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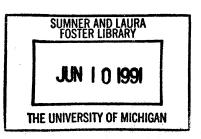# The Anticipated Sectoral Impact of the Canada-United States Free Trade Agreement: An Event Study Analysis

by

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Acknowledgements

1 Introduction

The Canada-United States Free Trade Agreement (FTA), implemented on January 1, 1989, eliminates all tariffs on Canadian-U.S. trade as well as some non-tariff barriers by 1998. In addition, the agreement establishes new dispute settlement procedures with the intent to provide a more predictable trade environment. It is too soon to estimate the actual effects of the FTA. Instead, the approach employed in this paper is to investigate the market's expectations about the consequences of the FTA for manufacturing industries in Canada by using a stock market event study.

Event studies measure the effects of a particular event or series of events on security prices by estimating the "abnormal" returns that correspond to the event date or dates. They have been used with some frequency in the fields of industrial organization and public finance to study the effects of policy changes,[1] and they are a common method of empirical study in the field of finance. There have only been a few applications of this method in the field of international trade.[2] In a recent paper, Brander (1989) finds that the public opinion polls published during the 1988 Canadian General Election campaign (during which the FTA was the primary issue) had a significant effect on the Toronto Stock Exchange index (TSE 300). He suggests, however, that more detailed research is necessary to determine the link between expectations about the FTA and the stock market reaction to the election polls.

In this paper, abnormal returns on industry portfolios of Canadian manufacturing firms are

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[1]See, for example, Burns (1977), Rose (1985), Smith, Bradley and Jarrell (1986), Borenstein and Zimmerman (1988) and Slemrod (1990).

[2]See Hartigan, Perry and Kamma (1986). Grossman and Levinsohn (1989) and Brander (1989) employ a method similar to an event study to analyze the relationship between stock prices and trade.

estimated to examine the anticipated interindustry adjustments to the FTA. During the free trade debates in Canada, a great deal of emphasis was placed on the gains achieved through intraindustry trade and the realization of economies of scale. Intraindustry and interindustry trade are not mutually exclusive, however. Computable general equilibrium studies of the FTA, such as Brown and Stern (1988) and Cox and Harris (1984), suggest that both interindustry and intraindustry adjustments to the agreement may be significant. Helpman and Krugman (1985) provide theoretical support for this notion. They consider a simple two-sector, two-factor model. One sector is characterized by a homogeneous product and constant returns to scale and the other sector by differentiated products and firm-level increasing returns to scale. With free trade, intraindustry trade occurs within the increasing returns to scale sector. Each country produces fewer varieties and thus achieves greater economies of scale. Net imports and exports, however, are determined by comparative advantage. Therefore, the presence of intraindustry trade does not preclude the discussion of interindustry trade adjustments. The goal of this paper is to identify industries that were expected to expand or contract as a result of the FTA.[3]

The notion that an event study can be used to analyze the anticipated interindustry adjustments to the FTA rests primarily on two assumptions: 1) that capital is specific to a given sector; and 2) that capital markets are efficient.

In a model where capital is specific to the sector in which it is employed, the real return to capital rises in sectors that are positively affected by trade policy and falls in sectors that are

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[3]Thompson (1991a) further explores the relationship between stock market prices and the FTA. Abnormal returns are estimated for individual Canadian manufacturing firms and related to hypothesized determinants of comparative advantage and to factors relating to firm size and ownership.

negatively affected.[4] This is in contrast to the Stolper-Samuelson (1941) theorem which, under the assumption of perfectly mobile capital, predicts that the real return to capital will either rise in all industries or fall in all industries depending on the country's factor endowments. Magee (1980) and Grossman and Levinsohn (1989) provide evidence that supports the assumption that capital is not intersectorally mobile. Magee studies lobbying patterns and finds that capital and labor employed in the same sector are more likely to be on the same side than on opposing sides of trade policy issues. Grossman and Levinsohn measure the sensitivity of stock market returns to news relating to the level of import prices. They are able to reject the hypothesis of perfect capital mobility in five of the six industries that they study.

With efficient capital markets, the price of a security represents the expected stream of future net cash flows minus the market value of debt. According to the Efficient Markets Hypothesis, security prices fully reflect all available information and adjust immediately to new information. Empirical investigations reveal that security prices do indeed adjust promptly to new information.[5] Therefore, expectations about the way in which the FTA will affect the value of future cash flows for a given firm should be reflected in the firm's security price at the time the agreement was first anticipated. Security prices can be expected to have adjusted to any event that altered the perceived probability that the agreement would be implemented.

Three sets of events are identified that are believed to have contained new information about the FTA. Each set of events involves two individual events: an unexpected setback to the agreement followed by its resolution. Abnormal returns corresponding to the six events are estimated for value-

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[4]See Mussa (1974) and Neary (1978).

[5]See Fama (1970 and 1976) for a review of empirical studies in this area.

weighted industry portfolios of manufacturing firms in Canada. These abnormal returns represent an estimate of investors' predictions about the interindustry adjustments to the FTA. Statistical evidence is presented that suggests that the abnormal returns do reflect expectations about the FTA, although these abnormal returns are small relative to their standard errors.

2 Method of Study

2.1 Definition of Abnormal Returns

To estimate the impact of an event on the stock market return of a given portfolio, it is necessary to predict first what the return would have been in the absence of the event. Following the event study literature, the abnormal return on industry portfolio i at time t, AR_{it}, is estimated as the prediction error of the Capital Asset Pricing Model (CAPM):

$$r_{it} = \alpha_i + \beta_i r_{mt} + \epsilon_{it}, \tag{1}$$

where r_{it} is equal to the return on portfolio i at time t, α_i is equal to the average daily return on portfolio i, β_i is equal to the systematic risk of portfolio i, r_{mt} is equal to the return on the market portfolio, and ϵ_{it} is a stochastic error term, assumed to have a zero mean and a constant variance σ^2.

