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Political Uncertainty and Stock Market Returns: Evidence from the 1995 Quebec Referendum

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Abstract: In this study, we investigate the short run effect of the October 30th, 1995 Quebec referendum on the common stock returns of Quebec firms. Our results show that the uncertainty surrounding the referendum outcome had an impact on stock returns of Quebec firms. We also find that the effect of the referendum varied with the political risk exposure of Quebec firms, that is, the structure of assets and principally the degree of foreign involvement.

Résumé: L'incertitude politique et les taux de rendement boursiers : évidence relative au référendum québécois d'octobre 1995. Dans cette étude, nous examinons l'impact à court terme du référendum québécois du 30 octobre 1995 sur les rendements boursiers d'entreprises ayant leur siège social au Québec. Nos résultats suggèrent que l'incertitude entourant les résultats du référendum a eu un effet à court terme sur les rendements boursiers des entreprises québécoises. Ils montrent aussi que l'impact du référendum a varié avec l'exposition des entreprises québécoises au risque politique, à savoir, leur type d'actifs et surtout leur degré de participation étrangère.

POLITICAL UNCERTAINTY AND STOCK MARKET RETURNS :
EVIDENCE FROM THE 1995 QUEBEC REFERENDUM

I. Introduction

The objective of this paper is to examine the short run impact of political uncertainty surrounding the 1995 Quebec referendum on stock returns of Quebec firms. [2] Several facts argue in favor of such a study. First, political risk is a worldwide phenomenon that affected most national stock markets in the twentieth century. Jorion and Goetzmann (1999) report that events of a political nature have led to market transaction interruptions in twenty-five countries, including Chile, France, Germany, Japan and Portugal. Second, our study involves a developed financial market in which financial information is easily available for most companies. Furthermore, the 1995 Quebec referendum is a "pure" event that is unrelated, for example, to episodes of market liberalization, as is often the case in emerging markets. Thus, our study makes it possible to assess more accurately how variations in the uncertainty related to a political event affect stock returns in the short run. Third, and most importantly, the particularity of the October 30th, 1995 Quebec referendum is that opinion polls released after October 7th, 1995 could not clearly determine a winning side for the referendum. In that sense, there was a unique climate in Canada at that time since financial markets could hardly resolve the political uncertainty before the actual vote took place. This is not typical of election events for which opinion polls can usually reveal the outcome within a reasonable margin of error.[3] Finally

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[2] Note that in this paper we use the term political uncertainty when we focus on the fact that the outcome of the 1995 Quebec referendum could not be anticipated by financial markets before the actual referendum took place. However, when we discuss the impact of the outcome of this referendum on stock prices of Quebec firms, we use the term political risk usually defined in the international financial management literature as "risks to a firm's profitability that are principally the results of forces external to the industry and which involve some sort of government action or, occasionally, inaction" (Henisz, 2002, page 5).

[3] See, for example, Shum's (1996) study of the stock market response to the 1992 Canadian constitutional referendum. Shum argues that one of the reasons investors did not react to the vote was that the outcome had already been factored into stock prices before the actual referendum. Another example is the Parti Quebecois election of September 1994 for which we could not find any short term effect on Canadian or Quebec stock returns. One study that focuses on polls rather than on the actual vote is that of Brander (1991). He shows that there is a statistically significant relationship between opinion polls and the

very few studies (Phillips-Patrick, 1989; Bailey and Chung, 1995; Chan and Wei, 1996) have examined the impact of political risk on the stock market at the microeconomic level. The existing empirical literature has focused on the country as a whole and has implicitly assumed that political risk affects all firms identically.[4]

For the purpose of this study we consider that Quebec firms are not all equally exposed to political risk. We construct different firm portfolios on the basis of two components of firms' exposure to political risk. First, firms that are mainly characterized by growth options should be less exposed to political risk since they are more mobile than firms characterized mainly by assets in place. Second, Quebec firms with large foreign operations should be less affected by Quebec sovereignty than Quebec firms whose activities are limited to local markets. The composition of these portfolios enables us to assess the impact of Quebec political uncertainty on stock returns based on the degree of exposure to political risk[5].

To evaluate the short run impact of Canadian political uncertainty on our portfolios of stocks, we consider an event study. We focus on the Quebec referendum of October 30th, 1995, an event of great importance since it could well have led to the separation of Quebec from the Canadian federation. In fact, during the referendum campaign, the Toronto Stock Exchange faced its sixth largest historical drop. Furthermore, the 1995 referendum campaign also had a significant effect on the value of the Canadian dollar (Lehay and Thomas, 1996) and Canadian bond yields (Johnson and

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Toronto Stock Exchange during the 1988 Canadian general election campaign.

[4] Phillips-Patrick (1989) studies the impact of political uncertainty on abnormal returns of U.S. subsidiaries following Mitterrand's election in 1981 (which was unexpected) and subsequent nationalization. The values of U.S. subsidiaries were not directly observable. Hence, Phillips-Patrick used the reaction of the U.S. parent company to the event as a proxy. To the best of our knowledge, Phillips-Patrick was the first one to show that the impact of political risk varies from firm to firm.

[5] This approach is nonetheless not without any caveats. As pointed out by an anonymous referee, even for internationally oriented firms, the size of the Quebec and Canadian markets may not be negligible. Alternatively, the anticipated disruption with respect to the functioning of headquarters operations in the aftermath of separation would be very important for many Quebec based firms. Furthermore, an independent Quebec would not be able to maintain the existing investment subsidies to growth sectors. Finally it is also possible that our measure of growth options (market to book values) may be an unreliable indicator given that the presence of speculative bubbles will induce a discrepancy between book and market values.

