0.007	-0.045	0.007	0.008	-0.037	0.004	0.006
	(0.03)	(0.00)	(0.01)	(0.02)	(0.01)	(0.00)	(0.02)	(0.00)	(0.01)
$AGROWTH_{j,t}$	0.016**	-0.002	-0.036***	0.019**	-0.001*	-0.035***	0.021**	-0.004	-0.036***
	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)
$LLPROV_{j,t}$	0.795***	-0.489***	0.039	0.857**	-0.499**	0.032	0.822**	-0.482***	0.045
	(0.17)	(0.07)	(0.27)	(0.25)	(0.07)	(0.26)	(0.20)	(0.08)	(0.24)
Observations	846	846	846	846	846	846	846	846	846
Number of banks	6	6	6	6	6	6	6	6	6
F-Statistic	31.41	904.84	305.68	129.37	946.41	109.51	166.97	378.14	309.60
P-value of F stat.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hansen	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
P-value Hansen	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AR2	0.98	1.82	1.27	0.92	1.84	1.28	0.93	1.89	1.27
P-value of AR2	0.33	0.07	0.21	0.36	0.07	0.20	0.35	0.06	0.24
Sargan statistic	636.04	546.17	374.64	635.66	551.79	373.21	638.12	524.34	374.17
P-value Sargan	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bank fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 4: Estimation results of the impact of non-interest income and regulatory changes on risk, performance and capital over the regulatory subperiods

This table presents the estimation results for the system of simultaneous equations (1, 2 and 3) of TRISK, ROA and CAP using the System-GMM. We use quarterly available financial statements and daily market data from 1982 to 2018. The dependent variables are: the total risk (TRISK), the return on assets (ROA) and the bank's capital ratio (CAP). Estimations are performed using only data within each regulatory period, namely DEC from 1987 to 2018 to account for the 1987 amendment to the Bank Act; REG1 from 1988 to 1997 to account for the amendment to the Bank Act following Basel I; and REG2 from 1998 to 2018 to account for the amendment to the Bank Act following the 1996 amendment to Basel I and Basel II. The standard deviation of coefficients is given in parentheses. The signs ***, ** and * represent respectively significance levels at 1%, 5% and 10%.

	DEC subperiod only			REG1 subperiod only			REG2 subperiod only		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	TRISK	ROA	CAP	TRISK	ROA	CAP	TRISK	ROA	CAP
Constant	0.019**	0.000	0.007	0.017***	-0.002*	0.004	0.015**	0.001	0.008**
	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
$TRISK_{j,t-1}$	0.629***			0.309**			0.493***		
	(0.02)			(0.08)			(0.06)		
$ROA_{j,t-1}$		0.060			0.069**			0.151**	
		(0.05)			(0.02)			(0.05)	
$CAP_{j,t-1}$			0.887***			0.821***			0.895***
			(0.03)			(0.02)			(0.04)
$NII_{j,t}$	-0.544*	0182***	0.029	-0.704	0.169*	0.371	-0.664**	0.305***	0.095
	(0.25)	(0.06)	(0.14)	(0.55)	(0.08)	(0.42)	(0.26)	(0.08)	(0.14)
$NIM_{j,t}$	-0.817	0.338**	-0.143	-1.655***	0.546**	0.594	-0.091	-0.066	-0.612*
	(0.67)	(0.13)	(0.19)	(0.41)	(0.15)	(0.58)	(0.63)	(0.11)	(0.28)
$CAP_{j,t}$	-0.188**			0.086*			-1.592*		
	(0.06)			(0.03)			(0.08)		
$TRISK_{j,t}$		-0.010*	0.012		-0.004	0.083*		0.000	0.032
		(0.00)	(0.01)		(0.01)	(0.04)		(0.00)	(0.03)

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Table 4 (Continued)

VARIABLES	TRISK	ROA	CAP	TRISK	ROA	CAP	TRISK	ROA	CAP
$GNPG_t$	-0.021**	-0.001	-0.011**	-0.011	0.004	-0.004	-0.046**	0.001	-0.009***
	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)
$SIZE_{j,t}$	-0.001	0.000*	0.000	-0.001**	-0.001	0.001	-0.002	0.000*	0.001*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
$LIQUID_{j,t}$	-0.003	0.001	0.010	-0.015	-0.001	0.003	-0.044	0.000	0.007
	(0.03)	(0.00)	(0.01)	(0.02)	(0.00)	(0.02)	(0.04)	(0.01)	(0.01)
$AGROWTH_{j,t}$	0.010	-0.001	-0.041***	0.015	-0.002	-0.037***	0.017*	-0.001	-0.042***
	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)
$LLPROV_{j,t}$	1.003**	-0.656***	0.155	0.577***	-0.746***	-0.004	5.989***	-0.713***	-0.310
	(0.27)	(0.08)	(0.37)	(0.13)	(0.11)	(0.35)	(1.48)	(0.12)	(0.56)
Observations	714	714	714	234	234	234	492	492	492
Number of banks	6	6	6	6	6	6	6	6	6
F-Statistic	9.92	264.23	280.97	7.25	75.97	443.36	136.83	194.94	91.16
P-value of F stat.	0.01	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00
Hansen	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
P-value Hansen	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AR2	0.41	0.35	1.23	0.30	1.18	1.04	1.85	0.48	1.11
P-value of AR2	0.68	0.73	0.22	0.77	0.24	0.30	0.06	0.63	0.27
Sargan statistic	546.67	436.32	278.42	177.09	147.95	107.44	389.66	278.84	180.87
P-value Sargan	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.07
Bank fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 5: Estimation results of the impact of non-interest income and regulatory changes on risk, performance and capital