Using matrix notation, the above equation for an individual portfolio may be re-expressed as:

$$Y_i = X\beta_i + \epsilon_i, \tag{2}$$

where Y_i is equal to the $T \times 1$ vector of returns on portfolio i, X is equal to the $T \times 2$ matrix of explanatory variables (the return on the market index and the constant term), β_i is equal to the

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2×1 vector of coefficients corresponding to portfolio i, ϵ_i is equal to the $T \times 1$ vector of disturbances corresponding to portfolio i and T is equal to the number of observations within the estimation period. The subscript i will be omitted from this point on. It is assumed that the covariance matrix, Ω, is of the form $\sigma^2 I$ which is consistent with the Efficient Markets Hypothesis and the supporting empirical literature.[6] [7]

Abnormal returns are estimated for each observation within a period referred to as an "event window." An event window includes observations surrounding the event date to allow both for the possibility that news leaked out before the public announcement of the event and for information lags. The vector of abnormal returns for each observation in the event window is calculated as the prediction error:

$$AR = Y_0 - X_0 \hat{\beta},$$

where AR is equal to the $T_0 \times 1$ vector of abnormal returns, Y_0 is equal to the $T_0 \times 1$ vector of event window returns, X_0 is equal to the $T_0 \times 2$ matrix of event window explanatory variables, $\hat{\beta}$ is equal to the 2×1 vector of estimated coefficients, and T_0 is equal to the number of observations within the event window. With efficient capital markets, an individual abnormal return provides an unbiased estimate of the change in the expected value of future cash flows to the portfolio.

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[6] See Fama (1970 and 1976).

[7] The Durbin Watson statistics for some of the estimation equations indicate that the error terms are serially correlated. Correction for serial correlation, however, does not affect the results. The serial correlation is possibly a result of nonsynchronous or infrequent trading. Sensitivity analysis in Thompson (1991a) indicates that the implications of the results presented here are not altered by correction for nonsynchronous trading using the Dimson (1979) Aggregated Coefficients Method. Fowler and Rorke (1983) show that this method is consistent with the Scholes and Williams (1977) technique when the returns on the market portfolio are not serially correlated.

To capture the full impact of the event, the abnormal returns are summed over the event window to form the cumulative abnormal return (CAR):

$$CAR = \Sigma_{t=1}^{T_0} AR_t, \tag{3}$$

where AR_t represents the tth element of the vector AR. The covariance matrix of the abnormal returns vector is equal to:

$$\sigma^2[I + X_0(X'X)^{-1}X_0'], \tag{4}$$

where I is a $T_0 \times T_0$ identity matrix. The first term represents the variance due to random disturbance and the second term represents the sampling error. The variances of the individual abnormal returns are given by the diagonal elements of the matrix and the covariances between abnormal returns are given by the off-diagonal elements. As discussed by Salinger (1988), these off-diagonal elements will be non-zero due to the sampling error that is common to all of the abnormal returns. Thus, even if the actual returns can be assumed to be serially uncorrelated, it does not follow that the abnormal returns will also be serially uncorrelated. The variance of the cumulative abnormal return is equal to the sum of the variances of the individual abnormal returns plus twice the sum of their covariances, which may be expressed as:

$$Var(CAR) = \sigma^2 \iota'[I + X_0(X'X)^{-1}X_0']\iota, \tag{5}$$

where ι is a $T_0 \times 1$ unit vector.

The total cumulative abnormal return (TCAR), an overall measure of the effect of information relating to the agreement on the returns on the industry portfolios, is obtained by summing the cumulative abnormal returns over the event windows for each portfolio. The abnormal returns that

correspond to "negative" events (i.e. those events that decreased the perceived probability that the agreement would be implemented) are multiplied by negative one. The null hypothesis is that the agreement had no impact on stock returns. This implies that the TCAR equals zero. The variances of these TCARs are computed from the variances and covariances of the individual CARs. Due to sampling error, the abnormal returns based on the same estimation data are correlated. The null hypothesis implies that the remaining covariances equal zero.

2.2 Estimation Procedure

Event studies typically use one of two techniques to estimate abnormal returns. The "forecast method" involves two stages. In the first stage, the market model parameters are estimated with data outside of the event window. In the second stage, these parameter estimates are used to calculate the prediction errors within the event window. The "dummy variable method" involves estimating the following equation with data that is inclusive of the event window(s):

$$r_{it} = \alpha_i + \beta_i r_{mt} + D_{it}\gamma + \mu_{it}, \tag{6}$$

where the dummy variable, D_{it}, is equal to one for event window observations and zero otherwise and μ_{it} is a random disturbance term. The coefficient on the dummy variable γ then represents the average cumulative abnormal return, and the variance of this coefficient is equal to the variance of the average cumulative abnormal return. Calculation of this variance can be quite cumbersome using the two-stage forecast method. Thus, the dummy variable method has the advantage of being computationally convenient.

There are two disadvantages to the traditional dummy variable method however. First, as

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discussed by Salinger (1988), to estimate the impact of an event on the value of a firm or portfolio, the appropriate prediction equation is based on the pre-event market model parameters. If the event alters the market model parameters (i.e. by altering the systematic risk of the firm), then, by including the event window data in the estimation period, the dummy variable procedure will not provide accurate estimates of the pre-event parameters.

Second, if the event affects a large number of the securities included in the market portfolio, as in the case of the FTA, then the dummy variable method will yield biased and inconsistent parameter estimates. This is illustrated by Levinsohn and MacKie-Mason (1989). The disturbance term in equation 6 can be thought of as comprising two components:

$$\epsilon_{it} = D_{it}\gamma + \mu_{it}. \tag{7}$$

If the event affects the market index, then the return on the market index will be correlated with the event dummy in the disturbance term. An assumption of the CAPM model is that the return on the market portfolio is not correlated with the disturbance term, ϵ_{it}. Under this assumption, the return on the market index must be correlated with μ_{it} if it is correlated with the event dummy, since the sum of these two correlations must equal zero. Thus, the parameter estimates of equation 6 will be biased and inconsistent.

In this paper an estimation procedure is used that obtains consistent estimates of the pre-event market model parameters, yet still achieves the computational convenience of the traditional dummy variable method. This prediction procedure was suggested by Salkever (1976), but has not been applied to event studies.[8] It involves using a separate dummy variable for each observation in

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[8] I have recently learned that Salinger (1990) applies this technique to event studies as well.

the event window rather than one dummy variable for all of the event window observations. The model that is estimated is as follows:

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\begin{bmatrix} Y \\ Y_0 \end{bmatrix} = \begin{bmatrix} X & 0 \\ X_0 & I \end{bmatrix} \begin{bmatrix} \beta \\ \gamma \end{bmatrix} + \begin{bmatrix} \epsilon \\ \eta \end{bmatrix}
\tag{8}
$$

where the subscript "0" denotes data during the event window, the matrix 0 is a $T \times T_0$ null matrix, I is a $T_0 \times T_0$ identity matrix, and γ is a $T_0 \times 1$ vector of parameters. By using a different dummy variable for each day in the event window, least squares estimation of this system will yield estimates of β and $var(\hat{\beta})$ that are identical to those that would be obtained by estimating equation 2 with pre-event data (i.e. using the forecast method). Thus, they are unaffected by the event window data. The estimates of the γs equal the prediction errors or, equivalently, the abnormal returns, and their estimated covariance matrix is equal to $s^2[I + X_0(X'X)^{-1}X_0']$ where s^2 is a consistent estimator of σ^2.