Mcllwrath, 1998)[6]. Interestingly, Brown, Harlow and Ticnic (1988) discuss the role of uncertainty in financial markets and argue that if uncertainty is resolved as the main event date approaches, positive price changes should be expected. Conversely, if the uncertainty relative to an event cannot be assessed before the actual event date, positive price changes should be expected after the event has occurred as uncertainty is resolved. Pantzalis, Stangeland and Turtle (2000) consider this issue in the context of political elections and find a positive market reaction in the two-week period preceding the elections they consider in their study. The effect is largest for elections with the highest degrees of uncertainty. In our case, as discussed above, the 1995 Quebec referendum has an interesting feature: the political uncertainty resulting from the referendum could not easily be resolved before the actual referendum took place since opinion polls did not point to a clear winning side. Furthermore, even after the referendum outcome was known, it remained difficult to ascertain whether the result was a good or a bad one in terms of an increase or a decrease in political risk in the Canadian economy for a long period of time. In fact, in that context, the results of Brown, Harlow and Ticnic (1988) allow us to make some inferences on the nature of the short run impact of the resolution of the uncertainty linked to the fact that the outcome of the referendum could not be predicted. In their paper, the authors show that as uncertainty over the eventual outcome is resolved, subsequent price changes tend to be positive on average, regardless of the nature of the catalyzing event (which is increased or decreased political risk as a result of the referendum outcome in the context of this paper). Furthermore, their approach leads to the conclusion that increases in return and systematic risk are only transitory, which further motivates a study focusing on the short run effect of political uncertainty.

The remainder of the paper is organized as follows. In Section II, we present the background, discussing the relationship between political risk and stock prices. Section III presents research questions and the methodology for testing the relationship between political uncertainty relative to the 1995 Quebec referendum and stock returns. In Section IV, we describe our sample.

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[6] An alternative way to assess the impact of political risk on interest rates is to analyze the movements of the interest rate differential between bonds issued by the governments of Ontario and Quebec. The evidence gathered by Altug, Demers and Demers (2000) suggests that the interest rate spread increases in periods of political uncertainty. Likewise, Johnson and Mcllwrath (1998) report that opinion poll announcements during the 1995 Quebec referendum campaign that increased the likelihood of Quebec sovereignty markedly increased the spread of Quebec bond yields over both Canada and Ontario bond yields.

Section V presents the results while Section VI concludes.

II. Background

In Canada, political instability is associated with the possible separation of the province of Quebec from the Canadian federation. Political risk in Quebec has existed for a long period of time. Most observers of the Canadian political scene trace the political instability of Quebec to the creation of the Parti Quebecois in 1968, a political party dedicated to Quebec sovereignty. Following defeats in the provincial elections of 1970 and 1973, the Parti Quebecois won the 1976 elections and formed Quebec's government. This led to the first episode of political instability, ending in 1980 with a defeat in a referendum on sovereignty. The second episode of political instability began in the 1990s with the failed efforts of the Canadian and provincial governments to solve the "Quebec problem": the Meech Lake Accord did not receive ratification by all Canadian provinces in 1990 and the Charlottetown Accord was rejected in a national referendum in 1992. A new referendum on sovereignty held on October 30th, 1995 was defeated by a margin of one per cent.

The value of a firm is equal to the present value of its expected cash flows, discounted by investors' required rate of return. Both present values of expected cash flows and required rates of return could be affected by a separation of Quebec from the Canadian federation. Indeed, Quebec separation could lead to changes in the cash flows of Quebec-based firms through the uncertainty associated with the fiscal, trade, migration and investment policies (see Altug, Demers and Demers, 2000), such as a tax increase to finance the transition costs, the status of the NAFTA agreement or the moves of head offices from Quebec to another Canadian province (see Tirtiroglu, Dhabra and Lel, 2004). A Quebec separation could also lead to changes in discount rates through the uncertainty associated with monetary policy. Separation from the Canadian confederation would be costly for Quebec, which could well face a financial crisis (Altug, Demers and Demers, 2000). First, Quebec would suffer from a large current account deficit. Second, it would have a large debt problem which could lead to higher borrowing costs. The behavior of the Canadian dollar following a separation is also unforeseeable. Uncertain about the monetary policy to be followed by both Quebec and Ottawa, Canadians could convert many of their assets into American dollars. This would inevitably

lead to a fall in the value of the Canadian dollar and a rise in interest rates.

III. Research questions and methodology

In this section, we describe the measures used to assess the degree of political risk exposure for Quebec-based firms. We then develop two research questions related to the impact of the uncertainty surrounding the referendum of October 1995 on stock returns of Quebec firms on the basis of these exposure measures. Finally, we describe the empirical models used in this study.

A. Measures of exposure to political risk and research questions

We use two measures to assess the degree of political risk exposure of Quebec firms. The first measure evaluates the firm's degree of mobility based on growth options. Myers (1977) breaks the value of a firm down to two components: the assets in place (the value of which does not depend on the firm's future investments) and growth options. Growth options play an important role in decreasing the exposure of a firm to political risk (Phillips-Patrick, 1989). Firms whose value is mainly determined by opportunities for growth are less affected by political risk since they can easily move their operations to another region without incurring excessive costs. Thus, a firm in the pharmaceutical field whose value is determined by growth opportunities should be less affected by political risk since the majority of its investments involve research and development activities that are easily transferable. Conversely, firms whose value is mainly determined by assets in place should be more affected by political risk, given the high cost of moving these assets. For example, a firm in the aluminum industry could not easily transfer such investments to another region.

