The Effects of the Uruguay Round:

Empirical Evidence from US Industry

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A version of this paper is appearing at the Contemporary Economic Policy
(Contemporary Economic Policy, Vol. 18 No. 1, January 2000)

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ABSTRACT

This paper uses an event study to evaluate the anticipated results of the Uruguay Round on U.S. industry. While CGE models also have been utilized to evaluate the results of the Uruguay Round, they rely heavily on subjective assessments of the modelers. In contrast, an event study is based on the assessments of many investors. The market assessment implicitly incorporates effects that are difficult to model. We find that US industries with comparative advantage (disadvantage) experience positive (negative) stock price reactions, reflecting an increase (a decrease) in the industry trade and investment opportunities as well as an increased (decreased) return to existing tangible and intangible assets. Yet, for the market as a whole the variation in stock prices does not differ significantly from zero. Moreover, the economic magnitude of industry gains and losses is rather small. These results are broadly consistent with some known CGE assessments and the skeptical attitude that the real impact of the Uruguay Round Agreement remains uncertain. The results raise the question of what causes the lack of impact of such a politically significant event.

JLE classification: F1, F2

Key words: Uruguay Round, event study

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"*...[The GATT]... could add as much as one hundred to two hundred billion dollars to the United States economy every year."* (President Clinton, *MacNeil/Lehrer NewsHour*, Transcript #4819, December 14, 1993)

"*...[The GATT]... could actually bring a net increase in objectionable practices and swell the U.S. trade deficit by $10-30 billion at the cost of thousands of jobs.*" (Clyde Prestowitz, President, Economic Strategy Institute, *Washington Post*, November 28, 1993)

"*The [Uruguay] Round itself, at least in terms of economic effects, may not make a big difference.*" (Deardorff, 1994a, p.1)

1. Introduction

The Uruguay Round of trade negotiations that concluded in December 1993 represents the eighth round of multilateral trade negotiations that has occurred over the past 50 years. The breadth of consensus reached by over 150 nations was previously thought unattainable. The Uruguay Round of the General Agreement on Tariffs and Trade (GATT) covers a much broader range of transactions than was the case in prior agreements. While earlier rounds focused primarily on control and reduction of tariff barriers, the Uruguay Round disciplines many non-tariff barriers. Additionally, trade in intellectual property and service is now governed by GATT principles. Other major developments include the establishment of the World Trade Organization (WTO), a body that will monitor compliance and provide a forum for future multilateral negotiations, and the development of a stronger dispute resolution mechanism for the settlement of trade-related disputes.

What will be the impact of this ambitious trade liberalization agreement? Understandably, politicians trumpet their achievement in the Uruguay Round Agreement, and they typically claim that it will generate hundreds of billions of dollars of additional income per year. Equally understandably,

some industry leaders argue that the Uruguay Round Agreement will result in a flood of imports that will seriously injure US industry, displace thousands of workers and send many companies into bankruptcy. Economists offer less dramatic assessments. Many economists see the WTO as primarily establishing a framework for future negotiations (e.g. Deardorff, 1994b, Whalley 1993) and the current effects are likely to be quite small.[1] A middle range result reported by Nguyen, Perroni and Wigle (1993) projects a gain to the United States of $36 billion, or 0.8 percent of GDP, with over 80 percent of those benefits attributable to reduced subsidization of agriculture and to liberalization in textiles and apparel.

The projections of politicians and industry leaders not surprisingly may be biased by the personal stake of those making the projections. Economists, too, inevitably exercise personal judgements in assessing the impact of the Uruguay Round. This paper investigate how investors, people who instantaneously put their money behind their opinion, assess the result of the Uruguay Round Agreement. Specifically, we examine how the US stock prices in 198 different 3-digit SIC industries reacted to news of the successful conclusion of the Uruguay Round. We find industry stock price reactions are positive for U.S. industries that are net exporters or technology intensive, i.e., characteristics of industries with a comparative advantage internationally (Maskus 1991, Deardorff 1984). Overall, the net change in US capital value is insignificantly negative and the magnitude of the capital value created and destroyed by the Uruguay Round is rather small. Our results are broadly consistent with the known marginal assessments based on CGE models and are consistent with the attitude that the real impact of the Uruguay Round Agreement remains uncertain, pending further efforts to liberalize trade and investment multilaterally.

The remainder of the paper is organized as follows. Section 2 briefly discusses the content and achievements of the Uruguay Round negotiations. A review of previous assessments of the Uruguay

Round and simulation-based conjectures of the potential effects are contained in Section 3. Section 4 explains how an event study of the stock market's reaction to the Uruguay Round provides another estimate of its effect and relates the observed outcomes to international trade theory. Section 5 covers the data and methodology used. Results follow in Section 6. The paper concludes with a brief discussion of the results and their implications.

2. Content of the Uruguay Round

The provisions agreed to by the members of the newly-created WTO are contained in the *Final Act Embodying the Results of the Uruguay Round of Multilateral Trade Negotiations* (the Uruguay Round Agreement). This agreement makes several notable changes to and improvements upon the prior GATT trading system. Some of the provisions deal with issues addressed in prior GATT negotiations, such as tariffs, safeguards, quotas, antidumping duties, countervailing duties, subsidies and dispute resolution. Others introduce multilateral discipline into areas previously outside of effective GATT control, such as agriculture, textiles, services, intellectual property, and foreign direct investment. These changes are summarized in Table 1 and are discussed below.[2]

[Table 1 about here.]

Changes that represent improvements in areas addressed by prior GATT negotiations are as follows:

(i) further reductions in tariffs[3];

(ii) more explicit rules on subsidies (e.g. sorting subsidies into prohibited and allowable categories)[4];

(iii) greater standardization and transparency of tariff and anti-dumping rules[5]; and

(iv) conversion of existing non-tariff barriers to tariffs and phasing out agreements like the Multifibre Agreement.

Of potentially greater long-term consequence is the inclusion of new areas of trade within the WTO. Given the growing importance of trade-related investment, intellectual property, and services, inclusion of these new areas may be quite significant. While initial steps taken have been small, important precedents have been established. Improvements made to these areas, along with limitations, are as follows:

(i) With respect to intellectual property rights, minimum standards for protection and enforcement have been established. However, the phase-in period is long and innovations currently in the development pipeline are not included.

(ii) With respect to trade in services, the newly established General Agreement on Trade in Services (GATS) requires members to provide "most favored nation" and "national treatment" status to all member nations when countries undertake specific market access commitments, but no standard for barriers to trade on services has been set. In 1997 agreements were reached covering telecommunications and finance. Ongoing negotiations will be necessary to extend GATS procedures to other important sectors.