The market model parameters are estimated separately for each industry portfolio for set of events.[9] Each estimation period begins after the previous event and ends before the event in question. This method is known as the "rolling beta" method of estimation. In contrast, a "constant beta" method is often used. Under the latter approach, the market model is estimated only once, either for the period preceding the first event or for one period inclusive of all of the events, and the results are then used to estimate all of the abnormal returns. This approach is only appropriate if

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[9]The abnormal returns are likely to be contemporaneously correlated due to unobserved shocks that are common to more than one industry in the sample. Thus, it may appear that the appropriate estimation procedure would involve the estimation of seemingly unrelated regressions. The explanatory variables (event dummy variables), however, are identical for each industry and it is well known that under these circumstances, ordinary least squares parameter estimates are identical to seemingly unrelated regressions estimates.

the market model parameters do not change over time and are not affected by the events. In the case of the FTA, this assumption does not seem reasonable. Thus, the rolling beta method is used.

3 Description of Data

3.1 Description of Events

Studies by Brown and Warner (1980) and Binder (1985) indicate that the ability of an event study to detect abnormal returns is substantially weakened when it is not known precisely when market expectations changed. It is therefore important to determine as accurately as possible the timing of events. The following chronology was compiled by searching the *Wall Street Journal Index* and the *Canadian News Index* for any mention of the FTA. While the long negotiating process that led to the eventual implementation of the FTA will unfortunately obscure many of the events, there are three sets of events that can be considered good candidates for an event study. Each set of events involves an unexpected setback during the negotiations followed by its resolution.

On March 17, 1985, Prime Minister Mulroney met with President Reagan for the "Shamrock Summit" where they made a commitment to explore the possibilities of eliminating trade barriers between the two countries. In September, Mulroney invited Reagan to enter negotiations. Shortly thereafter, Reagan informed the U.S. Congress of his intent to begin negotiations with Canada under the fast-track provision of the Trade Act of 1974. This provision would commit Congress to reject or enact the implementing legislation of the agreement without amendment. Thus an item-by-item Congressional review would be avoided.

The first important setback to the FTA negotiations occurred when the U.S. Senate Finance

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Committee announced unexpectedly on April 11, 1986 that it was prepared to deny authorization of fast-track consideration of the FTA. Canadian officials warned that the offer to negotiate might be withdrawn if fast-track consideration could not be guaranteed. After much lobbying on the part of the Reagan Administration, the final vote was a tie after one senator changed his vote within hours of the deadline. Fast-track authorization was then granted and negotiations began on June 17, 1986.

The second important setback occurred when the negotiations were broken off in September, 1987. Under the fast-track provision, the deadline for submitting the completed agreement to the U.S. Congress was October 3, 1987. As was to be expected, negotiations were difficult. Talks were deadlocked in September and were broken off on September 23, just ten days before the deadline.[10] It was announced at midnight on September 30 that the negotiations would be resumed. On Saturday, October 3, an agreement was reached within one hour of the midnight deadline. The final version of the agreement was submitted on December 11, and it was signed by Reagan and Mulroney on January 2, 1988.

The implementing legislation was passed by the U.S. House of Representatives on August 10, and by the U.S. Senate on September 20. There was much opposition to overcome in Canada, however. The Liberal Party in the Senate announced on July 21 that it would block the agreement until after the General Election. Both of the opposition parties vowed to abrogate the agreement if elected. It was clear that the Progressive Conservative Party would need to win by a majority to ensure passage of the Free Trade Agreement. When Mulroney called the election (October 1,

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[10]This breakdown in negotiations was viewed with some skepticism, however. It was considered by some to be merely a negotiating tactic. (*Globe and Mail*, September 24, 1987, p. B1.)

1988) to be held on November 21, it was assumed by many that the Conservatives would win. The public opinion polls published within the first few weeks of the campaign confirmed this belief. The turning point of the election occurred after the set of televised debates on October 24th and 25th. Turner, the leader of the Liberal Party, emerged as the winner. Public opinion polls taken after the debates indicated that the Liberal and Conservative parties were virtually tied (Angus Reid, October 29, 1988), that the Liberals had pulled ahead (Globe and Mail Environomics Poll, November 1, 1988) and then, most dramatically, that the Liberals had a ten percentage point lead over the Conservatives (Gallup Poll, November 7, 1988).

Support then began to drift back towards the Conservative Party. According to the *Globe and Mail* (November 16, 1988 and November 17, 1988) there were unconfirmed reports of increasing Conservative support. Three national public opinion polls, released on Saturday November 19, indicated a surge of support for Mulroney and the Conservatives (*Wall Street Journal*, November 21, 1988). When the stock market opened on Election Day (Monday, November 21), it was anticipated (correctly) that the Conservative Party would win the election and that the FTA would be implemented.

To summarize, the events that appear to have contained new information are: 1) the Senate Finance Committee's announcement that it planned to reject the request for fast-track authorization; 2) the subsequent approval of the fast-track procedure; 3) the breakdown of the Canada-United States negotiations; 4) the resumption of negotiations and the subsequent agreement; 5) the televised debate during the Canadian General Election campaign and period during which public opinion polls were released indicating that the Turner was gaining in popularity; and 6) the election. The last three of these events are likely to be the most important. At the time of the first

two events, there was still much uncertainty about whether an agreement would be reached and the form that it would take. The breakdown in negotiations (September 23, 1987) occurred in the midst of a difficult negotiating process. It therefore was not entirely unexpected. In addition, as mentioned above, some viewed this as a negotiating tactic. For completeness, abnormal returns are estimated for all six events. Special attention, however, is paid to the final three events.

The precise dates of the event windows are described in Appendix A. Information from sources such as public opinion polls and press interviews was used to determine more precisely if and when the events were anticipated. The event windows extend two days past the day the event was published in the newspapers.

3.2 Description of Stock Market Data

The stock market data used in this study are daily returns on the common stock of the manufacturing firms included in the TSE/Western Database. This database, which is compiled by the Toronto Stock Exchange and the University of Western Ontario, contains data on all securities traded on the Toronto Stock Exchange as well as a small number of securities traded on the Vancouver and Montreal Exchanges. To create industry portfolios, firms are classified according to the 2-digit Standard Industrial Classification code assigned to them by Dun and Bradstreet's *Canadian Key Business Directory*. Firms that are not listed in this directory are classified according to their annual reports or the "nature of business" assigned to them by the Toronto Stock Exchange. Ideally, one would want to create portfolios at a higher level of disaggregation. Unfortunately, however, because most firms produce a number of different products it is difficult to meaningfully assign them to portfolios at a level above the 2-digit level. The weights for the portfolios are based on

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the share price and number of shares outstanding during September 1988 (the month before the Canadian election was called).[11] These data are obtained from the *Toronto Stock Exchange Review*.