The second measure of exposure to political risk uses the firm's degree of internationalization based on the number of countries in which it owns subsidiaries. International foreign investment could create new risk factors such as political risk and foreign exchange risk. However, several studies maintain that these new risks are diversifiable (e.g., Beaulieu, Cosset and Essaddam, 2005; Goldberg and Heflin, 1995). Multinational companies operate in a number of domestic markets from which they can minimize the impact of fluctuations in interest rates, cost of input and salaries by transferring their operations from one market to another. As discussed above, the political instability associated with a possible Quebec independence could result in the following pessimistic scenario: flight of capital,

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abandonment of the Canadian currency, institution of exchange controls to curb capital outflows, increase in income tax to finance the independent government's deficit and an increase in the interest rate to offset the lender's risk related to debt sharing. A multinational firm which is headquartered in Quebec but has operations in other countries can diversify political risk away and will be less affected by a possible Quebec independence than a company conducting business solely at the local level.[7]

We want to test the short run impact of the uncertainty surrounding the 1995 referendum on Quebec firm portfolios of stock returns. More specifically, we address the following research question: Did the outcome of the October 30th, 1995 referendum have an impact on the stock market returns of Quebec firms? Ex ante the answer to that question was uncertain considering that opinion polls preceding the actual referendum could not identify a clear winning side. In fact, this is revealed by the referendum results which showed that 50.6% of the Quebec population voted NO to the referendum question. Different outcomes for stock returns were possible after the referendum. First, Quebec firms could show an abnormal positive return since Quebec was to remain a Canadian province and in that context investors' uncertainty towards the economic impact of an independent Quebec would be reduced. Such a reduction would have a positive impact on stock returns. The second possible outcome would be almost no impact for Quebec firms. The results could be interpreted as a split in the Quebec population over the national unity problem. It would mean that Quebec could still separate since another referendum could take place in the future. In such a case, the outcome of the 1995 referendum would not succeed in completely eliminating the uncertainty with respect to Quebec's future in the

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[7] An alternative measure of internationalization for Quebec firms would be the percentage of foreign sales in relation to total sales. We did not consider this measure for two reasons. First, the effect of a possible Quebec independence on Quebec exporting firms is ambiguous. On one hand, Quebec exporting firms could benefit from the fall in the value of the Canadian dollar associated with the political uncertainty in Canada. On the other hand, Quebec export firms will be faced with the business uncertainty related to the renegotiation of international treaties with the rest of Canada and the United States of America. A country like Quebec would have to renegotiate NAFTA. In the meantime, Quebec firms could lose export revenues to the United States and Mexico. Second, data on export sales are not available for most Quebec firms.

Canadian federation. In any case, the Brown, Harlow and Ticnic (1988) uncertainty hypothesis would lead to a positive stock market effect following a negative event and to a non negative effect when the event is positive given that a large amount of the uncertainty is resolved with the outcome of the referendum.

Finally, in the case where the results of the referendum were found to affect the stock market returns of Quebec firms, we would address the following issue: Were different subsets of Quebec firms affected in different ways? Specifically, were domestic firms affected differently from multinational firms and were firms whose value is based largely on growth options rather than assets in place affected differently from other firms?

B. Methodology

Standard event studies (Brown and Warner, 1985; MacKinlay, 1997) are a classic tool used in financial economics to measure the economic impact of a specific event on the value of a firm over a relatively short time period[8]. In this paper we use a classical event study methodology in two different settings. First, since the referendum date is the same for all portfolios, we estimate abnormal returns in a multivariate linear regression (MLR) framework similar to that used in Schipper and Thompson (1983) and Binder (1985). The main advantage of MLR is that it explicitly incorporates contemporaneous dependence of the disturbances into the test statistic. This is important because the event (1995 Quebec referendum) affected all firms during the same calendar time period, creating cross-sectional correlation of the error terms. Second, we believe that it is important to assess the robustness of our results to the time varying volatility of portfolio returns. Bollerslev, Chou and Kroner (1992), for example, highlight the importance of taking into account time varying volatility of stock returns with an ARCH and GARCH parameterization. In an event study framework, this

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[8] At this stage, we would like to make a distinction between the contribution of this study and the previous literature on political risk. While it is often argued that political risk should be diversifiable in the long run from an investor's standpoint, (see, among others, Butler and Joaquim, 1998) and that the empirical evidence is consistent with this view (Beaulieu, Cosset and Essaddam, 2005), this study clearly finds, for a very important political event in Canada for which the outcome could not be anticipated, that political uncertainty impacted on stock returns on a relatively short time span. Given that Brown, Harlow and Ticnic (1988) find that the effect of uncertainty resolution is only transitory in their simulations, it might explain why we find an effect in this event study but none when the long run effect of political risk is considered.

adjustment is important when an event leads to changes in volatility. This is further supported by Brown, Harlow and Ticnic (1988)'s simulation results which reveal that abnormal returns identified in event studies could be due to changes in volatility rather than to changes in required returns. Using a GARCH model will help us assess whether the significance of abnormal returns is affected by changing volatility. We will therefore verify whether the presence of abnormal returns remains using a different method to account for conditional heteroscedasticity.

Let i be the index on portfolios most exposed to political risk (low growth option firms and domestic firms), j be the index on portfolios least exposed to political risk (high growth option firms and multinational firms), $R_{i,t}$ ($R_{j,t}$) be daily returns on portfolio i (j) at time t, $R_{m,t}$ be the market return at time t, D_1, be a dummy variable that takes the value of one on the day of October 31st and zero otherwise, $\tau_i (\tau_j)$ is the parameter used to measure the abnormal return on the day of the window event for portfolio i (j) and let $\varepsilon_{it} (\varepsilon_{jt})$ be error terms from the regression on date t for portfolio i (j). This term is treated as normally distributed with a mean of zero and a constant variance. The stock return equations that we estimate, using White's (1980) correction for the covariance matrix, are the following:

$$R_{i,t} = \alpha_i + \beta_i R_{m,t} + \delta_i R_{i,t-1} + \tau_i D_1 + \varepsilon_{i,t} \qquad (1)$$

$$R_{j,t} = \alpha_j + \beta_j R_{m,t} + \delta_j R_{j,t-1} + \tau_j D_1 + \varepsilon_{j,t} \qquad (2).$$

Our model includes an autoregressive term of order one as a predictor of portfolio returns in order to account for problems of non synchronous trading (Lo and MacKinlay, 1990) and for bid-ask spread effects identified by Stoll and Whaley (1990) in indices that include only a small number of underlying stocks.