(iii) With respect to liberalization of foreign direct investment, new rules prohibiting local content requirements[6] and various trade and foreign exchange balancing requirements have been established. Trade-related issues of export performance requirements were not addressed, however, nor were more general issues of technology transfer requirements or limitations on equity ownership considered. There will be further negotiations on foreign investment policies.

The Uruguay Round has also made a number of administrative improvements as follows:

(i). The creation of the World Trade Organization (WTO) provides a framework to administer this agreement as well as to ensure the continuation of the liberalization process. All WTO members must adhere to the broad range of all Uruguay Round Agreements and new agreements, unlike in the past when countries could pick and choose which agreements to sign.

(ii). The establishment of a dispute settlement mechanism with much greater likelihood that panel findings will be adopted and implemented.[7]

(iii). The creation of the Trade Policy Review Mechanism (TPRM) whose task is to examine national trade policies and other economic policies that affect the international trading environment. Member nations are required to register particular subsidies and standards with the TPRM. This registry will increase the transparency of existing international trade barriers, a first step in their eventual removal.

The changes described above represent significant and radical developments, which may lead one to conclude that the economic effects of the Uruguay Round will be substantial. However, for a variety of reasons, that is not necessarily the case.

First, even with the Agreement, countries must actually implement these agreements. At the December 1996 WTO ministerial meeting in Singapore, few members had registered current practices as required by the Uruguay Round Agreement, an initial indication that general compliance levels are low. Second, transitional provisions found in every agreement within the GATT will significantly delay the potential economic effects of the liberalization. For example, the agreement on textiles and clothing will take ten years to phase out the complicated regime of quotas that govern current trade in textiles

and clothing, with the most distorting restrictions not lifted until the end of the period. These long phase-in periods allow protectionists significant time to create new ways to protect their industries.

More generally, the current agreement does not forbid the development of new trade and investment barriers via subsidies and taxes disguised as regional development and income re-distribution policies (for an excellent discussion, see Slemrod 1995). In general, because many transparent trade barriers are now prohibited, members seeking to promote their exports and restrict imports may develop new policies that are not specifically prohibited by the GATT. These non-tariff barriers have the potential to maintain distorted patterns of trade.

The upshot, therefore, is that it is unclear what the impact of the Uruguay Round Agreement will be, if any.

3. Assessments of the Uruguay Round Based on Simulation Models

Prior to the conclusion of the Uruguay Round, several economists used computable general equilibrium models (CGE) to simulate its potential economic benefits and costs. An early analysis by Brown et al (1996) predicted that the economic effects would not be significant given the low level of existing tariff barriers. As more details of the Agreement became available, other researchers incorporated them into more comprehensive analyses. These attempts undoubtedly provide more useful concrete guideline on the impact of the Uruguay Round Agreement than the rhetoric of politicians and extremists.

Using CGE models to simulate the impact of the Uruguay Round Agreement is a challenging job. A common feature of all CGE models is that they require two specific types of information: (i) an

accurate characterization of the new international trade and investment environment that the Uruguay Round agreement creates; and (ii) an appropriate representation of all the long- and short-run economic behavioral functions in all product and factor markets. Obtaining and adopting this information is a daunting exercise.

First, the changes associated with the Uruguay Round Agreement are complicated and often qualitative in nature. Even if one fully understands the formal language of the Uruguay Round Agreement, it is difficult to estimate the degree to which member nations will implement the new trade measures or to calculate the effects of new trading rules and procedures that cannot be easily reduced to a tariff-equivalent representation.

Second, economic restructuring due to the Uruguay Round Agreement will cause assets to be relocated across industries and nations. Incorporating these adjustment paths into the CGE models is non-trivial, as the movement of physical capital and labor erodes initially large differences in industry-specific returns.

Third, because the Uruguay Round frees international direct investment to a substantial extent and affords greater international property rights protection, these expanded opportunities will lead to considerable international reallocation of knowledge capital. National comparative advantage may well shift, as human capital, technology and other intangible factors of production move across borders. Multinational corporations (MNCs), as conduits for transferring tangible and intangible factors of production (Caves 1974), will likely expedite this shifting of comparative advantage. U.S. MNCs will benefit even if production in the United States does not rise much.

Fourth, in addition to the basic trade and investment responses described above, the Uruguay Round Agreement may stimulate the development of new products or production processes. To the

extent that greater efficiency and rising national output allow additional savings and accumulation of capital, further benefits arise (Baldwin 1992). The complexity of modeling these various dynamic effects, however, means that CGE modellers have tended to focus on some of these effects but to ignore others; see the collection of papers in Martin and Winters (1995), which demonstrate alternative choices made.

The economic literature offers imprecise guidance for model calibration when representations of product innovations, the role of industry structure, factor accumulation, reductions in x-inefficiency, the transfer of intangible assets, and technological improvements are required. Given the efforts of CGE modelers to incorporate at least some aspects of these complex relationships in their analysis, we may be surprised to find that Brown, et. al. (1993) and Nguyen, et. al. (1993) report a result quite consistent with partial-equilibrium analysis: U.S. industries expand the most where foreign tariff concessions are the greatest. These industries tend to be high-technology manufactures and capital goods. Interestingly, we find a similar verdict using another approach that we describe in the next section.

4. Assessment of the Uruguay Round Based on Stock Market Reaction

The stock market's assessment of the effects of the Uruguay Round agreement has not yet been explored. By measuring the change in firm value as a result of the Uruguay Round, we can infer the assessment made by investors. The value of any firm on the stock market is based on the net present value of net cash flows generated by that firm's tangible and intangible assets. Firm value also includes an investment option component that measures the value of future or potential investment by the firm (Ingersoll and Ross 1992). It follows that firm value will vary according to the expected change in net

cash flow and investment opportunities caused by the Uruguay Round Agreement. In a reasonably efficient stock market, these expectations will be manifested in the stock price reactions to the announcement of the conclusion of the Uruguay Round negotiations.

We therefore conduct an event study on how US stocks react to the announcement of the conclusion of the Uruguay Round. The use of event studies to study international trade issues is gradually becoming more common, e.g. Grossman and Levinsohn (1989), Hartigan *et al.* (1986), Brander (1991) and Lenway *et al.* (1996). Thompson (1993, 1994) applies the event study methodology to investigate the impact of the 1987 U.S.-Canada Free Trade Agreement on Canadian firms and industries. She finds that firm-level stock price reactions to the agreement are positively related to natural resource intensity and negatively related to plant scale disadvantage. At the industry level and for the market as a whole, the Canadian stock price reactions are insignificant. We choose to analyze the U.S. response, because the U.S. stock market is thick and efficient, and data are readily available. We believe, however, that using other countries' stock data will generate interesting results, too, because they tend to be more dependent on trade than the U.S. economy.