A one year estimation period is used for each set of event windows. The estimation period ends two weeks before the beginning of the first event window to allow for the (unlikely) anticipation of events before the beginning of the event window. Only firms that were traded continuously during both the relevant estimation period and the event window are included in the portfolio for that event window. Thus the composition of firms differs from one set of event windows to the next. Table 1 provides the number of firms in each portfolio.

The value-weighted index of all the securities included in the TSE/Western database is used as a proxy for the market portfolio. In the finance literature, the market portfolio is defined to include all securities traded on the world market. The decision to define the market portfolio here as comprising only firms traded on the Canadian stock exchanges rather than those firms traded on an integrated North American market or a global market is supported by the findings of Jorion and Schwartz (1986). In their study of the pricing of Canadian assets, the hypothesis of an integrated North American market is rejected in favor of a segmented domestic market.

It is important to note that the FTA is likely to have an impact on the Canadian economy. This would be reflected in the return on a market index of Canadian securities. An individual industry, in turn, is likely to be affected indirectly by these economy-wide effects. By estimating the abnormal return on the Canadian portfolios as the prediction error of the CAPM, these indirect effects will not be captured. Instead, the abnormal return will reflect only the direct effects of the FTA on the portfolio. In the sensitivity analysis section below, abnormal returns are reestimated using a

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[11] For firms whose stock was not traded during this period, data from an earlier period is used.

portfolio of firms traded on the New York Stock Exchange as a proxy for the market portfolio. It is found that the results are relatively robust to the definition of the market portfolio.

4 Results

Prior to investigating how individual Canadian industries were expected to fare under the FTA, the market's expectation concerning the net effect of the agreement on Canadian firms as a whole is examined. Theories based on comparative advantage predict that some sectors of the economy will gain and some will lose as a result of trade liberalization, but that the net effect on the economy will be positive. In other words, there will be gains from trade. As reported by Brown and Stern (1990), predictions derived from computable general equilibrium and macroeconometric models about the effect of the FTA on the real income in Canada range from -0.3% to 8.9%. After a review of this literature, Brown and Stern conclude that the feasible range of estimates is from 1% to 2.5%. If stockholders share in the gains from trade, then stock market prices in Canada, on average, should have risen in response to events that increased the perceived likelihood that the agreement would be implemented and fallen in response to events that reduced the perceived likelihood that the agreement would be implemented. On the other hand, one of the expected benefits of the agreement is that it will increase competition, which will then reduce profits. This suggests that stock market prices may fall in response to "good news" about the FTA. Thus it is not clear, a priori, that stockholders will benefit from the FTA.[12]

To isolate movements in the Canadian stock market due to the FTA from those due to other

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[12]See Brander (1989) for a more detailed discussion of the potential net effect of the FTA on the stock market value of Canadian firms.

new information learned during the event windows, movements in the U.S. stock market are used as a benchmark. The Canadian and U.S. markets are affected by many of the same economic factors such as oil prices and global macroeconomic conditions. While the United States will also be affected by the FTA, it is not likely that the agreement will have a large impact on the U.S. economy due to its large size relative to Canada. Thus, an index of U.S. securities can be expected to reflect many of the non-FTA events that affect the Canadian market and yet be relatively insensitive to news about the FTA.

The model to be estimated is:

$$r_{C,t} = \alpha + \beta r_{US,t} + \epsilon_t. \tag{9}$$

The return on the U.S. index captures economic shocks that are common to both countries. The prediction errors (abnormal returns) of this model then capture shocks, such as news about the FTA, that are specific to Canada. This model is estimated using the value-weighted TSE/Western index as the measure of Canadian securities and the value-weighted index of the securities included in the Center for Research on Security Prices (CRSP) database of the University of Chicago as the measure of U.S. securities.[13] In addition, the analysis is repeated using the TSE 300 index as the measure of Canadian securities and the Standard and Poor 500 index as the measure of U.S. securities.

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[13] Because Canadian and U.S. holidays do not coincide exactly, there are days in which one exchange was open and the other was closed. These observations are excluded from the sample. The return on the day following the holiday will reflect information learned over the two days for the market that was closed on the holiday and information learned on only the second day for the market that was open. Therefore, following Brown and Warner (1985), the returns on the days following the holidays are excluded as well.

The results are presented in Table 2. Events one, three and five are "negative" events with respect to the agreement because they reduced the perceived probability that the agreement would be implemented. Events two, four and six are "positive" events with respect to the agreement because they increased the perceived probability that the agreement would be implemented. For an index of Canadian firms to exhibit a consistent reaction to the six events, the abnormal returns must be either positive for all three positive events and negative for all three negative events, or negative for all three positive events and positive for all three negative events. As seen in Table 2, the abnormal returns on the two indexes do not exhibit a consistent reaction to the agreement.

The cumulative abnormal returns are summed over all six events to calculate the total cumulative abnormal return (TCAR). In addition, a second TCAR is calculated for the last three events since these are believed to be the most important. As discussed above, to create these TCARs abnormal returns corresponding to the "negative events" have been multiplied by negative one. Thus, a positive TCAR indicates that the implication of the six abnormal returns as a group is that the expected net impact of the agreement on Canadian firms was positive, and a negative TCAR indicates that the six abnormal returns imply that the expected net impact was negative. As seen in Table 2, the TCARs of both indexes are positive for both sets of events, but very small relative to their standard errors.

Using a method similar to an event study, Brander (1989) finds that there is a positive and statistically significant relationship between movements in the TSE 300 and the public opinion polls published during the Canadian General Election campaign. This suggests that the overall value of Canadian securities was positively affected by the news relating to the General Election, of which the FTA was the primary issue. The continuous information provided by the public opinion polls

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enables a more precise estimation of the relationship between security prices and news than the discrete event windows employed in this study. Unfortunately, however, this detail of information is not available for other events leading to the implementation of the FTA. To distinguish between shocks resulting from the FTA related news and those resulting from news about other aspects of the General Election, it is necessary to consider other FTA related events that were not related to the election.