Furthermore, we want to check empirically whether we still observe abnormal returns once we use models that account for time variation of stock returns volatility. In order to do that, we use

GARCH (Engle ,1982, Bollerslev, 1986) with BEKK[9] parameterization (Engle and Kroner, 1995) to estimate the volatility of stock returns. This model takes the asymmetry of volatility into account. The asymmetry of volatility is an important feature of stock returns (Engle and Ng, 1993, Glosten, Jagannathan and Runkle, 1993 and Bekaert and Wu, 2000). It prevails when negative and positive shocks to the market do not create symmetric reactions.

When using a GARCH parameterization, we let Γ be a 2 x 2 positive definite matrix, B be a symmetric 2 x 2 matrix for GARCH effects, A be a symmetric 2 x 2 matrix for ARCH effects, G be a symmetric 2 x 2 matrix measuring asymmetric effects in the volatility of stock returns, η_t be the vector $\left(\eta_{it}, \eta_{jt}\right)$, where η_{it}, is max $\left[0, -\varepsilon_{it}\right]$ and η_{jt} be max $\left[0, -\varepsilon_{jt}\right]$, ε_{it} is the vector $\left(\varepsilon_{it}, \varepsilon_{jt}\right)$ which follows a bivariate normal distribution of mean zero and conditional variance H_t. The conditional variance model we consider is as follows

$$H_t = \Gamma + BH_{t-1}B' + A\varepsilon_{t-1}\varepsilon'_{t-1} A' + G\eta_{t-1}\eta'_{t-1} G'. \tag{3}$$

IV. Data

In this section we describe the procedure we use to select and classify the samples of Quebec firms as well as the matching samples of Canadian and American firms.

A. The sample of Quebec firms

Our initial sample consists of 102 firms, headquartered in the Province of Quebec and listed on the *Montreal Stock Exchange* and/or on the *Toronto Stock Exchange*. The data source for stock returns is *Datastream*. The accounting data used to measure growth options are taken from *Stock Guide*, a publication that provides financial information on Canadian firms. The final sample for which we have both common stock prices and accounting data consists of 71 Quebec firms[10]. The sampled firms are then subdivided into two sets of portfolios according to our measures of political uncertainty exposure: (1) growth options versus assets in place; (2) domestic versus multinational operations. The

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[9] BEKK refers to the parameterization first proposed by Baba, Engle, Kroner and Kraft.

[10] As pointed out by a referee, our sample of Quebec firms is small but could not be enlarged in view of data availability.

first subdivision creates two portfolios of Quebec firms: (1) firms with high growth options (HGO) and (2) firms with low growth options (LGO). To classify a Quebec firm as having HGO, the market value to book value ratio must be greater than the median of the sample. This ratio measures the growth opportunities of a firm because the market value of a firm is the value of both assets in place and growth options while the book value of the firm reflects only the assets in place. The second subdivision creates two portfolios of Quebec firms according to the level of foreign activities: the first consists of 45 purely domestic firms (DF) and the second of 26 multinational firms (MF) that operate in at least one foreign country[11] [12]. We draw information regarding the number of foreign subsidiaries from *Who Owns Whom 1989,* a Dun and Bradstreet publication. These directories include a list of subsidiaries and their countries for the sample of Quebec firms. The year 1989 (the year preceding the second episode of political instability in Quebec) is used to measure the two criteria for political risk exposure.[13] The portfolios are then kept fixed over the time period covered by our study. The weights are chosen according to the market value of each firm in the overall value of the portfolio in 1989. Rebalancing only occurs if firms drop out during our sampling period. The market return is proxied by the return on the MSCI index.

Table 1 shows the size distribution of Quebec firm portfolios, with size measured as the book value of total assets. As expected, Quebec multinational firms are large whereas purely domestic Quebec based firms are either small or medium-sized. As for the two portfolios of Quebec firms exhibiting different levels of growth options, we find that the percentage of small firms with low growth options is slightly larger than the percentage of firms with high growth options. Stock returns could vary with the industry. Our Quebec firm portfolios are spread over a wide range of industries, as shown

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[11] Note that the use of a more restrictive criterion to partition our sample of Quebec firms into domestic and multinational firms (e.g., multinational firms are firms that operate in more than one foreign country) would not change the composition of the two subsamples markedly and therefore would provide similar results.

[12] Note that we do not count Canadian (out of Quebec) subsidiaries as foreign.

[13] As discussed above, the second episode of political instability in Quebec began in 1990 with the non-ratification of the Meech Lake Accord by all Canadian Provinces. In light of Phillips-Patrick (1989) and Bailey and Chung's (1995) evidence that political risk and political uncertainty affect the market value of firms and thus our measure of growth options, we assess the degree of political risk exposure of Quebec firms in 1989.

in Table 2. Most industries are represented in the four portfolios of Quebec firms. Table 3 shows the distribution of our samples according to the levels of growth options and foreign operations. Most Quebec multinational firms are characterized by a high level of growth options while most domestic firms operating in Quebec are characterized by a low level of growth options. Furthermore, Table 4 reveals that 96% of Quebec multinational firms operate in at least two foreign countries and 50% of the multinational firms in our sample operate in at least seven foreign countries. In summary, the description of data suggests that most Quebec multinational firms operate in a large number of countries and are characterized by high growth options. Furthermore there is no industry concentration in the sampled firms.