While investors, like CGE modelers, also must make subjective assessments of the agreements cited above as to the likelihood and actual forms of implementation as well as the economic effects, this assessment will be based on the views of many investors rather than a single model builder. On the other hand, the market assessment focuses on firm value and admittedly does not give information in many other areas, such as changes in output and employment, which CGE modelers often address.

We examine two pieces of empirical information: (i) the overall market reaction; and (ii) the relationship between an individual industry's stock price reaction and the industry's characteristics. The stock price reaction, as it is used in this paper, is the cumulative abnormal return on the stock.

Empirically, it is the difference between an industry's size-weighted average return and the market return summed over the trading days surrounding the announcement of the successful conclusion of the Uruguay Round negotiations.

In terms of the effect of the Uruguay Round on the US stock market, there are several potential scenarios that could arise as a result. First, the investment community might deem the Uruguay Round Agreement a non-event leading to no substantive long-run or short-run changes to the international trade and investment environment affecting US industries. Both the overall stock market reaction and individual industry stock price reactions would then be zero.

Second, the investment community might expect the Uruguay Round agreement to liberalize trade and investment considerably so that national welfare rises. The benefits are likely to be greatest for factors used intensively in industries currently penalized by a more restrictive trade regime. For the United States that suggests that investors should expect returns to rise most in industries that use tangible and intangible capital intensively, assuming that the US is a relatively capital-abundant country. Generally, the overall market reaction should be positive while individual industry stock price reactions would be positive for industries expected to benefit from and negative for industries expected to be adversely affected by the liberalization of trade and investment in the Uruguay Round.

In the third possible scenario, the investment community might expect the Uruguay Round Agreement to fail to generate significant overall long-run changes but to generate offsetting industry-specific changes. In this case, the overall market reaction would be weak while industry stock price reactions would behave as described in the second scenario.

For the second and third scenarios, it is necessary to predict how the Uruguay Round Agreement affect different industries. To predict which industries will experience a positive stock price

reaction from multilateral trade liberalization, first recognize that the change in the value of capital in an industry is the sum of changes to the value of the firms in the industry. Firm value is the discounted present value of the projected net cash flow generated by its existing tangible and intangible assets plus the value of future investment opportunities. In each period, cash flow is the difference between revenue (output multiplied by price) and input costs (including raw materials, intermediate inputs and labor). The discount factor is the cost of capital, which is the risk free return plus the risk premium associated with the firm's economic activities.

While changes in trade and investment barriers will change the input and labor prices, traditional trade theory (e.g. Mussa 1974) suggests that the change in cashflow should be in the same direction as the change in output price. As we expect trade and investment liberalization to decrease the price of import-competing goods relative to exported goods, we expect cash flow to rise for US export industries and to decline for import-competing industries. In addition, trade and investment liberalization should decrease the risk premium for industries that benefit from greater and hence more diversified market access (i.e. exporting sectors) and similarly increase the premium for industries that will be adversely affected by greater market access (i.e. import competing sectors).

Finally, the value of potential investment opportunities grows in exporting industries and shrinks in import-competing industries. Therefore, the abnormal stock price reactions should be positive in exporting (comparative advantage) industries and negative in import-competing (comparative disadvantage) industries where the Uruguay Round Agreement liberalizes trade.

Predicted effects of the Uruguay Round on firm value as described above assume that investors expect trade liberalization to occur. We cannot specify with certainty how investors form their expectations. Our proxy for these expectations is based on factors identified in political economy

studies and as suggested by international trade theory. U.S. trade barriers tend to be greater in industries with low wages, a higher proportion of unskilled workers, and a high labor/output ratio (Baldwin 1985, p.165). These also are industries in which the United States has a comparative disadvantage, as suggested by the classic Heckscher-Ohlin factor endowments theory of trade: a country will import goods that use relatively scarce factors intensively, and export goods that use relatively abundant factors intensively. The converse also applies: if foreign countries have imposed trade barriers to protect industries using their relatively scarce factors, US industries with comparative advantage will gain from multilateral trade liberalization.

Identification of industries that potentially will gain from trade liberalization need not be based on factor endowments alone, though, because in some industries factor endowments may not be the most important explanation of current trade patterns. For example, some countries may impose barriers in industries that do not utilize their scarce factors intensively. Countries may pursue such a strategy to achieve economies of scale in serving a captive home market and subsequently promoting exports (Krugman 1987). To the extent that such strategic trade policy has been used by other countries to target industries where the United States has significant comparative advantage, then US producers in those industries may benefit from general trade liberalization.

Our proxies to capture investor expectations are based on determinants of U.S. comparative advantage. Past studies of US trade patterns suggest that U.S. exports are highest in industries that require research and development and skilled labor intensively (see Baldwin 1971 and Deardorff 1984 for a summary of these results). Factors of production used intensively in US import-competing industries are unskilled labor and capital, although capital often is positively related to exports when trade in natural resource products is excluded. A more recent multi-country study by Maskus (1991)

confirms earlier results suggesting a positive correlation between US exports and the share of value added attributable to physical and human capital.

A more direct measure of comparative advantage is the net export position of an industry, which we also use in the empirical analysis. In any event, if successful export industries have led foreign governments to raise trade barriers against them, then industries with those characteristics stand to gain from trade liberalization. In addition, these characteristics are useful in identifying US industries that have special expertise and technical know how that they may not exploit through international trade in goods. Yet, these industries are likely to benefit from many of the rule-based agreements in services, intellectual property and direct investment. Of course, the benefits are more certain and immediate for some industries while for others they may be delayed considerably, depending upon the implementation of the Uruguay Round Agreement.

5. Data & Methodology

Selection of an appropriate date is critical to an event study. There are several dates relevant to the passage and implementation of the Uruguay Round. These dates are set out in Table 2. They include the conclusion of the Uruguay Round and passage of the bill ratifying US participation in the WTO by the US House of Representatives and Senate. We selected December 15, 1993, as the appropriate date for this event study.

[Table 2 about here]

The Uruguay Round Agreement was signed just before midnight on December 15, 1993 in Marrakech, Morocco, about 6:00 pm EST in the US. It was uncertain up to that day whether

consensual agreement would be reached by the time President Clinton's fast track authority expired on December 15. If consensus was not reached, the President would have to return to the US Congress for an extension of authority to sign the agreement, which would have considerably delayed the conclusion of the Uruguay Round. It is unlikely that the Uruguay Round would proceed without US participation, as without it, the value of the WTO would be significantly reduced. The fact that the agreement was not signed until late on December 15, 1993, indicates that the successful conclusion of the agreement was highly uncertain until the last minute. Therefore, we believe that the announcement of the conclusion of the Uruguay Round on the evening of December 15th 1993, had news content. This assertion, of course, does not preclude the possibility that many investors had bet on the successful conclusion of the Uruguay Round negotiations earlier on December 15th, or even on December 14th, 1993. In contrast, we do not believe that passage of the ratification bill by the House of Representatives and Senate had strong news content. Passage by the House of Representatives was virtually assured. Some debate surrounded the passage by the Senate. However, President Clinton's lobbying efforts in the few days before the vote ensured passage.