4.1 Industry Portfolios

The cumulative abnormal returns on the value-weighted industry portfolios for each event window are presented in Table 3. Most of them are small relative to their standard errors. There are many possible explanations for the low significance levels of these abnormal returns. An important consideration is the definition of "industries" at the 2-digit level. Subsectors of industries may be affected quite differently by the agreement. In addition, to the extent that adjustments to the agreement take place on an intraindustry level, individual firms within a subsector may be affected differently. The Electrical and Electronic Manufacturers Association of Canada, for example, adopted a mixed (yet overall favorable) position with respect to the FTA. According to Litvak (1986), this was due to *diversity in member size, nationality and subsector.*[14] Thus, abnormal returns may reflect the net effect of the winners and losers within the 2-digit category and may be relatively small. Another possible explanation is that the FTA was not anticipated to have a significant economic impact on Canadian manufacturing firms.

Although the cumulative abnormal returns are small relative to their standard errors, their

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[14]Litvak (1986), p. 26.

patterns across events for a number of industries indicate that these abnormal returns do reflect expectations about the consequences of the FTA. Four of the seventeen industries have patterns that indicate a consistent reaction to all six events. The food and beverage, and rubber and plastic cumulative abnormal returns suggest that these industries were anticipated to be hurt by the agreement and the abnormal returns on the primary metal and fabricated metal products portfolios suggest that these industries were expected to benefit from the agreement. In addition, five of the six abnormal returns on the furniture and commercial printing portfolios suggest a negative impact on these industries.

During any given event window, it is likely that other non-FTA related information was learned that had an effect on at least some of the firms or industries in the sample. Thus, the fact that the abnormal returns of a particular industry portfolio do not exhibit a consistent reaction to the FTA does not necessarily imply that investors did not anticipate that the agreement would have an impact on that industry or that this anticipated impact is not reflected in some of the abnormal returns. To determine whether there is information in the set of abnormal returns presented in Table 3, it is necessary to assess the possibility that these abnormal returns were generated by random fluctuations in the stock market rather than by news relating to the FTA. As illustrated in Appendix B, the probability that the cumulative abnormal returns in an industry would have a consistent reaction to all six events due to random fluctuations is equal to $\frac{1}{32}$ or 3.13% [15] and

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[15]This probability is based on the assumption that there is an equal probability of getting a positive or negative abnormal return. If, instead, the assumption is made that it is more likely to get a positive (negative) abnormal return than a negative (positive) abnormal return, then the probability that the abnormal returns will exhibit a consistent reaction to all six events is even lower than 3.13%.

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the probability that the cumulative abnormal returns for at least four out of sixteen industries would have a consistent reaction to all six events is equal to .13%.[16] Thus, the hypothesis that the abnormal returns associated with the FTA events are due to random fluctuations can be rejected at the .0013 level of significance.

The TCARs on the industry portfolios are presented in Table 4 along with their standard errors. Only two of the TCARs are different from zero at any of the conventional levels of significance. Both of these correspond to the lumber industry and are positive and significant at the 5% level of significance. Security of access to the U.S. market is particularly important to the Canadian lumber industry. It has been the frequent subject of trade disputes between the United States and Canada. In 1986, two suits were filed against segments of the Canadian lumber industry: 1) an escape clause suit against the shakes and shingles industry; and 2) a countervailing duty suit against the softwood lumber industry. The first resulted in the imposition of a 35% tariff on imports of Canadian cedar shakes and shingles, and the second resulted in a voluntary export tax on Canadian softwood lumber exports. Although the FTA will not rescind these measures, it will provide Canadian producers greater security in the future.

With the exception of two industries, nonmetallic mineral products and nonelectrical machinery, the signs of the six event TCAR and the three event TCAR are the same. This provides further evidence of a consistent response to news relating to the agreement. Column 3 of Table 4 presents findings by the Royal Commission on the Economic Union and Development Prospects for

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[16]The footwear industry is excluded from this statistical analysis because data is available to calculate cumulative abnormal returns for only the last set of event windows. These abnormal returns, however, do indicate a consistent reaction to the last two events.

Canada (1985) as summarized by Wonnacott (1987). A "P" indicates that the Canadian industry was identified to have an advantage relative to the United States and an "N" indicates that the Canadian industry was identified to be at a disadvantage relative to the United States. With the exception of footwear and electrical equipment, the industries identified by the Royal Commission to be of Canadian strength have positive TCARs and those identified as weak industries relative to the United States have negative TCARs. Thus, the stock market predictions of which industries will benefit or lose from the FTA are largely consistent with the Royal Commission findings of Canadian strength relative to the United States.

In column 4, the positions of industry associations reported by Litvak (1986) are summarized. An "N" indicates that the industry group was opposed to bilateral free trade with the United States, a "P" indicates that the industry group was in favor of free trade, a "P*" indicates that the industry adopted a mixed, but overall favorable position with respect to free trade, and an "M" indicates that the industry position was mixed. The industry associations are listed in Table 5 for reference. It is interesting to note that the industry positions for the nonelectrical machinery and electrical equipment industries are not consistent with the Royal Commission findings. This may reflect the difficulties involved in aggregating firms and subsectors into one industry group. This difficulty is also apparent in the transportation equipment industry. The Royal Commission found two sectors of this industry, urban transit and shipbuilding, to be strong relative to the United States while the association representing another sector of this industry, automotive parts, was opposed to free trade.

For the remaining seven industries for which there is lobbying information, the abnormal returns are consistent with the positions of the respective industry associations. The fact that many of the

abnormal returns "make sense" reinforces the statistical evidence presented above and suggests that the abnormal returns do reflect expectations about the effects of the FTA. In Thompson (1991b) these market predictions are compared to the interindustry adjustments predicted by Computable General Equilibrium models of the FTA.

5 Sensitivity Analysis

5.1 Choice of Market Index

In this section the sensitivity of the results above to the choice of the market index is examined by using the value-weighted index of the securities included in the CRSP database as a proxy for the market index instead of the TSE/Western index. The advantage of using the CRSP index is that it is not likely to be affected by the FTA. The abnormal returns should therefore include the gains due to the marketwide benefits of the agreement as well as the industry-specific effects estimated above. The results are presented in columns 3 and 4 of Table 6. The results from using the TSE/Western index (from Table 4) are listed in columns 1 and 2 for comparison. The abnormal returns using the CRSP index tend to be more positive than those estimated using the TSE/Western index. This is to be expected since the TCARs on the TSE/Western index were positive for both sets of events. In addition, the standard errors tend to be larger. The overall results of the two models are quite consistent with one another. With the exception of transportation equipment, the 6-event TCARs of both procedures have the same sign for all of the industry portfolios and the 3-event TCARs have the same sign for thirteen of the seventeen industry portfolios.