This table presents the estimation results for the system of simultaneous equations (1, 2 and 3) of COVAR, ROA and CAP using the System-GMM. We use quarterly available financial statements and daily market data from 1982 to 2018. The dependent variables are: the systemic risk (COVAR), the return on assets (ROA) and the bank's capital ratio (CAP). Event 1 tests the impact of the 1987 amendment to the Bank Act, event 2 tests the impact of the amendment to the Bank Act following Basel I, and event 3 tests the impact of the amendment to the Bank Act following the 1996 amendment to Basel I and Basel II. Event 1 is shown by regressions (1), (2) and (3), Event 2 by (4), (5) and (6) and Event 3 by (7), (8) and (9). Corresponding dummy variables for these events are DEC, REG1 and REG2 respectively. The standard deviation of coefficients is given in parentheses. The signs ***, ** and * represent, respectively, significance levels at 1%, 5% and 10%.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	COVAR	ROA	CAP	COVAR	ROA	CAP	COVAR	ROA	CAP
Constant	0.099**	-0.005**	0.007**	0.096***	-0.002	0.007**	0.080**	0.000	0.007***
	(0.03)	(0.00)	(0.00)	(0.03)	(0.00)	(0.00)	(0.03)	(0.00)	(0.00)
$COVAR_{j,t-1}$	0.562***			0.557***			0.553***		
	(0.04)			(0.03)			(0.04)		
$ROA_{j,t-1}$		0.743***			0.748***			0.781***	
		(0.06)			(0.06)			(0.08)	
$CAP_{j,t-1}$			0.873***			0.878***			0.8780***
			(0.03)			(0.02)			(0.02)
$NII_{j,t}$	-0.972	0.273***	0.022	0.263	0.226***	0.059	-0.780	0.165**	0.056
	(1.05)	(0.06)	(0.11)	(1.20)	(0.06)	(0.10)	(0.92)	(0.04)	(0.09)
$NIM_{j,t}$	-1.909	0.218***	-0.066	-0.800	0.429*	-0.055	1.039	0.208*	-00.86
	(2.24)	(0.05)	(0.14)	(1.23)	(0.19)	(0.15)	(1.47)	(0.04)	(0.12)
$CAP_{j,t}$	-1.772**			-1.710**			-1.737**		
	(0.04)			(0.46)			(0.50)		
$COVAR_{j,t}$		0.006	0.005		0.000	0.000		0.006	0.016
		(0.00)	(0.01)		(0.00)	(0.01)		(0.00)	(0.01)
DEC_t	0.001*	-0.001**	0.000						
	(0.00)	(0.00)	(0.00)						

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Table 5 (Continued)

VARIABLES	COVAR	ROA	CAP	COVAR	ROA	CAP	COVAR	ROA	CAP
$REG1_t$				-0.009**	-0.000	-0.000			
				(0.00)	(0.00)	(0.00)			
$REG2_t$							0.016	-0.000	-0.000
							(0.01)	(0.00)	(0.00)
$GNPG_t$	-0.196***	0.009	-0.010**	-0.213***	0.001	-0.011**	-0.208***	0.003	-0.011**
	(0.04)	(0.00)	(0.00)	(0.05)	(0.00)	(0.00)	(0.04)	(0.00)	(0.00)
$SIZE_{j,t}$	0.009	0.000	0.000	0.010	0.000	0.000	0.008	0.000	0.000
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)
$LIQUID_{j,t}$	-0.010	0.004	0.006	0.035	0.007	0.006	0.069	0.004	0.006
	(0.16)	(0.00)	(0.01)	(0.20)	(0.01)	(0.00)	(0.02)	(0.00)	(0.01)
$AGROWTH_{j,t}$	0.021	-0.002	-0.036***	0.023	-0.001**	-0.035***	0.030	-0.004	-0.036
	(0.08)	(0.00)	(0.00)	(0.07)	(0.00)	(0.00)	(0.08)	(0.00)	(0.00)
$LLPROV_{j,t}$	4.989	-0.488***	0.075	4.692	-0.5015***	0.067	4.612	-0.482***	0.081
	(4.78)	(0.07)	(0.27)	(4.03)	(0.06)	(0.26)	(4.09)	(0.08)	(0.24)
Observations	846	846	846	846	846	846	846	846	846
Number of banks	6	6	6	6	6	6	6	6	6
F-Statistic	2.35	201.78	322.26	61.28	166.58	854.31	2.81	141.96	547.31
P-value of F stat.	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
Hansen	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
P-value Hansen	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AR2	1.18	1.84	1.33	1.26	1.85	1.34	1.24	1.91	1.33
P-value of AR2	0.24	0.07	0.18	0.21	0.06	0.18	0.21	0.56	0.18
Sargan statistic	475.05	546.17	376.23	480.40	552.55	374.70	482.43	526.13	375.57
P-value Sargan	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bank fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 6: Estimation results of the impact of non-interest income and regulatory changes on risk, performance and capital over the regulatory subperiods