We expect the stock market to have incorporated information on the conclusion of the Uruguay Round, manifested in changes to stock prices, around December 15 and 16. A three day event window is employed in the analysis below (t_{-1}, t_0, t_{+1}). We use December 15, 1993 as the event day, t_0. We also repeat our analysis using December 16, 1993 as the event day. The results are qualitatively similar. Results for both event days are discussed in Section 6.

The empirical specification used to test our assertions contained in Section 4 is as follows:[8]

(1) $CAR_i = \beta X_i$

where CAR_i is the cumulative abnormal return for industry *i*; defined as[9]

$$CAR_i = \sum_{t=-1}^{+1}\left[\left(\sum_j\left(R_{ij}\times\frac{V_{ij}}{\sum_j V_{ij}}\right)\right)-MR\right]$$

t is the day surrounding the event date (event date = 0);

j is the firm within industry *i*;

R_{ij} is the return for firm *j* in industry *i*;

V_{ij} is the value of firm *j* in industry *i* (value = # shares outstanding x share price); and

MR is the value weighted market return (including dividends) from the CRSP daily cum dividend series.

X_i is a vector of independent variables capturing industry characteristics

Following the discussion in Section 4, our proxies for industry characteristics (X_i), which are intended to reflect relative factor intensities or potential comparative advantage, are as follows:

$CAPITAL_i$ is the difference between the ratio of net property, plant and equipment (tangible capital) per employee for industry *i* and the corresponding US economy wide ratio, defined as:

$$CAPITAL_i = \left(\frac{EQUIPMENT_i}{LABOR_i}\right)-\left(\frac{\sum_i EQUIPMENT_i}{\sum_i LABOR_i}\right) \quad \text{(1-b)}$$

$TECHNOLOGY_i$ is the difference between the research and development spending per employee for industry *i* and the corresponding US economy wide ratio defined as[10]:

$$TECHNOLOGY_i = \left(\frac{R\&D_i}{LABOR_i}\right)-\left(\frac{\sum_i R\&D_i}{\sum_i LABOR_i}\right) \quad \text{(1-c)}$$

$NEXPORTS_i$ is (exports - imports)/total shipment in industry i.

$HCAPITAL_i$ is a proxy for human capital, represented as (total payroll - wages to production workers)$_i$ / value added$_i$ (denoted as HCAPITAL1i) and also as (total compensation - number of employees times the minimum wage)$_i$ / value added$_i$ (denoted as HCAPITAL2i). The measure for industry i is expressed relative to the economy-wide average.

Our sample consists of US industries at the 3-digit SIC level of aggregation. We use a 3-digit SIC level of aggregation for several reasons. First, we want a sizable number of industry observations in order to have sufficient degrees of freedom. Further, the level of aggregation must be such that the identified industry characteristics apply to most sub-industries included in each aggregated industry sector. Hence, the 1- and 2- digit SIC levels of aggregation are not suitable. However, we also want to avoid an overly detailed industry classification. Our industry characteristic variables ($TECHNOLOGY_i$ and $CAPITAL_i$) are constructed using firm level data, but firms often produce products categorized in more than one 4-digit industry. Misclassification of a firm is less likely at the 3-digit level than at the 4-digit level.

Various industries are specifically excluded from the analysis. Industries excluded are non-tradable industries such as real estate, automotive service stations, personal services, and utilities services as well as non-classifiable establishments. These exclusions are made on the grounds that we are uncertain of the impact of the Uruguay Round Agreement on non-tradable service industries of the above kind. We also exclude from our sample firms which were not traded continuously in our event window to mitigate the introduction of erroneous but sizable noise. Firms not continuously traded include those firms which were first time listed, or delisted, or suspended for trading during the event window. Finally, we exclude foreign firms listed in US stock markets in our sample mainly because a

greater portion of these companies' assets are more likely to be located outside of the US, when compared with traditional US firms. We are left with 202 industries.

Daily stock market data for the purposes of constructing returns are obtained from the CRSP daily cum dividend series. Abnormal return is calculated by subtracting the CRSP value- weighted return market index series from the value weighted industry return for that day. The cumulative abnormal return is then constructed by summing the daily abnormal returns for industry i over the event window.

Data for the construction of the capital and technology intensity variables [CAPITAL and TECHNOLOGY] are obtained from the Compustat annual tapes. We sort firms into 3-digit classifications according to their declared core industry. We then aggregate firm data into industry data, which are compared to the US economy wide ratios that we calculate from all industries for which Compustat has firm level data. The Compustat tapes do not contain enough firm level data to allow us to construct reliable firm level value-added data. Because of that we define capital and technology intensity using number of employee as the denominator.[11]

We use 1993 annual firm-level data because 1993 is the closest year before and including the conclusion of the Uruguay Round. We do not believe that the inclusion of the event date in this period will create misleading results, as the event date is near the financial year end for most firms. Besides, the reallocation of real resources such as physical assets and employment due to the Uruguay Round effects would not likely be felt until after the agreement was ratified by US Congress in late 1994.

The three independent variables, CAPITAL, TECHNOLOGY, and HCAPITAL, are meant to capture comparative advantage; they are measured as deviation from the US average. Industries showing positive (negative) deviations are more (less) capital, technological, and human capital intensive

than the US average industry and are thus categorized as industries with comparative advantage (disadvantage). Similarly, a positive value in NEXPORTS indicates an industry with comparative advantage. We expect all four independent variables to be positively correlated with the stock price reaction to the conclusion of the Uruguay Round.

6a. Basic Empirical Results

[Table 3 about here]

Table 3 shows the market return and the cumulative market return from December 14 to December 20, 1993. Market returns were positive on both December 15 and 16 and negative for all other trading days. Based on market performance for the previous 245 days, returns on all trading days are insignificantly different from the average. The only possible exception is the market return on December 16, which is marginally significant at the 10% level using a 1-tailed t-test. None of the cumulative market returns are significant. Overall, the single day and the cumulative market returns suggest that while the stock market did react positively, investors did not expect the Uruguay Round Agreement to have a substantial net impact on the value of U.S. publicly traded firms. In addition, these returns suggest that there was no systematic post-event re-evaluation of stock values. We also checked the Wall Street Journal News index and found no other news worthy major events around the windows.[12]

[Table 4, Panels A & B about here]

Table 4 shows summary statistics of the variables described in Section 5. Univariate statistics are displayed in Panel A and simple correlation coefficients are displayed in Panel B. The mean cumulative abnormal return for the three day window (December 14, 15, and 16) for our 198 US industries is -0.21 percent. This value is not significantly different from zero with a t-ratio of 0.086. CAPITAL_i is in dollars of property, plant and equipment per employee and TECHNOLOGY_i is measured in dollars of R&D spending per employee. Both the average values for CAPITAL_i (industry capital to labor ratio less the US employment weighted average) and for TECHNOLOGY_i (industry R&D spending

to labor ratio less the US employment weighted average) are less than zero. Among the included industries are some that are large and highly capital and technology intensive, which results in the weighted average capital intensity exceeding the simple average. The means of both $CAPITAL_i$ and $TECHNOLOGY_i$ are not statistically significantly different from zero, with t-ratios of 0.035 and 0.595 respectively. The average of NEXPORTS is negative, not a surprising result given the overall trade deficit in 1993.