5.2 Length of Event Windows

Sensitivity analysis is also performed with respect to the lengths of the event windows. Abnormal returns are estimated for more narrowly defined event windows than those used above. For the first three events, two-day event windows are used, including the day of the event and the following trading day. Both days are included because it is not clear whether investors learned of the event on the event day or on the following day when the news was released in the newspapers. For the last three events, it is easier to isolate when investors first learned the information. The fourth and sixth events (reaching the agreement, and the release of the public opinion polls just before election day) occurred on Saturdays so that the following Mondays were the first days that the stock market was open after the news was learned. The most dramatic event during event window five is the release of the Gallup Poll results. It can be assumed that these results were not known until their publication in the newspapers.

The results for the "short windows" are presented in columns 5 and 6 of Table 6 using the TSE/Western index as the market index and in columns 7 and 8 using the CRSP index. There are eight industries for which at least one of the TCARs over the short windows using the TSE/Western index is of a different sign than the base case (abnormal returns estimated over the longer windows with the TSE/Western index as the market index) and nine for which at least one of the TCARs over the short windows using the CRSP index is of a different sign than the base case.

There is still a fair amount of consistency, however, across variations of the base case. Five of the industries have TCARs that are consistent across all eight of the variations: textiles, lumber, paper, chemicals and primary metal; and four industries have TCARS that are consistent across seven

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of the eight variations: apparel, rubber and plastic, non-metallic mineral products and fabricated metal products. More confidence can therefore be placed in the implications of the event study results for these nine industries than for the others.

6 Concluding Remarks

This paper employs an event study analysis to estimate the abnormal returns corresponding to news about the Canada-United States Free Trade Agreement on industry portfolios of manufacturing firms in Canada. Only a few of the abnormal returns are statistically significant at conventional levels of significance. The relatively small size of these abnormal returns may reflect the difficulty involved in aggregating firms into portfolios according to 2-digit SIC codes. An alternative interpretation is that the anticipated economic effects of the FTA were small.

Nevertheless, the evidence does suggest that the abnormal returns reflect information concerning the anticipated effects of the agreement. Sensitivity analysis indicates that the abnormal returns are reasonably robust to the choice of the market index and the length of the event window. More confidence can be placed, however, in the results for nine of the industry portfolios than in the results for the remaining eight. In particular, the abnormal returns on the lumber, paper, chemicals, primary metal, and fabricated metal products portfolios suggest that these industries were expected to benefit from the agreement and the abnormal returns on the textiles, apparel, rubber and plastics, and non-metallic mineral products portfolios suggest that these industries were expected to be hurt by the agreement. It will be particularly interesting in the future to compare the actual effects of the FTA to the ex ante expectations reflected in the stock market.

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A List of Event Windows

1. Threat to Deny Fast-Track Authorization: 4/11/86 - 4/16/86

    4/11/86. The Senate Finance Committee announced its intention to deny fast-track authorization of the agreement. According to the *Wall Street Journal* (4/14/86) and the *Globe and Mail* (4/12/86) this news was a surprise. It represented a serious setback.

2. Approval of Fast-Track Procedure: 4/22/86 - 4/28/86

    4/22/86. A close vote was anticipated by the *Globe and Mail* indicating that there was a chance that the Committee would approve the fast-track procedure.

    4/22/86. The Senate Finance Committee put off its vote in response to lobbying on the part of the Reagan Administration.

    4/23/86. The Senate Finance Committee vote was tied so negotiations could begin.

3. Negotiations Halted: 9/23/87 - 9/28/87

    9/23/87. Canada broke off negotiations.

4. Agreement Reached: 10/1/87 - 10/6/87

    9/30/87. It was announced at midnight that the Canadian negotiators would fly to the United States the next day to resume negotiations. (*Globe and Mail* (10/1/87))

    10/3/87. A trade accord was reached within one hour of the midnight deadline.

5. Turner Gains Favor, Agreement at Stake: 10/25/88 - 11/9/88

10/24/88. The first night of the televised debates took place.

10/26/88. The *Globe and Mail* reported that the consensus of journalists and professional observers was that Turner had a clear edge in the first debate.

10/28/88. A poll by Environomics Research Group indicated that Turner was the clear winner of two debates.

10/29/88. An Angus Reid poll was released that indicated that Conservatives and Liberals were neck and neck.

11/1/88. According to a Globe and Mail Environomics poll, the Liberals had pulled ahead. Two-thirds of the pubic opinion polls published in the last 24 hours indicated that the Liberal Party was leading for the first time.

11/7/88. A Gallup poll was released indicating that the Liberals had a ten percentage point lead.

6. Canadian General Election: 11/15/88 - 11/24/88

11/16/88. The *Globe and Mail* reported unconfirmed rumors of increasing Conservative support.

11/19/88. Three national public opinion polls were released that indicated a surge of support for Mulroney and the Conservative Party.

11/21/88. Election Day.

B Statistical Analysis of Abnormal Returns

I. *The probability that cumulative abnormal returns will represent a consistent reaction to all six events due to random fluctuations.*

If the abnormal returns are due solely to random fluctuations in the stock market, then each event may be treated as a Bernoulli trial. There are two possible outcomes for each event, a positive cumulative abnormal return and a negative cumulative abnormal return. Under the null hypothesis of random fluctuations it is assumed that there is an equal probability of getting a positive return or a negative return. With six events, each with two possible outcomes, the total number of possible sequences of positive and negative CARs is $2^6 = 64$. The six events follow an alternating pattern with respect to their influence on the perceived probability of FTA implementation; an event that is unfavorable to the agreement is followed by an event that is favorable to the agreement. There are two ways in which the pattern of cumulative abnormal returns can represent a consistent response to the events, either $+ - + - + -$, or $- + - + - +$. Thus, the probability that the cumulative abnormal returns of an industry will represent a consistent response to the events that occurred is equal to $\frac{1}{32}$.

II. *The probability that four or more of the sixteen industries will have consistent reactions to all six events due to random fluctuations.*

Under the null hypothesis of random fluctuations, the patterns of abnormal returns on the sixteen industry portfolios can be treated as a sequence of sixteen independent Bernoulli trials.[17]

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[17]Due to contemporaneous correlation of stock market returns, the cumulative abnormal returns are not actually independent across industries. This correlation is not likely to affect the results, however, since they are based on six different events. It is difficult to imagine, for example, that there were non-FTA related shocks during all six event windows that caused the abnormal returns on the primary metal and fabricated metal products industries to have the same sign.

There are two possible outcomes for each trial: "success", which is defined to be an alternating pattern of positive and negative returns; and "failure", which is defined to be any other pattern of returns. The probability of getting at least four successes in sixteen trials is equal to one minus the cumulative probability of three or less successes.

$$Prob(x \geq 4) = 1 - Prob(x = 0) - Prob(x = 1) - Prob(x = 2) - Prob(x = 3)$$

where x equals the number of successes. This probability can be determined by using the binomial distribution.

$$Prob(x \geq 4) \; = \; 1 - \binom{16}{0} \left(\frac{1}{32}\right)^0 \left(\frac{31}{32}\right)^{16} - \binom{16}{1} \left(\frac{1}{32}\right)^1 \left(\frac{31}{32}\right)^{15}$$

$$- \binom{16}{2} \left(\frac{1}{32}\right)^2 \left(\frac{31}{32}\right)^{14} - \binom{16}{3} \left(\frac{1}{32}\right)^3 \left(\frac{31}{32}\right)^{13} = .0013.$$

Table.1: Number of Firms in Portfolios

INDUSTRY	Events 1 & 2	Events 3 & 4	Events 5 & 6
FOOD & BEVERAGES	19	19	22
TOBACCO	3	3	3
TEXTILES	5	6	7
APPAREL	0	3	7
LUMBER	4	8	9
FURNITURE	2	3	3
PAPER	13	14	14
PRINTING	4	4	4
CHEMICALS	7	8	9
RUBBER & PLASTIC	3	4	5
FOOTWEAR	0	0	1
NONMETALLIC MINERALS	6	6	7
PRIMARY METAL	12	15	13
FABRICATED METAL	10	13	11
NONELECTRICAL MACHINE	10	8	13
ELECTRICAL MACHINERY	24	35	32
TRANSPORT EQUIPMENT	12	14	13

Table 2: Cumulative Abnormal Returns on Indexes of Canadian Firms

DATE	TSE 300		TSE/WESTERN INDEX	
	ABNORMAL RETURN	STANDARD ERROR	ABNORMAL RETURN	STANDARD ERROR
EVENT #1	.0045	.0094	.0050	.0078
EVENT #2	.0051	.0104	.0053	.0087
EVENT #3	.0029	.0100	.0027	.0087
EVENT #4	-.0095	.0100	-.0041	.0087
EVENT #5	-.0217	.0326	-.0092	.0295
EVENT #6	.0034	.0247	-.0020	.0223
TCAR 6 events	.0133	.0454	.0007	.0407
TCAR 3 events	.0156	.0421	.0031	.0380

Table 3: Cumulative Abnormal Returns on Industry Portfolios

INDUSTRY	EVENT #1	EVENT #2	EVENT #3	EVENT #4	EVENT #5	EVENT #6
FOOD & BEVERAGES	.0013 (.0097)	-.0046 (.0108)	.0020 (.0109)	-.0158 (.0109)	.0033 (.0211)	-.0023 (.0171)
TOBACCO	.0615 (.0300)	-.0002 (.0334)	-.0270 (.0231)	-.0366 (.0231)	-.0259 (.0408)	.0087 (.0331)
TEXTILES	.0156 (.0277)	.0063 (.0309)	-.0052 (.0229)	-.0114 (.0229)	-.0078 (.0464)	-.0208 (.0376)
APPAREL	NA	NA	.0145 (.0374)	-.0365 (.0374)	-.0113 (.0541)	-.0027 (.0441)
LUMBER	-.0529 (.0307)	-.0434 (.0342)	-.0434 (.0272)	.0564 (.0273)	-.0566 (.0323)	-.0028 (.0264)
FURNITURE	-.0274 (.0561)	-.0168 (.0619)	.0391 (.0371)	-.0055 (.0371)	.0466 (.0626)	-.0191 (.0511)
PAPER & PAPER PRODUCTS	.0030 (.0202)	-.0064 (.0228)	-.0057 (.0217)	.0709 (.0217)	.0311 (.0308)	-.0114 (.0250)
PRINTING & BUSINESS FORMS	.0031 (.0222)	-.0157 (.0248)	.0115 (.0363)	-.0340 (.0363)	-.0208 (.0447)	-.0382 (.0365)
CHEMICALS	.0081 (.0154)	-.0093 (.0172)	-.0116 (.0155)	-.0160 (.0155)	-.0483 (.0376)	-.0090 (.0305)
RUBBER & PLASTIC	.0367 (.0202)	-.0330 (.0222)	.0009 (.0292)	-.0017 (.0292)	.0028 (.0703)	-.0075 (.0578)
FOOTWEAR	NA	NA	NA	NA	-.0988 (.1056)	.0573 (.0862)
NONMETALLIC MINERAL PRODUCTS	.0675 (.0161)	-.0141 (.0180)	-.0082 (.0164)	.0105 (.0164)	.0267 (.0468)	.0169 (.0379)
PRIMARY METAL	-.0202 (.0173)	.0017 (.0193)	-.0098 (.0215)	.0163 (.0215)	-.0098 (.0384)	.0105 (.0311)
FABRICATED METAL PRODUCTS	-.0102 (.0188)	.0054 (.0210)	-.0078 (.0190)	.0056 (.0190)	-.0412 (.0487)	.0054 (.0394)
NONELECTRICAL MACHINERY	-.0431 (.0300)	.0816 (.0335)	.0153 (.0422)	.0183 (.0422)	.0071 (.0538)	-.0361 (.0436)
ELECTRICAL EQUIPMENT	.0090 (.0217)	.0578 (.0242)	.0080 (.0250)	-.0414 (.0251)	-.0693 (.0535)	-.0248 (.0433)
TRANSPORTATION EQUIPMENT	.0021 (.0174)	-.0038 (.0194)	.0093 (.0153)	-.0145 (.0153)	-.0201 (.0360)	.0255 (.0291)

(Standard errors are in parentheses.)