B.   The matching sample of Canadian (non-Quebec) and U.S. firms

To assess the specificity of our results to the Quebec market, we consider a control sample of Canadian (apart from Quebec) and U.S. firms. We create this control sample as follows. First, to control for the industry in which the Quebec firms belong, we match each Quebec firm to all Canadian (U.S.) firms in the same four-digit SIC code. Second, among these, we select the firm whose total assets, value of growth options (measured by the ratio of market to book value of assets) and degree of internationalization (measured by the number of foreign countries in which the firm owns subsidiaries) are between 70 and 130 per cent of the size, the value of growth options and the degree of internationalization of the Quebec-based firm at the end of 1989. If several Canadian (U.S.) firms meet this criterion, we choose the firm for which the value of growth options and the degree of internationalization are closest to those of the Quebec firm. In the absence of Canadian (U.S.) firms which have both the same four-digit SIC code and meet the matching criteria (the value of growth options and the degree of internationalization), we consider Canadian (U.S.) firms with the same three-digit or two-digit SIC codes. Information on the matching sample of Canadian (U.S.) firms is taken from *Compustat* and *Who Owns Whom.*

V. Results

A. Political uncertainty and stock returns from a sample of Quebec firms

Tables 5 and 6 present results on stock returns estimation from equations (1) and (2) applied to different portfolios of Quebec firms with different exposures to political risk. The results reveal that the referendum outcome did affect portfolio returns of Quebec firm portfolios. The effect of the referendum results on these stock returns is positive and statistically significant for all four portfolios. F-tests reject the null hypothesis that there was no impact on abnormal returns when the referendum results were announced. In view of the results of Brown, Harlow and Ticnic (1988), we can infer that the impact noted on the market was linked to uncertainty reduction. The fact that the market reaction was positive with respect to Quebec remaining within the Canadian Confederation can be interpreted as good news to financial markets. It is possible that investors associated the *NO* vote to the 1995 referendum question with a reduction in the economic and political instability although this cannot be clearly inferred from our test. We also note that the effect of the referendum on portfolio returns is larger for firms most exposed to political risk than for firms less exposed to political risk. The impact of political uncertainty is less important for multinational firms than for domestic firms. Tests relative to a different impact of the resolution of the uncertainty surrounding the referendum across firm types allow us to determine whether this difference is statistically significant. Our tests reject the null hypothesis of equal effect when we consider the internationalization criterion as a measure of exposure to political risk: we find that the positive reaction of the stock market to the outcome of the 1995 referendum is larger for domestic firms than for multinational firms. This evidence is consistent with our prediction that domestic firms are more exposed to political risk than multinational firms. It also reveals that domestic firms are more sensitive to uncertainty resolution. We find no support for a different referendum impact across firm types when we consider the growth option criterion. Our tests point us to abnormal returns that are alike whether we consider low growth option or high growth option portfolios.

In order to assess the validity of our results based on portfolio formation, we also regress firm excess returns on the value of growth options and the extent of multinationality as continuous variables. Results

are not reported here but suggest that for our event window the international factor is negative, that is the more important the extent of international activity the less impact the referendum outcome appears to have had on firm returns. The effect is statistically significant at a level of 5 percent. We could not find a significant effect for growth options based on the ratio of market to book value of assets. These cross-sectional results confirm those reported when we compare the excess returns of Quebec firm portfolios on the basis of extent of growth options and the degree of foreign involvement.

Table 7 reports the mean and the standard deviation of abnormal returns of Quebec firm portfolios over the event window [-10, +10]. Essentially, results suggest that the market reaction of Quebec firms to the referendum campaign was negative before the announcement of the vote. For example, six days before the referendum took place, when the climate of uncertainty regarding the referendum was very high, the mean abnormal returns for the four portfolios were significant and negative. This date coincides with the announcement, for the first time, of an opinion poll suggestive of a *YES* vote on the referendum question. The mean abnormal return on the first trading day following the announcement of the referendum outcome is positive and significant. Furthermore, Table 7 shows that mean abnormal returns on the subsequent days are generally insignificant. Finally, we can also associate the fact that abnormal returns are highest for the window [-2,+2] in Panel B of Table 7 with the referendum outcome and the resignation of Jacques Parizeau, Quebec Premier during the referendum campaign, on the day following the referendum. That event helped decrease the uncertainty climate further given that Jacques Parizeau presents himself as a committed "souvereignist".

B. Political uncertainty and stock returns from a sample of Canadian and U.S. firms

The aim of these additional tests is to determine whether results shown in the preceding section are specific to Quebec-based firms, in order to provide evidence that the uncertainty surrounding the outcome of the October 1995 referendum is or is not the source of abnormal returns brought to light for the Quebec firm portfolios. The alternative suggestion would be that the results observed for Quebec firms could be linked to the characteristics of the sample, or that other events of non-political nature could have taken place on October 30th, 1995, the referendum date.

Test results, reported in Tables 8 and 9, suggest that the outcome of the referendum did affect stock returns of Canadian (apart from Quebec) firm portfolios. The short run effect of the referendum

outcome on these stock returns is positive and significant for the four portfolios of Canadian firms. Furthermore, as in the case of the portfolios of Quebec firms, we find that the positive reaction of the stock market to the outcome of the 1995 referendum is larger for domestic firms than for multinational firms. This evidence indicates that the resolution of the political uncertainty associated with the possibility of Quebec independence is an important factor in explaining short run stock returns of Canadian (apart from Quebec) firms. Investors seem to have considered that Quebec independence could have had an effect on Canadian firms outside Quebec through, for example, a flight of capital, an increase in interest rates, a reduction in business investment or a lower level of employment.

Table 10 presents descriptive statistics describing the performance of Quebec firm portfolios relative to the TSE.[14] They reveal that there is no statistically significant difference among the returns on any of our four portfolios or on a portfolio including all Quebec firms and those of the TSE index. This evidence further supports the idea that the uncertainty surrounding the 1995 Quebec referendum affected Quebec firms as well as the overall Canadian market.

The results of the tests for the matching sample of U.S. firms, displayed in Tables 11 and 12, do not provide evidence of a reaction of the U.S. stock market to the announcement of the Quebec referendum outcome. This is further confirmation that the observed abnormal returns of Quebec and Canadian firm portfolios can be traced to the political uncertainty associated with the 1995 referendum on Quebec separation from the Canadian federation.