As shown in Panel B, Table 4, the abnormal return, CAR_i, is positively and significantly correlated with technology intensity ($TECHNOLOGY_i$) and net export intensity ($NEXPORTS_i$) beyond the 1% level. The strong correlation indicates that industries with above (below) average technological intensity and net export (import) industries did experience appreciation (depreciation) in firm value during the event window. However, CAR_i is insignificantly related with capital intensity ($CAPITAL_i$,) and human capital intensity ($HCAPITAL1_i$ and $HCAPITAL2_i$). Indeed, the correlation between $CAPITAL_i$ and CAR_i is even negative. The physical capital and human capital intensity variables may be measured less accurately or may simply be less successful proxies in identifying U.S. industries that have a comparative advantage and will benefit from reductions in foreign trade barriers.

The relatively stronger results on technology-intensive industries may indicate that current trade barriers are higher on products in these industries than in purely capital-intensive industries. It is also possible that the minimum standards of intellectual property protection provided via the Uruguay Round Agreement enhance the value of the industries that rely on intellectual property protection to appropriate rents. Industries investing substantial resources into R&D, i.e. industries that are technologically intensive, are the largest users of traditional forms of intellectual property protection, such as patents. As the value of patents increases from enhanced international intellectual property rights protection, the value of the patenting firm increases accordingly. Thus, it appears that investors are optimistic about the extent to which clauses on intellectual property protection will be implemented.

Notice that the four intensity variables do not show a consistent pattern of correlation. For example, net export intensity is not significantly correlated with any of the other intensity variables.

While the two human capital intensity measures are highly correlated, they similarly do not show any consistent and significant correlation with other intensity variables. The lack of consistent correlation among these proxies for comparative advantage supports our choice of using multiple proxies to capture the characteristics of industries which may benefit from the Uruguay Round Agreement.

[Table 4, Panel C about here]

Table 4, Panel C, displays OLS regression results explaining the relationship between cumulative abnormal return and variables representing comparative advantage. In columns 1 to 5, we enter each explanatory variable independently. In column 6 and 7 we enter all intensity measures as explanatory variables, using the two human capital intensity measures alternately. In all these regressions, we use White's (1980) heteroskedastic consistent standard error to calculate the t statistics whenever White's chi-square test indicates the presence of heteroskedasticity.

As can be seen in Table 4, the simple regression results duplicate those reported in Panel B. Both $NEXPORTS_i$ and $TECHNOLOGY_i$ are highly positive and significant beyond the 0.01 level (two-tailed test). The other factor intensity variables are insignificant.

The multiple regression results reported in Panel C, Table 4 suggest that in the presence of net export intensity the technology-intensity measure loses its explanatory power. Perhaps this outcome can be explained as follows. While the US comparative advantage is likely in technology intensive industries, there are other determinants for the US comparative advantage not captured by technology intensity. In the simpler regression 4.2, the only determinant is technology intensity and thus the variable is significant. In the regression where comparative advantage is explicitly captured by net trade, the technology intensity variable loses its explanatory power. One way to check this interpretation is to replace our net trade variable by a less informative variable. Recall that $NEXPORTS_i$ is defined as (exports - imports)/total shipment in industry i. A less informative measure is a dummy which is equal to one when $NEXPORTS_i$ is positive, and zero otherwise. When this less informative trade variable is used instead of the original $NEXPORTS_i$ variable, $TECHNOLOGY_i$ regained its significance and the less informative trade variable gets a prob-value of 11%.

Another reason for the difference between the results in column (4.2) and columns (4.6) or (4.7), however, is the difference between the two samples used in the estimation. For 72 industries we have the technology-intensity measure but not the export-intensity measure. When we repeat the regression in column 2 using only the sample from column (4.6) or (4.7) (i.e. excluding the 72 industries), the technology-intensity variable also loses its explanatory power.

Are there any systematic differences between the technology intensity of the full sample and of the 72 industries for which the net export variable is not available? The mean technology-intensity value for the excluded industries is less than for the full sample, although the difference is not statistically significant. The median value of the excluded industries also is smaller than the median of the full sample, and based on nonparametric test statistics this difference is statistically significant; the median R&D-intensity value of the excluded industries is -5825, which is lower than the full sample median with a prob-value of 0.0032 based on a median two-sample test and a prob-value of 0.0007 based on the Wilcoxon rank sum test.

While most of the excluded industries are not very R&D intensive, visual inspection nevertheless shows that some of those excluded are highly R&D intensive. Both groups of observations may have an important influence on the estimated outcome. One way to assess the importance of such groupings, which differs from the observation-by-observation treatment applied in residual diagnostic tests, is to drop from the full sample the top 5% and the bottom 5% of observations ordered by R&D intensity. Using that sample results in the R&D intensity coefficient from the simple regression becoming insignificant, an indication that the influence of technology apparently is not a continuous linear relationship but rather more important when values diverge substantially from the mean.

6b. Robustness and Economic Significance

Two issues remain: the robustness and the economic significance of our results. In determining the results reported in Table 4 we checked for the presence of outliers in our regressions using student residuals and Cook's D. In our original sample, we found four outliers: forest products, metal mining services, non-metallic minerals services and bus charter services[13]. All of these outliers were influential in the sense that results were skewed when the outliers were included. Capital intensity became positive

and significant but technology (R&D) intensity became insignificant; no other explanatory variables were affected. In addition, each of the four industries contains only one firm, and they are the only industries selected from the COMPUSTAT file where a single firm accounts for the entire industry. To avoid having our results affected by noise, which will be particularly dominant in single firm industries, we have dropped these four industries. All of the results reported in Table 4 and subsequently are based on the sample excluding these four industries, and the diagnostic tests applied above identify no outliers in estimates based on that sample.