Table 4: Total Cumulative Abnormal Returns on Industry Portfolios

INDUSTRY	TCAR 6 EVENTS	TCAR 3 EVENTS	ROYAL COMMISSION FINDINGS	INDUSTRY POSITIONS
FOOD & BEVERAGES	-.0294 .0339	-.0215 .0293		N
TOBACCO	-.0367 (.0754)	-.0019 (.0574)		
TEXTILES	-.0286 (.0785)	-.0244 (.0640)	N	N
APPAREL	-.0425 (.0869)	-.0280 (.0792)	N	
LUMBER	.1632** (.0726)	.1102** (.0498)	P	
FURNITURE	-.0998 (.1283)	-.0712 (.0889)	N	N
PAPER	.0247 (.0538)	.0283 (.0452)	P	P*
PRINTING & BUSINESS FORMS	-.0816 (.0900)	-.0514 (.0682)		N
CHEMICALS	.0175 (.0571)	.0233 (.0509)		M
RUBBER & PLASTIC	-.0826 (.1043)	-.0120 (.0955)		
Rubber Tires			N	N
Plastic Products				N
FOOTWEAR	NA	.1562 (.1363)	N	
NONMETALLIC MINERAL PRODUCTS	-.0729 (.0678)	.0006 (.0624)		
PRIMARY METAL	.0684 (.0635)	.0367 (.0539)		
FABRICATED METAL PRODUCTS	.0756 (.0726)	.0522 (.0655)		
NONELECTRICAL MACHINERY	.0844 (.1019)	-.0249 (.0811)	N	P
ELECTRICAL EQUIPMENT	.0439 (.0840)	.0031 (.0733)	N	P*
TRANSPORTATION EQUIPMENT	.0159 (.0565)	.0311 (.0487)		
Automotive Parts				N
Shipbuilding			P	
Urban Transit			P	

(Standard errors are in parentheses.)
** Significant at the 5% level.

Table 5: Industry Associations

INDUSTRY	ASSOCIATIONS
FOOD & BEVERAGES	Grocery Products Manufacturers of Canada Brewer's Association of Canada
TEXTILES	Canadian Textiles Institute Canadian Carpet Institute
FURNITURE	Canadian Council of Furniture Manufacturers
PAPER	Canadian Pulp and Paper Association
PRINTING	Graphic Arts Industry Association
CHEMICALS	Canadian Chemical Producers Association
RUBBER & PLASTIC	The Rubber Association of Canada The Society of the Plastics Industry of Canada
NONELECTRICAL MACHINERY	Machinery Equipment Manufacturers' Association of Canada
ELECTRICAL MACHINERY	Electrical and Electronic Manufacturers Association Canadian Business Equipment Manufacturers Association
TRANSPORT EQUIPMENT	Automotive Parts Manufacturers' Association

Table 6: Sensitivity Analysis

INDUSTRY	LONG WINDOWS				SHORT WINDOWS			
	TSE INDEX		CRSP INDEX		TSE INDEX		CRSP INDEX	
	TCAR 6 EVENTS	TCAR 3 EVENTS	TCAR 6 EVENTS	TCAR 3 EVENTS	TCAR 6 EVENTS	TCAR 3 EVENTS	TCAR 6 EVENTS	TCAR 3 EVENTS
FOOD & BEVERAGES	-.0294 (.0339)	-.0215 (.0293)	-.0232 (.0406)	-.0180 (.0356)	-.0168 (.0159)	-.0089 (.0101)	.0006 (.0179)	.0124 (.0121)
TOBACCO	-.0367 (.0754)	-.0019 (.0574)	-.0179 (.0819)	.0074 (.0633)	.0428 (.0395)	.0177 (.0200)	.0642 (.0413)	.0414* (.0220)
TEXTILES	-.0286 (.0785)	-.0244 (.0640)	-.0175 (.0852)	-.0142 (.0704)	-.0337 (.0387)	-.0290 (.0218)	-.0192 (.0402)	-.0116 (.0240)
APPAREL	-.0425 (.0869)	-.0280 (.0792)	-.0212 (.1152)	-.0062 (.1089)	-.0306 (.0413)	-.0118 (.0317)	-.0040 (.0459)	.0188 (.0375)
LUMBER	.1632** (.0726)	.1102** (.0498)	.1709* (.0995)	.1157 (.0836)	.0635 (.0419)	.0197 (.0214)	.0894* (.0462)	.0516* (.0287)
FURNITURE	-.0998 (.1283)	-.0712 (.0889)	-.0755 (.1577)	-.0291 (.1130)	-.0056 (.0813)	.0135 (.0364)	.0069 (.0829)	.0301 (.0387)
PAPER	.0247 (.0538)	.0283 (.0452)	.0212 (.0657)	.0257 (.0556)	.0322 (.0269)	.0160 (.0154)	.0505* (.0305)	.0437** (.0194)
PRINTING & BUSINESS FORMS	-.0816 (.0900)	-.0514 (.0682)	-.0559 (.0918)	-.0279 (.0771)	-.0088 (.0442)	.0096 (.0285)	-.0041 (.0442)	.0175 (.0283)
CHEMICALS	.0175 (.0571)	.0233 (.0509)	.0160 (.0644)	.0255 (.0567)	.0020 (.0253)	.0117 (.0169)	.0185 (.0283)	.0345* (.0193)
RUBBER & PLASTIC	-.0826 (.1043)	-.0120 (.0955)	-.0465 (.1676)	.0260 (.1592)	-.1151** (.0577)	-.0717 (.0456)	-.0845 (.0633)	-.0379 (.0524)
FOOTWEAR	NA	.1562 (.1363)	NA	.1469 (.1780)	NA	-.0440 (.0524)	NA	-.0185 (.0568)
NONMETALLIC MINERAL PRODUCTS	-.0729 (.0678)	.0006 (.0624)	-.0802 (.074)	-.0061 (.0676)	-.0360 (.0284)	-.0369* (.0204)	-.0143 (.0302)	-.0121 (.0224)
PRIMARY METAL	.0684 (.0635)	.0367 (.0539)	.0797 (.0715)	.0443 (.0629)	.0036 (.0283)	.0135 (.0180)	.0306 (.0315)	.0471** (.0214)
FABRICATED METAL PRODUCTS	.0756 (.0726)	.0522 (.0655)	.0683 (.0783)	.0475 (.0692)	.0143 (.0315)	-.0032 (.0216)	.0287 (.0339)	.0160 (.0233)
NONELECTRICAL MACHINERY	.0844 (.1019)	-.0249 (.0811)	.1003 (.1050)	-.0095 (.0847)	.0690 (.0518)	-.0313 (.0301)	.0901* (.0526)	-.0053 (.0313)
ELECTRICAL EQUIPMENT	.0439 (.0840)	.0031 (.0733)	.0566 (.0641)	-.0189 (.0541)	-.0073 (.0307)	-.0275 (.0199)	.0143 (.0298)	-.0008 (.0188)
TRANSPORTATION EQUIPMENT	.0159 (.0565)	.0311 (.0487)	-.0195 (.0608)	.0261 (.0525)	-.0182 (.0261)	.0104 (.0163)	-.0046 (.0273)	.0272 (.0179)

(Standard errors are in parentheses.)
* Significant at the 10% level of significance.
**Significant at the 5% level of significance.