C. Robustness checks

In the previous sections, we used multivariate equations estimations to investigate the presence of abnormal returns in portfolios of Quebec firms. In this section, we model conditional residual variances using a GARCH process. The objective is to examine whether abnormal returns found in the previous sections are still present when one uses a different estimation approach. Tables 13 and 14 indicate that the behaviour of abnormal returns does not change markedly following the GARCH modeling of conditional residual variances. Indeed, the effect of the 1995 referendum on returns of the four Quebec firm portfolios is still significant and positive. Finally we reran all the previous analysis using the TSE index return to proxy for the market portfolio return in lieu of the MSCI

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[14] We are grateful to an anonymous referee for suggesting a comparison of the Quebec firms with the market as a whole.

index returns. Results were not significantly affected by that change.

VI. Conclusion

In this paper, we investigate the short run impact of the political uncertainty associated with a possible Quebec separation on the stock returns of Quebec-based firms resulting from the 1995 Quebec referendum. To do so, using an event study methodology, we consider that Quebec firms are not equally exposed to political risk and we construct four portfolios of Quebec-based firms on the basis of two components of firm's exposure to political risk: the structure of assets (assets in place versus growth options) and the degree of foreign involvement.

Our results indicate that the short run effect of the referendum results on stock returns is positive and statistically significant for all four portfolios. This evidence suggests that the outcome of the 1995 referendum was not predictable. Yet, as discussed in Brown, Harlow and Ticnic (1988), our results are consistent with the unexpected information hypothesis. That is, we can attribute the referendum results to the resolution of the uncertainty regarding the uncertainty over Quebec political future. Furthermore, the fact that Quebec would remain within the Canadian federation probably was good news to financial markets given the positive reaction of financial markets to the referendum outcome. If the referendum outcome had been negatively interpreted, there would probably have been no reaction given the large decrease in market level when it became clear that the referendum outcome could not be anticipated. This further suggests that investors might have associated the NO vote in the 1995 referendum with a reduction in economic and political instability although this cannot be directed inferred from our results. Nonetheless, our results clearly reveal that political uncertainty can affect short run stock returns of Quebec and Canadian firms when the uncertainty cannot be anticipated by financial markets. We also note that the effect of the uncertainty about the referendum on portfolio returns is larger for firms most exposed to political risk than for firms less exposed to political risk. The impact of uncertainty resolution is less important for multinational firms than for domestic firms. However, this result does not appear to be statistically significant for growth option characterizations.

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Table 1

Size distribution of Quebec firm portfolios

Asset size in dollars	LGO	HGO	DF	MF
1000-25000	*35*	*22*	*40*	*8*
25000-50000	*29*	*25*	*44*	*0*
50000-300000	*12*	*17*	*11*	*19*
300000-1500000	*3*	*17*	*4*	*19*
>1500000	*21*	*19*	*0*	*54*
Total number of firms per portfolio	*36*	*35*	*45*	*26*

This table shows what percentage of portfolios are constituted with firms of different sizes expressed in 000s of dollars at the end of 1989. LGO is the portfolio of Quebec firms with low growth options, HGO is the portfolio of Quebec firms with high growth options, DF is the portfolio of purely domestic Quebec firms and MF is the portfolio of multinational Quebec firms. Data source: *Stock Guide.*

Industry distribution of Quebec firm portfolios

Industry	LGO	HGO	DF	MF
Mining	0	6	4	4
Products and services	11	9	9	12
Furniture	3	3	4	0
Engineering	3	9	4	8
Mining. and oil exploitation, and metallic and chemical industry	6	9	2	15
Forestry and printing	11	9	7	15
Technology hardware and software	9	14	11	12
Transportation, equipment and services	9	17	13	12
Wholesale trading	14	3	13	0
Detail trading	14	9	18	0
Banking and financial services	20	12	15	22
Total number of firms per portfolio	36	35	45	26

Industry distribution at the end of 1989. LGO is the portfolio of Quebec firms with low growth options, HGO is the portfolio of Quebec firms with high growth options, DF is the portfolio of purely domestic Quebec firms and MF is the portfolio of multinational Quebec firms. Data source: *Datastream.*

Table 3

Growth option and international exposure distribution of Quebec firm portfolios

Portfolio	LGO	HGO	Total
DF	57%	43%	100%
MF	38%	62%	100%

LGO is the portfolio of Quebec firms with low growth options, HGO is the portfolio of Quebec firms with high growth options, DF is the portfolio of purely domestic Quebec firms and MF is the portfolio of multinational Quebec firms. Data sources are *Stock Guide, Who owns whom, 1989* and *Datastream.*

Table 4

Distribution of the number of countries other than Canada in which an international firm is operating

Number of foreign countries	Percentage
1	4
2	15
3	27
4	4
7 or more	50
Total	100

Data source: *Who owns whom, 1989.*

Table 5

Stock return equations for portfolios of Quebec firms with low and high growth options

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Panel **A**

The equations are the following

$$R_{i,t} = \alpha_i + \beta_i R_{m,t} + \delta_i R_{i,t-1} + \tau_i D_1 + \varepsilon_{i,t} \qquad (1)$$

$$R_{j,t} = \alpha_i + \beta_i R_{m,t} + \delta_{j,t-1} R_{j,t-1} + \tau_j D_1 + \varepsilon_{j,t} \qquad (2)$$

where i is the index associated with the portfolio most exposed to Canadian political risk (LGO), j is the index associated with the portfolio least exposed to Canadian political risk (HGO), $R_{i,t}$ ($R_{j,t}$) is the daily return on portfolio i (j) at time t, $R_{m,t}$ is the market portfolio at time t proxied by MSCI index daily returns, D_1 is a dummy variable for the

even date which takes the value of one on October 31st, 1995 and zero otherwise, τ_i (τ_j) is the parameter that measures abnormal return for the day of the window event for portfolio i (j) and ε_{it} (ε_{jt}) is the error term resulting from the regression on day t for portfolio i (j). The error term is normally distributed with a mean of zero and a constant variance. Returns have been multiplied by a 100. The dummy variable D, has been multiplied by 10.

	α	β	δ	τ
LGO	-0.002	0.423*	0.087*	0.203*
	(0.021)	(0.031)	(0.021)	(0.089)
HGO	0.025	0.310*	0.129*	0.161*
	(0.014)	(0.021)	(0.020)	(0.060)

Panel B

H_1 is the hypothesis testing whether all are equal to zero. H_2 is the hypothesis testing whether all τ are equal among themselves.

	$H_1 : \tau_{LGO} = \tau_{HGO} = 0$	$H_2 : \tau_{LGO} = \tau_{HGO}$
F-statistic	4.20*	0.27

* represents significant coefficients at the 5% level of significance. Standard errors, based on White's (1980) heteroskedastic covariance matrix, are in parentheses. The sample period goes from January 1990 to December 1996. Daily stock returns are collected from *Datastream.*

Table 6

Stock return equations for portfolios of Quebec domestic and multinational firms

Panel A

	α	β	δ	T
DF	-0.004	0.140*	-0.120*	0.590*
	(0.016)	(0.024)	(0.023)	(0.069)
MF	0.018	0.357*	0.110*	0.161*
	(0.015)	(0.022)	(0.022)	(0.062)

Panel B

H_1 is the hypothesis testing whether all τ are equal to zero. H_2 is the hypothesis testing whether all τ are equal among themselves.

	$H_1 : \tau_{DF} = \tau_{MF} = 0$	$H_2 : \tau_{DF} = \tau_{MF}$
F-statistic	36.82*	25.4*

For model description, see notes to Panel A in Table 5. * represents significant coefficients at the 5% level of significance. Standard errors, based on White's (1980) heteroskedastic covariance matrix, are in parentheses. The sample period goes from January 1990 to December 1996. Daily stock returns are collected from *Datastream*.

Table 7

Abnormal and cumulative abnormal returns of Quebec firm portfolios

Event window of (-10, +10)

Panel A : Abnormal return (AR)

	LGO		HGO		DF		MF	
	Mean	Standard errors	Mean	Standard errors	Mean	Standard errors	Mean	Standard errors
-10	-0.051	0.088	-0.009	0.058	0.056	0.067	-0.027	0.060
-9	-0.139	0.088	-0.043	0.058	-0.016	0.067	-0.076	0.060
-8	0.053	0.088	0.021	0.058	-0.010	0.067	0.034	0.060
-7	-0.167	0.088	-0.149*	0.058	-0.286*	0.067	-0.151 *	0.060
-6	-0.387*	0.088	-0.403*	0.058	-0.439*	0.067	-0.398*	0.060
-5	0.078	0.088	0.169*	0.059	0.000	0.068	0.138*	0.061
-4	-0.122	0.088	-0.117*	0.058	-0.065	0.067	-0.119*	0.060
-3	0.027	0.088	0.044	0.058	-0.063	0.067	0.041	0.061
-2	0.292*	0.088	0.066	0.058	0.106	0.067	0.141*	0.060
-1	0.150	0.088	0.206*	0.058	0.141*	0.067	0.189*	0.060
0	0.203*	0.088	0.159*	0.058	0.591*	0.067	0.159*	0.061
1	-0.154	0.088	-0.170*	0.058	-0.118	0.068	-0.161 *	0.061
2	0.099	0.088	0.162*	0.058	-0.172*	0.067	0.150*	0.060
3	0.138	0.088	0.011	0.058	0.175*	0.067	0.048	0.060
4	0.214*	0.088	0.027	0.058	0.019	0.067	0.092	0.060
5	-0.129	0.088	-0.038	0.058	-0.102	0.067	-0.070	0.060
6	-0.016	0.088	0.000	0.058	-0.181*	0.067	0.001	0.060
7	-0.007	0.088	-0.025	0.058	0.138*	0.067	-0.026	0.060
8	-0.019	0.088	-0.045	0.058	-0.046	0.067	-0.035	0.060
9	0.133	0.088	0.007	0.058	-0.030	0.067	0.051	0.060
10	-0.073	0.088	-0.005	0.058	0.208*	0.067	-0.038	0.060

Panel B Cumulative abnormal return (CAR)

	LGO		HGO		DF		MF	
	Mean	Standard errors	Mean	Standard errors	Mean	Standard errors	Mean	Standard errors
(-10,+10)	0.006	0.020	-0.006	0.013	-0.004	0.015	-0.003	0.014
(-6,+6)	0.030	0.025	0.009	0.017	-0.008	0.020	0.016	0.017
(-10,-1)	-0.027	0.028	-0.022	0.019	-0.057*	0.022	-0.023	0.020
(-6,-3)	-0.102*	0.045	-0.079*	0.030	-0.141*	0.035	-0.087*	0.031
(-2,+2)	0.118*	0.040	0.085*	0.027	0.109*	0.032	0.097*	0.028
(0,+10)	0.035	0.027	0.008	0.018	0.044	0.024	0.016	0.019

 * represents statistical significance at 5%. Standard errors are based on White's (1980) heteroskedastic covariance matrix. LGO is the portfolio of Quebec firms with low growth options, HGO is the portfolio of Quebec firms with high growth options, DF is the portfolio of purely domestic Quebec firms and MF is the portfolio of multinational Quebec firms.

Table 8

Stock return equations for portfolios of Canadian (apart from Quebec) firms with low and high growth options

Panel A				
	α	β	δ	τ
LGO	-0.017	0.247*	0.135*	0.253*
	(0.016)	(0.024)	(0.021)	(0.070)
HGO	0.035	0.319*	0.095*	0.292*
	(0.018)	(0.027)	(0.021)	(0.079)

Panel B

H_1 is the hypothesis testing whether all τ are equal to zero. H_2 is the hypothesis testing whether all τ are equal among themselves.

	$H_1: \tau_{LGO} = \tau_{HGO} = 0$	$H_2: \tau_{LGO} = \tau_{HGO}$
F-statistic	9.32*	0.22

For model description, see notes to Panel A in Table 5. * represents significant coefficients at the 5% level of significance. Standard errors, based on White's (1980) heteroskedastic covariance matrix, are in parentheses. The sample period goes from January 1990 to December 1996. Daily stock returns are collected from *Datastream*.

Table 9

Stock return equations for portfolios of Canadian (apart from Quebec) domestic and multinational firms

Panel A				
	α	β	δ	τ
DF	-0.034	0.247*	0.050*	0.463*
	(0.017)	(0.024)	(0.022)	(0.071)
MF	0.027	0.316*	0.106*	0.275*
	(0.017)	(0.025)	(0.022)	(0.073)

Panel B

H_1 is the hypothesis testing whether all τ are equal to zero. H_2 is the hypothesis testing whether all τ are equal among themselves.

	$H_1: \tau_{DF} = \tau_{MF} = 0$	$H_2: \tau_{DF} = \tau_{MF}$
F-statistic	23.57*	4.40*

For model description, see notes to Panel A in Table 5. * represents significant coefficients at the 5% level of significance. Standard errors, based on White's (1980) heteroskedastic covariance matrix, are in parentheses. The sample period goes from January 1990 to December 1996. Daily stock returns are collected from *Datastream*.

Table 10
Descriptive statistics of Quebec portfolio returns versus the TSE index returns

LGO is the portfolio of Quebec firms with low growth options, HGO is the portfolio of Quebec firms with

	LGO-TSE	HGO-TSE	DF-TSE	MF-TSE	QF-TSE
Mean*100	-0.010	0.018	-0.019	0.011	0.011
Median*100	-0.065	0.017	-0.020	0.016	0.012
Maximum*100	2.942	2.443	3.800	1.837	1.849
Minimum*100	-3.044	-1.826	-3.132	-1.723	-1.681
Std. Dev.*100	0.675	0.413	0.771	0.364	0.351
Skewness	0.182	-0.012	0.091	0.161	0.164
Kurtosis	4.081	4.363	4.053	4.465	4.521

high growth options, DF is the portfolio of purely domestic Quebec firms, MF is the portfolio of multinational Quebec firms, QF is the value-weighted portfolio of all Quebec firms and TSE is the return on the TSEindex. The sample period goes from January 1990 to December 1996**.** Number of observations is 1764. Data sources are *Stock Guide, Who owns whom, 1989* and *Datastream.*

Table 11

Stock return equations for portfolios of American firms with low and high growth options

	α	β	δ	τ
LGO	-0.005	0.327*	0.069*	-0.019
	(0.013)	(0.019)	(0.022)	(0.054)
HGO	0.012	0.221 *	-0.058*	0.018
	(0.009)	(0.014)	(0.022)	(0.038)

For model description, see notes to Panel A in Table 5. * represents significant coefficients (1980) heteroskedastic covariance matrix, are in parentheses. The sample period goes from January 1990 to December 1996. Daily stock returns are collected from *Datastream* .at the 5% level of significance. Standard errors, based on White's (1980) heteroskedastic covariance matrix, are in parentheses.

Table 12

Stock return equations for portfolios of American domestic and international firms

	α	β	δ	τ
DF	0.031*	0.085*	0.108*	-0.001
	(0.011)	(0.016)	(0.023)	(0.045)
MF	0.011	0.242*	-0.064*	0.018
	(0.009)	(0.014)	(0.022)	(0.040)

For model description, see notes to Panel A in Table 5. * represents significant coefficients at the 5% level of significance. Standard errors, based on White's (1980) heteroskedastic covariance matrix, are in parentheses. The sample period goes from January 1990 to December 1996. Daily stock returns are collected from *Datastream.*

Table 13

Return equations of portfolios of Quebec with low high growth options using a bivariate GARCH model

$R_{i,t} = \alpha_i + \beta_i R_{m,t} + \delta_i R_{i,t-1} + \tau_i D_1 + \varepsilon_{i,t}$			(1)
$R_{j,t} = \alpha_j + \beta_j R_{m,t} + \delta_j R_{j,t-1} + \tau_j D_1 + \varepsilon_{j,t}$			(2)
$H_t = \Gamma + BH_{t-1}B' + A\varepsilon_{t-1}\varepsilon'_{t-1}A' + G\eta_{t-1}\eta'_{t-1}G'$			(3)

	α	β	δ	τ
	0.005	0.428*	0.087*	0.203*
LGO	(0.023)	(0.025)	(0.021)	(0.010)
	0.031	0.314	0.146	0.157*
HGO	(0.012)	(0.016)	(0.019)	(0.007)

 * represents significant coefficients under robust standard errors (Bollerslev and Wooldridge, 1992) at the 5% level of significance. Standard error are in parentheses. M represents returns on the MSCI benchmark portfolio. LGO is the portfolio of Quebec firms with low growth options, HGO is the portfolio of Quebec firms with high growth options. The sample period goes from January 1990 to December 1996. Daily stock returns are collected from *Datastream.*

Table 14

Return equations of portfolios of domestic and international Quebec firms using a bivariate GARCH model

$R_{i,t} = \alpha_i + \beta_i R_{m,t} + \delta_i R_{i,t-1} + \tau_i D_1 + \varepsilon_{i,t}$			(1)
$R_{j,t} = \alpha_j + \beta_j R_{m,t} + \delta_j R_{j,t-1} + \tau_j D_1 + \varepsilon_{j,t}$			(2)
$H_t = \Gamma + BH_{t-1}B' + A\varepsilon_{t-1}\varepsilon'_{t-1}A' + G\eta_{t-1}\eta'_{t-1}G'$			(3)

	α	β	δ	τ
	0.010	0.149*	-0.122*	0.590*
DF	(0.017)	(0.020)	(0.027)	(0.010)
	0.023	0.354*	0.119*	0.158*
MF	(0.018)	(0.021)	(0.025)	(0.006)

* represents significant coefficients under robust standard errors (Bollerslev and Wooldridge, 1992) at the 5% level of significance. M represents returns on the MSCI benchmark portfolio. DF is the portfolio of purely domestic Quebec firms and MF is the portfolio of multinational Quebec firms. The sample period goes from January 1990 to December 1996. Daily stock returns are collected from *Datastream.*