In order to further check the robustness of our results, we consider alternative specifications. First, we address the possibility of bid-ask bounce, or bias, in our calculation of cumulative abnormal returns. Notice from Table 3 that the market return switched in sign from December 14 to December 15 and then switched in sign again from December 16 to December 17. It can be shown that such a pattern can introduce noise in the cumulative abnormal return where this return is calculated by simply summing each day's abnormal return over the event window.[14] An alternative calculation corrects for this problem. By first adding an industry's weighted return over the event window and then subtracting the sum of the market return over the event, we obtain a measure of the market rate adjusted abnormal return without the noise. Using this new measure of cumulative abnormal return, we re-estimated the regressions in Table 4-C and obtained almost identical results. To conserve space, we do not report these results.

Second, we address whether our observed stock price reaction is permanent or transitory. It is possible that the market first reacted positively to the announcement of the Uruguay Round Agreement and then reversed its assessment completely as it learned more about the agreement. Note that it is futile to use an event study method to gauge how the market assesses an event over a long window because other events dilute the impact of the focal event. Hence, we resort to the following compromise.

By moving the event window one day forward to December 15, 16, and 17 and also expanding the event window to December 14, 15, 16, and 17, we obtain results substantially similar to those reported in Table 4-C, with slightly lower significance. When we move to the post-event window,

December 17, 20 and 21, 1993 (December 18 and 19 were not trading days), we obtained totally insignificant results, except in the case of capital intensity, which is marginally significant at the 10% level. The results from this later window are reported in Table 5.

[Table 5 about here]

In this post event window, the market had greater opportunity to assess the content of the Uruguay Round Agreement than the previous windows. We find that all regression coefficients that were significant (i.e. technology intensity and net export intensity) now have a sign opposite to, but a magnitude substantially smaller than, those obtained in the event window and which are reported in Table 4-C. It is possible, then, that the market was somewhat disappointed upon learning more about the content of the Uruguay Round Agreement and reversed its expectations accordingly. However, the market did not reverse its previous assessment to a significant extent.

Third, we are concerned about missing variables and thus spurious results. Based on White's chi-square test, we do not find heteroskedasticity to be a problem. Because heteroskedasticity is usually a sign of a missing variable, we are less concerned about that possibility.

Fourth, we are still concerned that our results in Table 4-C are merely due to the presence of only a handful of industries with large $NEXPORTS_i$, $TECHNOLOGY_i$ and large abnormal returns. In other words, we are concerned that our results may not be very general. This concern is particularly warranted after we have seen how the exclusion of highly technology intensive industries renders $TECHNOLOGY_i$ insignificant in regressions (4.6) and (4.7). Ordinary residual diagnostics are not necessarily sensitive enough to detect such an instance.

To purge the influence of observations with large magnitudes and to confine our attention to only the independent variables' influence on the sign of the stock price reactions, we re-estimated equation (1) using a logit specification. Here, we seek only the determinants for the sign of the abnormal returns. [15] This specification was run over four event windows: (1) December 14, 15, & 16; (2) December 15, 16, & 17; (3) December 14, 15, 16, & 17, and (4) December 17, 20, &21. Results are substantially similar, in terms of the sign of each coefficient and its significance, to those reported in Tables 4 and 5.

On the basis of the above robustness check, we infer that the investment community may have slightly revised its assessment of the effect of the Uruguay Round Agreement on various US industries, upon learning more about the terms of the agreement. Despite this readjustment, it is clear that investors still expected the Uruguay Round to have a positive (negative) effect on industries with comparative advantage (disadvantage) as captured by relative technology intensity and net export intensity.

We now turn to the economic significance of our results. The question is simply the extent to which the stock market re-values industries. Our regression results allow us to answer the question – the estimated abnormal return is equal to βX (where X is the vector of regressors) and the market value created and destroyed by the Uruguay Agreement is βX times the initial market value of an industry. We base the estimates on regressions (4.2) and (4.3) reported in Table 4-C.

Following the above, we find that the Uruguay Round Agreement increased the market value of above-average technology-intensive industries by $6.874 billions where our sample includes 30 such industries with an initial aggregate value of $1,100 billions (0.62%). It decreased the market value of below-average technology-intensive industries by $5.633 billions out of 172 such industries with an initial aggregate value of $1,755 billions (0.33%). The net value created is $1.241 billion. Similarly, we find that the Uruguay Round Agreement increased the market value of net exporting industries by $0.923 billions out of 49 such industries with an initial aggregate value of $972 billions (0.09%). It reduced the market value of net importing industries by $1.765 billions out of 87 such industries with an initial aggregate value of $1,244 billions (0.14%). The net value destruction is $0.834 billions. The above numbers obviously suggest that the net economic effect of the Uruguay Round Agreement is limited.

We interpret the presence of statistical significance but the absence of economic significance in the stock price reactions as an indication that investors think the Uruguay Round Agreement presents hope for successful multilateral trade and investment liberalization but they still await concrete efforts. This sentiment is consistent with Deardorff's (1994a) assessment of the Uruguay Round Agreement.

7. Conclusion and Implications

This paper attempts to use the event study methodology to capture the effects of the Uruguay Round on US business. It is unique in the sense that it uses market assessment to identify the likely beneficiaries of the trade liberalization brought about by the Uruguay Round Agreement. We find that while the Agreement does not affect the overall market return, the Agreement does lead to capital value appreciation in industries with above-average technology intensity and in net exporting industries, and to capital value reduction in industries with below- average technology intensity and in net importing industries.

These results are consistent with the interpretation that investors believe the conclusion of the Uruguay Round of negotiations represents a significant event with offsetting effects. Investors expect industries with comparative advantage to be best able to take advantage of concessions offered by foreign countries in the Uruguay Round, while industries with comparative disadvantage will lose as a result of diminished import protection. In the case of technology-intensive U.S. industries, enhanced intellectual property protection increases their value, regardless of the location of their production.

The economic significance attached by investors to the event, however, is rather small – investors do not increase (decrease) the capital value of comparative advantage (disadvantage) industries by more than 1%, and in most cases the change is less than 0.5%. Thus, investors' assessment and economists' CGE model simulation results converge – the economic impact of the Uruguay Round Agreement is limited. In spite of the political significance of the agreement, assessments of its economic impact by both CGE modellers and actual investors appear surprisingly modest.

There are several possible explanations for the lack of economic significance: the promised changes occur too far into the future (and thus largely discounted); the actual changes will be supplanted by new trade and investment barriers not covered in the Uruguay Round Agreement; the Agreement leads only to vague promises but not enough concrete actions; and the strength of government commitments to free trade is still in doubt, etc. It appears that we need much multilateral political effort for the Uruguay Round Agreement to create more economic value.

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Table 1
Key Results of the Uruguay Round

Area	New Provision
General Measures	
General Tariffs	average tariffs on industrial goods to be reduced from 6.4% to 4%
	tariffs to be eliminated in some sectors (including agricultural, construction, and pharmaceutical sectors)
	the rules of origin used in the application of tariffs are to be harmonized over time and their present use is subject to guidelines
Subsidies	prohibition of subsidies linked to export performance or local content requirements
	clearer categorization of subsidies into actionable and non-actionable subsidies, increasing transparency
	some subsidies allowed outright - those for research or to help regionally disadvantaged areas
Safeguards	tariffs or quotas are allowed to be used where a particular product is being imported in quantities sufficient to cause serious injury to the domestic industry - rules apply to this type of use
"Standard" Based Rules of Trade	guidelines established for the use of product standards applied to imports (i.e. that not be more restrictive than necessary to fulfill a legitimate objective)
	guidelines are set out to regulate the measures that may be taken by a nation to preserve human, plant and animal health
Investment Rules	local content requirements, trade balancing requirements (i.e. imports in certain proportion to exports), and foreign exchange balancing requirements prohibited
Dispute Settlement Procedures	panel reports are automatically adopted by the WTO, failing a "reverse" consensus
	retaliatory action may be sanctioned by the WTO
	appellate review of panel reports now available
	strict time schedule for steps in the resolution process
Creation of the WTO	the WTO, an organization representing the signatories to the GATT, is created to provide for renegotiation of the GATT obligations and monitoring of compliance with the GATT
Specific Measures	
Agriculture	subsidies to be reduced by 36% in value over 6 years
	subsidies coverage to be reduced to 21% of volume of agriculture over 6 years
	tariffs to be cut be 36% by the year 2000
	quotas on agricultural products prohibited
Textiles & Clothing	requires the phase out of the Multifibre Agreement - all trade in textiles and clothing to be brought within the GATT - reductions in tariffs and increases in products covered by the GATT gradually over the 10 year phase in period
	tariff bindings made on many products within these industries (US reduction in tariffs in this industry will be approximately 12% overall)
Services	requires most favored nation treatment, national treatment, and the free flow of payments and transfers for trade in services
	commitments made by *some* members of the WTO to make investment review regimes more transparent
	commitments made by *some* members to allow easier temporary admission of management and key personnel

Intellectual Property	establishes minimum standards for protection of intellectual property and for their enforcement (this standard is higher than any previously required under international law, but lower than that existing in the US

Table 2
Chronology of Events

Date	Event
February 28, 1993	US fast track authority expires: Renewed with deadline of December 15, 1993
November 17, 1993	NAFTA passes US Congress
December 15, 1993	Uruguay Round is concluded President Clinton's fast track authority expires
April 15, 1994	US formally signs the Uruguay Round Agreement
September 12, 1994	Bill implementing the Uruguay Round is informally introduced in the US Senate
September 27, 1994	Bill is formally introduced into Congress for debate
November 29, 1994	Bill ratifying US participation in new WTO passed by US House of Representatives
December 1, 1994	Bill ratifying US participation in new WTO passed by US Senate
January 1, 1995	WTO formally comes into existence

Table 3
Market Return

Day	Market Return*	t-ratio^	Cumulative Market Return*	t-ratio^
t_{-1}: December 14, 1993	-0.001981	-0.39069	-0.001981	-0.39069
t_0: December 15, 1993	0.002368	0.46702	0.000387	0.53969
t_{+1}: December 16, 1993	0.006325	1.24741	0.006712	0.76426
t_{+2}: December 17, 1993	-0.000610	-0.12030	0.006102	0.60172
t_{+3}: December 20, 1993#	-0.002429	-0.47905	0.003673	0.32396

* Market return is the market value weighted return, cum dividends.

\# December 18, 1993 was a Saturday and December 19 was a Sunday and hence not trading days.

^ The standard deviation for the purposes of calculating the t-ratio was computed from a sample of 245 trading days prior to the event window, as suggested by Brown & Warner, 1985.

Table 4
Event window: December 14, 15, & 16, 1993

Panel A: Summary Statistics

	Mean	Median	Standard deviation	Maximum	Minimum
CAR_i	-0.0021	-0.0006	0.0244	0.0634	-0.1167
$CAPITAL_i$	-3606	-42993	103299	435759	-82552
$TECHNOLOGY_i$	-3085	-5164	5187	36936	-5825
$NEXPORTS_i$	-0.1904	-0.0100	0.5802	0.3500	-4.1100
$HCAPITAL1_i$	0	-0.0066	0.0521	0.1534	-0.1166
$HCAPITAL2_i$	0	0.0005	0.0941	0.2105	-0.2495

Panel B: Simple Correlation Coefficients

	CAR_i	$CAPITAL_i$	$TECH_i$	$NEXPORTS_i$	$HCAPITAL1_i$
$CAPITAL_i$	-0.0619 (0.3864) (198)				
$TECHNOLOGY_i$	0.2087 (0.0032) (198)	-0.0050 (0.9440) (198)			
$NEXPORTS_i$	0.3902 (0.0001) (126)	0.1608 (0.0721) (126)	0.1030 (0.2511) (126)		
$HCAPITAL1_i$	0.0886 (0.3161) (130)	-0.1559 (0.0766) (130)	0.2364 (0.0068) (130)	-0.0285 (0.7416) (136)	
$HCAPITAL2_i$	0.1054 (0.2326) (130)	-0.0027 (0.9761) (130)	-0.0382 (0.6658) (130)	0.1226 (0.1552) (136)	0.5468 (0.0001) (140)

Note: The number in the first pair of parentheses below sample coefficients are estimated probability levels for the hypothesis that the true correlation is zero. The number in the second pair are number of industries without missing observations.

Table 4
Panel C

Event window: December 14, 15, & 16, 1993

OLS results of regressing cumulative abnormal return on measures of comparative advantage

Independent Variable	(4.1)	(4.2)	(4.3)	(4.4)	(4.5)	(4.6)	(4.7)
$CAPITAL_i$	-1.3928E-8					-1.0455E-8	-1.4714E-8
	(2E-8)					(2E-8)	(2E-8)
$TECHNOLOGY_i$		90E-8***				8.0852E-8	18.8E-8
		(28E-8)				(34E-8)	(33E-8)
$NEXPORTS_I$			0.0132***			0.0135***	0.0130***
			(0.0027)			(0.0029)	(0.0130)
$HCAPITAL1_i$				0.0328		0.0357	
				(0.0246)#		(0.0325)	
$HCAPITAL2_i$					0.0219		0.0142
					(0.0187)		(0.0177)
R^2	0.0034	0.0491	0.1554	0.0075	0.0105	0.1681	0.1643
Sample Size	198	198	126	130	130	126	126

*** $p < 0.01$

White's heteroskedastic consistent standard errors used where the null hypothesis of homoskedastic variance is rejected.

Note: Standard errors appear in parentheses below parameter estimates.

Table 5

Event window: December 17, 20, & 21, 1993

OLS results of regressing cumulative abnormal return on measures of comparative advantage

Independent Variable	(5.1)	(5.2)	(5.3)	(5.4)	(5.5)	(5.6)	(5.7)
$CAPITAL_I$	3.3334E-8*					4.356E-8	4.1376E-8
	(2E-8)					(3E-8)	(3E-8)
$TECHNOLOGY_I$		-33E-8				-14.9E-8	9.6962E-8
		(34E-8)				(48E-8)	(46E-8)
$NEXPORTS_I$			-0.0002			-0.0012	-0.0014
			(0.0038)			(0.0040)	(0.0041)
$HCAPITAL1_i$				0.0084		0.0179	
				(0.0431)		(0.0452)	
$HCAPITAL2_i$					0.0048		0.0053
					(0.0209)#		(0.0246)
R^2	0.0144	0.0047	0.0000	0.0003	0.0003	0.0172	0.0163
Sample Size	198	198	126	130	130	126	126

* $0.05 < p < 0.1$

*** $p < 0.01$

\# White's heteroskedastic consistent standard errors used where the null hypothesis of homoskedastic variance is rejected.

Note: Standard errors appear in parentheses below parameter estimates.

ENDNOTES

[1] See the CGE studies surveyed in Schott (1994, pp. 202-204), which report a range of annual benefits to the United States from $14 billion to $80 billion. Another useful collection of studies based on the Uruguay Round Agreement is contained in Martin and Winters (1995).

[2] For a more complete discussion of the implications of these provisions, see Schott (1994) and Deardorff and Stern (1994).

[3] Average tariffs on industrial goods will be reduced from 6.4% to 4%. Tariffs in some sectors will be completely eliminated. Additionally, rules related to the application of tariffs have been revised and harmonized to make them more transparent.

[4] Rules on subsidies have also been extensively revised. A "subsidy" is now formally defined and a new system of subsidy classification has been developed. This system categorizes subsidies into red, yellow and green light subsidies. Red light subsidies, such as those linked to export performance or local manufacturing content, are prohibited by the GATT. Green light subsidies include assistance for research activities or disadvantaged regions and are specifically allowed. Yellow light subsidies are those that are not prohibited outright but may cause injury to the domestic industry of another member nation. How yellow light subsidies will be disciplined still is unclear.

[5] Rules on antidumping have been improved. New procedures have been developed to determine the existence of dumping and to calculate the margin of dumping. Minimum standards for dumping margins and market share must be exceeded for action to be taken. Additionally, sunset provisions require antidumping duties to be phased out within five years.

[6] The phase in period is 2 years for developed countries, 5 years for developing countries, and 7 years for the least developed countries.

[7] Previously, panel reports (the outcome of adjudication on trade related disputes) were not valid until adopted by all GATT signatories. Because the alleged infringing nation was also a signatory, unfavorable panel reports often were blocked. Under the new DSM(Dispute Settlement Mechanism), infringing parties can no longer block adoption of panel reports. Adoption is automatic failing a reverse consensus by all WTO members. Also, for the first time appeals are now available. To prevent time delays strict time limits on dispute settlement procedures have been set. Overall, the new dispute settlement mechanism will allow better access to relief from unfair trade practices and more power to sanction non-compliant WTO members. The effectiveness of the DSM will depend upon the willingness of nations to participate in the process and to accept its outcomes. In 1997 the United States boycotted the proceedings of a panel brought to consider the legality of certain US sanctions against Cuba under the Helms-Burton Act. Further, the US has not always used the DSM to settle its trade disputes with other nations. In 1995, the US acted unilaterally rather than use the DSM, and threatened to impose tariffs on Japanese luxury vehicles to encourage the Japanese government to ensure fair market access for US autos and auto parts in Japan. However, the United States has adopted

remedies in rulings against it, as in the Costa Rican underwear case and has so far not appeal the DSM ruling in favor of Japan in the Japanese photographic film market case.

[8] Note that the intercept has been suppressed as the null hypothesis is that the cumulative abnormal return surrounding the conclusion of the Uruguay Round is zero. Inclusion of an intercept does not improve the explanatory power of the regression equation and the intercept coefficient is in all cases insignificant.

[9] Our construction of abnormal returns follows that suggested by Brown & Warner (1980), who show that the market adjusted return model performs no worse than more complicated models and actually performs better in a variety of situations. In calculating the industry average return, each firm return is size weighted.

[10] Hall (1993, p.260) states that "R&D expenditures is a fairly good proxy for long-run R&D behavior owing to the low variance of the R&D series within a firm.". We note that the R&D proxy in Hall's paper is R&D scaled by assets.

[11] Net export intensity ($EXPORTS_i$) and the human capital intensity ($HCAPTIAL1_i$ and $HCAPTIAL2_i$) are all constructed using data from the US Bureau of the Census. The net trade balances (exports - imports) by 3-digit SIC product groups are extracted from Table 28 (Census Basis; Foreign and Domestic Exports, F.A.S; General Imports, Customs; Millions of Dollars) of the *National Trade Data Bank and Economic Bulletin Board - products of STAT-USA (1994), U.S. Department of Commerce*. Total U.S manufacturing product shipments by 3-digit SIC industries are taken from Table 1 in "Value of Product Shipments" of *U.S. Census Bereau's 1994 Annual Survey of Manufactures (ASM), U.S. Department of Commerce, Economics and Statistics Administration, Bureau of the Census*. The human capital intensity variables, $HCAPITAL1_i$ and $HCAPITAL2_i$ are calculated from Tables 2 and 3 of the "Statistics for Industry Groups and Industries" in the same publication.

[12.] For example, positive news which reduces the cost of capital will lead to market wide stock price increase. Moreover, such news will systematically raise the stock value of industries which rely to a great extent on future cash flows. Such industries may have above average capital and technology intensity. Our market return on Table 3 does not indicate the presence of such news in our event window.

[13.] Outliers are those which have student residual greater than 3 and Cook's D greater than one.

[14.] Consider that a firm's share value is 1 on day 1, 0.8 on day 2 and 1 again on day 3. Similarly, let the market index value be 0.8 on day 1, 0.5 on day 2 and 0.8 on day 3. The true return for both the firm and the market in the 3 days should be zero, and so should be the abnormal return. A simple day by day calculation gives the following: The raw returns for the firm between day 1 and 2 is -0.2 and between day 2 and 3 is 0.25. The market return between day 1 and 2 is -0.375 and between day 2 and 3 is 0.6. The day by day abnormal return for the firm between day 1 and 2 is 0.175 and between

day 2 and 3 is -0.35. Simply adding the day by day abnormal return gives the wrong cumulative abnormal return of -0.175.

[15.] Cumulative abnormal returns were coded as follows: $CAR_i > 0$ coded as 1; $CAR_i = 0$ coded as 0; and $CAR_i < 0$ coded as 0. An alternate coding was also used, where $CAR_i = 0$ was coded as 1. This alternative method yielded identical results.