This table presents the estimation results for the system of simultaneous equations (1, 2 and 3) of COVAR, ROA and CAP using the System-GMM. We use quarterly available financial statements and daily market data from 1982 to 2018. The dependent variables are: the systemic risk (COVAR), the return on assets (ROA) and the bank's capital ratio (CAP). Estimations are performed using only data within each regulatory period, namely DEC from 1987 to 2018 to account for the 1987 amendment to the Bank Act; REG1 from 1988 to 1997 to account for the amendment to the Bank Act following Basel I; and REG2 from 1998 to 2018 to account for the amendment to the Bank Act following the 1996 amendment to Basel I and Basel II. The standard deviation of coefficients is given in parentheses. The signs ***, ** and * represent respectively significance levels at 1%, 5% and 10%.

	DEC subperiod only			REG1 subperiod only			REG2 subperiod only		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	COVAR	ROA	CAP	COVAR	ROA	CAP	COVAR	ROA	CAP
Constant	0.131**	0.000	0.008**	0.131***	-0.002*	0.005	0.127***	0.001	0.009**
	(0.04)	(0.00)	(0.00)	(0.03)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)
$COVAR_{j,t-1}$	0.567***			0.193*			0.484***		
	(0.04)			(0.08)			(0.06)		
$ROA_{j,t-1}$		0.055			0.072**			0.148**	
		(0.06)			(0.03)			(0.05)	
$CAP_{j,t-1}$			0.881***			0.813***			0.890***
			(0.04)			(0.02)			(0.05)
$NII_{j,t}$	-0.304	0.274***	0.022	-5.119	0.179*	0.355	-2.133	0.305***	0.068
	(1.75)	(0.06)	(0.15)	(3.64)	(0.08)	(0.42)	(1.95)	(0.07)	(0.15)
$NIM_{j,t}$	-2.364	0.183**	-0.160	-16.379***	0.569**	0.562	0.825	-0.064	-0.575*
	(2.73)	(0.06)	(0.19)	(3.13)	(0.17)	(0.53)	(2.78)	(0.11)	(0.27)
$CAP_{j,t}$	-2.228**			-0.133			-2.299***		
	(0.56)			(0.62)			(0.50)		
$COVAR_{j,t}$		-0.002*	-0.000		0.001	0.005*		-0.000	0.002
		(0.00)	(0.00)		(0.00)	(0.00)		(0.00)	(0.00)

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Table 6 (Continued)

VARIABLES	COVAR	ROA	CAP	COVAR	ROA	CAP	COVAR	ROA	CAP
$GNPG_t$	-0.300***	-0.001	-0.012**	0.101	0.004	-0.004	-0.490***	0.001	-0.011**
	(0.03)	(0.00)	(0.00)	(0.09)	(0.00)	(0.01)	(0.06)	(0.00)	(0.00)
$SIZE_{j,t}$	0.010	0.000*	0.000	0.055***	-0.001	0.001	-0.002	0.000*	0.001
	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)
$LIQUID_{j,t}$	0.080	0.001	0.009	-0.006	-0.001	0.001	0.103	0.000	0.007
	(0.13)	(0.00)	(0.01)	(0.18)	(0.00)	(0.02)	(0.29)	(0.01)	(0.01)
$AGROWTH_{j,t}$	0.036	-0.001	-0.041***	-0.065	-0.001	-0.036***	0.047	-0.001	-0.042***
	(0.10)	(0.00)	(0.00)	(0.15)	(0.00)	(0.01)	(0.12)	(0.00)	(0.00)
$LLPROV_{j,t}$	6.260	-0.655***	0.190	2.323	-0.754***	0.032	27.072**	-0.682***	-0.113
	(5.54)	(0.08)	(0.38)	(1.41)	(0.12)	(0.34)	(9.15)	(0.11)	(0.59)
Observations	714	714	714	234	234	234	492	492	492
Number of banks	6	6	6	6	6	6	6	6	6
F-Statistic	3.21	390.83	941.69	107.82	13.23	378.41	112.83	12.06	427.30
P-value of F stat.	0.11	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00
Hansen	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
P-value Hansen	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AR2	1.57	0.41	1.27	1.63	1.21	0.78	1.17	0.48	1.17
P-value of AR2	0.12	0.68	0.20	0.10	0.23	0.43	0.24	0.63	0.24
Sargan statistic	391.93	430.00	279.76	111.85	147.99	109.98	277.39	278.32	182.19
P-value Sargan	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.06
Bank fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes