

# **The Incidence of Export Subsidies as Revealed by Market Reactions**

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March 2002

We thank Naomi Feldman for excellent research assistance, and seminar participants at Harvard University, University of Michigan, Stanford University, University of Texas at Austin and the UNC Tax Symposium for helpful comments and discussions, and the Lois and Bruce Zenkel Research Fund at the University of Michigan and the Division of Research at the Harvard Business School for financial support.

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ABSTRACT

This paper investigates the economic impact of tax incentives for American exports by closely examining stock price reactions to a critical event in 1997. On November 18, 1997, the European Union filed a complaint before the World Trade Organization, arguing that the United States offers American exporters illegal export subsidies by permitting them to use Foreign Sales Corporations to exempt a fraction of export profits from taxation. The evidence indicates that American multinational share prices were sharply impacted by that day's news of possible removal of export tax benefits. Negative abnormal returns on that day were correlated with propensity to export, net-operating losses, and foreign tax rates. The magnitude of the share price response and the associated coefficients on various explanatory variables are consistent with the importance of these subsidies to multinational exporters. In particular, exporters without net operating losses that could not benefit from alternative export subsidies were the most adversely affected by the news of November 18, 1997. Finally, market structure as proxied by firm profitability is also a significant determinant of the magnitude of the price reaction. This evidence is consistent with the arguments of strategic trade theorists that export subsidies can improve the competitive position of imperfectly competitive firms.

JEL Classification: H87, H25, D43, F13.

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## ***1. Introduction***

International trade policies have the potential to affect the welfare of nations and the profitability of exporters. The purpose of this paper is to investigate the effect of U.S. export tax subsidies on the stock market valuation of American exporters, and in doing so, to draw more general conclusions about the impact of these subsidies and the economic environment in which they operate. Of particular interest is the working of the intricate and arcane U.S. system of subsidizing exports, and the extent to which the effect of export subsidies depends on market structure. In order to identify the impact of export tax subsidies on firm valuation it is useful to analyze price reactions to important news that is relevant to tax policies, and fortuitously, one of the latest rounds in the ongoing trade dispute between the United States and Europe provides an instructive episode.

On November 18, 1997, the European Union brought a complaint before the World Trade Organization (WTO), accusing the United States of violating the rules prohibiting members of the WTO from subsidizing exports. In its initial complaint, Europe maintained that provisions allowing American firms to route their export sales through tax-avoidance devices known as Foreign Sales Corporations (FSCs) provide firms with export-contingent tax subsidies of roughly \$4 billion a year. The European Union argued that European firms are thereby unfairly disadvantaged in competition with American firms in foreign markets, and requested that the WTO require the United States to discontinue its program or else face WTO-imposed sanctions and penalties.

As trade disputes often do, the conflict between the European Union and the United States then moved to consultations between the two parties, in this case to no avail. Ultimately,

in July 1998, the European Union lodged a more formal complaint, and over the following months the complaint was considered by a panel of WTO member countries. This WTO dispute resolution panel issued a report in May 1999 highly critical of the U.S. FSC rules, a report that was formally adopted by the WTO in February 2000. By late 2000, the United States passed legislation to eliminate FSCs and replace them with an export subsidy program with almost identical effects. Since Europe is not satisfied with the most recent U.S. reform, resolution of the controversy has been pushed into the middle of 2001.

This paper investigates price reactions to this controversy in order to estimate the extent to which the threatened removal of export subsidies is capitalized into share prices of American exporting firms. These estimates demonstrate the extent to which taxes and tax benefits are capitalized into share prices and how the peculiarities of this subsidy regime limit or amplify the share price impact of this event. Generally speaking, major American exporters evidenced the largest negative abnormal stock market returns on November 18, 1997. This effect was greatly attenuated for exporters with net operating loss carryforwards, for whom tax subsidies are less valuable than they are for others. In addition, the stock prices of firms with foreign income taxed at high rates reacted less sharply than did other stock prices, reflecting the access of such firms to alternative export subsidies that were more attractive than Foreign Sales Corporations. Finally, the prices of more profitable firms exhibited the most pronounced negative reactions to news of the European complaint, which is consistent with the theoretical implications of models of export subsidies in imperfectly competitive industries – and with strategic trade theory.

Section two of the paper describes the two primary tax subsidies available to American exporters and their interaction.<sup>1</sup> While the Foreign Sales Corporation program allowed firms to exempt a portion of export profits, separate provisions of the Internal Revenue Code permit exporters to allocate some fraction of profits on export sales to foreign source income from the standpoint of U.S. taxation, thereby shielding the allocated portion from U.S. taxes. Section three discusses the timeline of the WTO controversy. Section four provides a partial equilibrium model of the incidence of export subsidies under varying market structures. This model results in a set of predictions regarding the impact of the WTO controversy on share prices. Section five tests that model empirically by examining the determinants of abnormal returns for exporters. This section provides evidence that WTO events influenced stock price movements and that market structure is an important determinant of the incidence of these export subsidies. Section five also studies the correlations across event days to investigate the potential importance of these developments for multinational share prices. Section six of the paper is the conclusion.

The empirical strategy used to estimate reactions to the November 1997 event combines the asset pricing approach to tax incidence (Summers 1981, 1985; Cutler 1988) with the strategic trade literature's emphasis on the importance of imperfect competition (Brander, 1995). The results are also consistent with other event study efforts, such as Schipper and Thompson (1983, 1985), that isolate the impact of regulatory changes on the share prices of impacted firms. By comparing predicted abnormal returns with the effects of mitigating factors such as the presence of net operating losses and the availability of alternative subsidies, it is possible to quantify the

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<sup>1</sup> The phrase "export subsidy" appearing here and elsewhere refers only to the economic concept of export subsidy (as used, for example, by Krugman and Obstfeld (1991, pp. 108-111)), and not the legal concept of "export subsidy" as defined by WTO rules. A far more elaborate legal and textual analysis than that provided in this paper is necessary in order to determine whether or not U.S. export tax incentives represent "export subsidies" as defined by the WTO.

importance of net operating losses and the value of alternative export subsidies. The results are suggestive of the extent to which home country export policies can aid domestic firms from a strategic trade policy perspective.<sup>2</sup> Given the profitability-indexed nature of the export subsidies employed by the United States, these subsidies serve as a prime example of policies that assist high value-added industries.

Several important economic issues lie at the heart of the recent WTO dispute. The importance of trade to U.S. multinational corporations, domestic concern over outsourcing of production to foreign affiliates, the magnitude of FSC benefits received by large American exporters,<sup>3</sup> and the chronic trade deficit facing the United States, all suggest that the delivery of tax incentives to exporters will remain a central aspect of the public policy debate surrounding how corporations are taxed. Regardless of the outcome of the WTO dispute, it is worthwhile and instructive to evaluate the impact of the curious mechanisms that have evolved to subsidize American exports on firm valuation.<sup>4</sup>

## 2. *American export incentives*<sup>5</sup>

The United States provides export tax subsidies through the exemption of export profits from U.S. taxation and through the ability to allocate export profits to foreign source income. Between 1971 and 2000, a fraction of export profits could be exempted from taxable income by routing exports through a distinct entity such as an FSC. (This exemption is now automatic for export income treated as U.S. income.) The alternative of allocating certain export profits to foreign source income for the purposes of U.S. income taxation effectively shields such export

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<sup>2</sup> See Brander (1995) for a discussion of the theoretical underpinnings of strategic trade policy.

<sup>3</sup> Oyola (2000) provides estimates of the contribution of FSC benefits to the net incomes of major exporters.

<sup>4</sup> Desai and Hines (2000a) further outline alternative export subsidy regimes and their relative merits.

<sup>5</sup> This section draws on Desai and Hines (2000b).

profits from U.S. income taxation for those firms with excess foreign tax credits. While the allocation method is more generous for some taxpayers than the exemption method, it is also the more complicated of the two, and the focus of much less popular attention. Consequently, this section first reviews the U.S. tax provisions that permit the exemption of certain fractions of export income from U.S. taxation.

### ***2.1 Subsidy by exemption of income: FSCs and IC-DISCs***

Between 1971 and 2000, firms exporting goods from the United States were entitled to do so in a legally roundabout fashion that enabled them to exempt a fraction of export profits from taxation. While complying with the necessary rules was cumbersome, the tax advantages were large enough to make it well worth the while of most large American exporters to take advantage of this opportunity.

In order to benefit from this export tax subsidy, it was necessary to establish an FSC in an offshore location such as Guam, Barbados, or the Virgin Islands. For legal purposes, exports might then travel from the United States to their ultimate foreign destinations via the FSC. Hence, an American computer company that sells a computer manufactured in Texas to a buyer in northern Italy first sells the computer to its FSC located in Guam, which in turn sells the computer to the buyer in Italy. The computer does not travel to Guam in the course of this sale, nor are the FSC offices located in Guam typically very active; instead, these are largely paper transactions. In the course of these transactions, the FSC located in Guam earns a profit; some of

this profit is immediately subject to U.S. taxation, but a fascinating 15/23 was forever exempt, thereby providing a tax subsidy for exporters.<sup>6</sup>

For an American firm whose profits are fully taxed by the United States at the 35 percent corporate tax rate, there was a benefit associated with making the FSC's share of total export profits as large as possible.<sup>7</sup> Consider the case in which the American computer manufacturer produces its computer for \$1,500 in the United States and sells the computer in Italy for \$2,000. Without the use of an FSC, all \$500 of this profit is subject to U.S. taxation at the 35 percent rate. With the FSC involved in the transaction, the FSC might purchase the computer for \$1,885 and sell it in Italy for \$2,000, thereby earning an export profit of \$115. The American exporting company therefore will owe taxes on the remaining \$385 of export profits, and its FSC will likewise owe U.S. taxes on  $(8/23)*\$115$ , or \$40. The remaining \$75 [ $(15/23)*\$115 = \$75$ ] of FSC profit is exempt from U.S. taxation, and, since FSCs are located in offshore jurisdictions that impose no taxes, the \$75 is also exempt from foreign taxation. At a tax rate of 35 percent, this translates into a tax saving of \$26.25. Since law fixes the 15/23 exclusion ratio, it is therefore in the taxpayer's interest to establish that the FSC export profits are as large as possible.<sup>8</sup>

As a consequence, U.S. law also required taxpayers to calculate the profit of an FSC based on methods that limit the exempt fraction of total export profits. Taxpayers are entitled to choose among several different methods of distributing export profits between the exporter

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<sup>6</sup> Alternatively, the Guamanian FSC might not take title to the export property, but instead receive a commission for facilitating the export sale. According to data reported by Belmonte (2000), 21% of FSCs in 1996 bought and sold export property, while the remaining 79% simply received commissions for export sales.

<sup>7</sup> The tax benefits of exporting through FSCs are available to all corporations in the United States, including those that are foreign-owned.

<sup>8</sup> Taxpayers are not entitled to defer U.S. taxation of FSC profits. Corporations exporting through FSCs instead receive tax benefits in the form of the exemption of 15/23 of FSC profits.

located in the United States and its offshore FSC. The most commonly used method was simply to assign the FSC a commission equal to 23 percent of export profits. In the previous example, \$115 of FSC profit was arrived at through the application of this method. It is on the basis of the prevalence with which exporters assigned their FSCs 23 percent of export profits, together with the 15/23 exclusion ratio, that FSCs are typically described as exempting 15 percent of export profits from taxation.<sup>9</sup>

## **2.2 Subsidy by allocation of income: Export source rules**

An entirely separate type of export subsidy is available to American multinational firms with excess foreign tax credits. The nature of the subsidy is that part or all of export profits can be treated as foreign source income for the purpose of U.S. income taxation. This export subsidy is more generous to qualifying firms than is the subsidy provided by the use of FSCs and the more recent automatic exemption of 15 percent of export profits. Since many American multinational firms have excess foreign tax credits,<sup>10</sup> and the parent companies of American multinational firms account for 58 percent of all U.S. exports of goods,<sup>11</sup> it follows that this export subsidy is potentially quite important. Notably, this export subsidy is not available to American exporters that are not multinational firms.

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<sup>9</sup> See Desai and Hines (2000b) for a description and analysis of FSC income assignment alternatives that permitted some taxpayers to exempt from U.S. taxation a fraction greater than 15 percent of export income.

<sup>10</sup> Grubert et al. (1996) report that firms with excess foreign tax credits received 33 percent of the foreign income of American corporations in 1984, and 66 percent in 1990, which follows the U.S. tax rate reduction in 1986. They note that even this 66 percent figure is smaller than the 79 percent predicted right after 1986, and conjecture that contemporaneous foreign tax law changes along with the endogenous behavior of American companies may account for the difference. They also note that the fraction of foreign income received by firms with excess foreign tax credits appears to be falling over time, reaching 35 percent in 1992. In a subsequent study, Grubert (2001) reports additional evidence that changes in taxpayer behavior (such as greatly expanded receipts of foreign-source royalty income) account for much of the unexpectedly low incidence of excess foreign tax credit status after 1986.

<sup>11</sup> See the data for 1997 reported in Mataloni (1999, p. 14).

In order to understand the tax subsidy available from the foreign source rules, and the circumstances under which taxpayers might be eligible for the associated tax benefits, it is necessary to review certain aspects of U.S. taxation of the foreign income of American taxpayers. A brief description of some of the relevant features follows.<sup>12</sup>

### *2.2.1 The foreign tax credit*

Almost all countries tax income generated by economic activity that takes place within their borders. In addition, many countries—including the United States—tax the foreign incomes of their residents. In order to prevent double taxation of the foreign income of Americans, U.S. law permits taxpayers to claim foreign tax credits for income taxes (and related taxes) paid to foreign governments. These foreign tax credits are used to offset U.S. tax liabilities that would otherwise be due on foreign-source income. The U.S. corporate tax rate is currently 35 percent, so an American corporation that earns \$100 in a foreign country with a 10 percent tax rate pays taxes of \$10 to the foreign government and \$25 to the U.S. government, since its U.S. corporate tax liability of \$35 (35 percent of \$100) is reduced to \$25 by the foreign tax credit of \$10. The U.S. tax liability of such a corporation is typically deferred until it receives foreign income in the form of dividends.

### *2.2.2 Excess foreign tax credits*

Because the foreign tax credit is intended to alleviate international double taxation, and not to reduce U.S. tax liabilities on profits earned *within* the United States, the foreign tax credit is limited to U.S. tax liability on foreign-source income. For example, an American firm with \$200 of foreign income that faces an U.S. tax rate of 35 percent has a foreign tax credit limit of

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<sup>12</sup> Portions of this description are excerpted from Hines (1991, 1999a).

\$70 (35 percent of \$200). If the firm pays foreign income taxes of less than \$70, then the firm would be entitled to claim foreign tax credits for all of its foreign taxes paid. If, however, the firm pays \$90 of foreign taxes, then it would be permitted to claim no more than \$70 of foreign tax credits. Firms calculate foreign tax credits based on their total (worldwide) foreign incomes and foreign tax payments (subject to certain restrictions).

Taxpayers whose foreign tax payments exceed the foreign tax credit limit are said to have “excess foreign tax credits;” the excess foreign tax credits represent the portion of their foreign tax payments that exceed the U.S. tax liabilities generated by their foreign incomes. Taxpayers whose foreign tax payments are smaller than their foreign tax credit limits are said to be in “excess limit” or to have “deficit foreign tax credits.” American law permits taxpayers to use excess foreign tax credits in one year to reduce their U.S. tax obligations on foreign source income in either of the two previous years or in any of the following five years.

### *2.2.3 Source rules and excess credits*

Firms with excess foreign tax credits benefit whenever they can treat income earned by activities undertaken in the United States as having foreign source for purposes of U.S. income taxation, since those firms are effectively untaxed on such income. The benefit to a firm with excess foreign tax credits of allocating income to foreign source is illustrated by the comparison presented in Table 1. The American multinational firm in this example earns \$40 by exporting from the United States and an additional \$100 from the operations of its foreign affiliate. The affiliate is located in a country with a 50 percent tax rate, which, since it exceeds the U.S. tax rate of 35 percent, implies that the parent company has \$15 of excess foreign tax credits. If export profits are treated as domestic income, then the firm’s \$40 of export income is fully taxed

at the domestic tax rate of 35 percent, resulting in a tax liability of \$14. If instead the exporter can characterize 50 percent of export profits as having foreign source, then \$7 of the firm's excess foreign tax credits can be applied against the U.S. tax liability on export profits, leaving a net tax liability of \$7 on export profits. An important aspect of this benefit is that foreign governments do not coordinate their taxation of export income with the United States. Thus, the election by an American taxpayer to treat \$20 of export profits arising from sales to Italy as having foreign source for U.S. tax purposes will have no effect on any Italian taxes that the taxpayer may owe.

U.S. tax law embodies the curious principle that the location of income arising from a sale is determined, in part, by the site of the sale rather than the site of production. Section 863(b) of the Internal Revenue Code provides that half of export-related profits will be deemed to have foreign source if the taxpayer arranges to pass the export title in the foreign location rather than in the United States. Therefore, firms with excess foreign tax credits are eligible to avoid U.S. taxation of 50 percent of their export profits by taking advantage of the opportunity provided under section 863(b).

### ***2.3 Incentives for exporters and the prevalence of export subsidies***

American exporters are faced with the enviable choice between two export subsidies: the partial exemption of export income, and the allocation of half of export income to foreign source under section 863(b). For firms with deficit foreign tax credits, the export source rules do not offer the prospect of reduced U.S. tax liabilities, since income allocated to foreign source is nonetheless immediately taxable by the United States. From 1971-2000, such firms did better to route their exports through FSCs, in which case they were eligible for a 15 percent exclusion of

export profits from U.S. taxation. Legislation passed by the United States in November 2000 makes the 15 percent exclusion automatic for domestic export activity. Firms with excess foreign tax credits minimize their taxes by (from 1971 – 2000) avoiding the use of FSCs, or by (since 2000) not characterizing such income as having domestic source. Such firms can do better by using 863(b) to allocate 50 percent of export profits to foreign source, since doing so effectively excludes 50 percent of export profits from U.S. taxation.

The two columns of Figure 1 summarize the relevant differences between the exemption and allocation methods of subsidizing exports for a Texan manufacturer exporting a computer to an Italian customer during the 1971 – 2000 period when it was necessary to use Foreign Sales Corporations in order to obtain exemptions of export income. A 15% exemption of export profits was thereby available regardless of a firm's excess foreign credit status. In contrast, if the exporter was a multinational firm with excess foreign tax credits, 50 percent of export profits could escape taxation through the use of 863(b).

There is an important complication to this otherwise simple story, stemming from the fact that a firm's excess foreign tax credit status changes over time and is itself a function of many decisions that the firm makes every year. Such decisions include where to locate foreign operations, whether to finance foreign operations with debt or equity, how many dividends to repatriate from each of its foreign subsidiaries, and what costs (such as interest expenses or R&D expenses) the firm will incur in the United States and allocate in part against foreign income. As a result, the distinction between a firm with excess foreign tax credits and one with deficit foreign tax credits is perhaps more a matter of degree, reflecting different circumstances and incentives, than it is a stark characteristic of a firm carrying clear-cut implications. Since excess foreign tax credits can be carried back two years and forward five, a firm's excess foreign tax

credit status in a given year is less consequential than the pattern of its foreign tax credits over time, and the costs it incurs in taking the actions necessary to change its status.<sup>13</sup>

### 3. *The WTO Controversy*<sup>14</sup>

On November 18, 1997, the European Union lodged a complaint with the WTO alleging that the American FSC program represented an illegal export subsidy. Contemporaneous observers noted that the European complaint probably represented a retaliation for successful American claims that European import regimes for bananas and hormone-treated beef violated WTO rules. Nonetheless, observers commented on the surprising nature of the initial complaint. The original FSC complaint was followed by inconclusive consultations between the United States and the European Union on December 17, 1997, and continued unfruitful consultations on February 10, 1998. On July 23, 1999 the WTO's Dispute Resolution Panel issued its interim report stating that the American FSC program violated WTO rules. The July 23 report also indicated that the United States would be required to rescind its FSC provisions by October 1, 2000 or else face retaliatory penalties. Following the appearance of the interim report, the European Union and the United States together requested on August 6, 1999 that the panel review the precise aspects of the interim report. The WTO's final ruling against the United States appeared on September 17, 1999.

On October 28, 1999, the United States indicated its intention to appeal the WTO's report, and filed a formal notice of appeal. The U.S. appeal was withdrawn on November 2, 1999, but refiled on November 26, 1999. Following rounds of submissions by all parties to the

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<sup>13</sup> See, for example, Scholes and Wolfson (1992) for an analysis of the costs and benefits of undertaking actions that affect foreign tax credit status.

<sup>14</sup> Figure 2 summarizes the most relevant dates associated with the WTO controversy.

dispute, as well as oral hearings, the WTO formally ruled on the legality of FSCs on February 24, 2000, finding that the FSC program violates WTO rules and must be replaced by October 1, 2000.

The American response came quickly. On February 28, 2000 American Treasury Secretary Lawrence Summers said that the United States would not abandon its program of subsidizing exports, and would instead start consultations with the European Union to determine appropriate compensation. On April 7, 2000, the United States informed the Dispute Resolution body of its intention to implement its recommendations consistently with WTO obligations. Subsequent events including the passage of U.S. legislation is excluded from examination.

Contemporaneous press accounts indicate that both the November 18, 1997 and July 23, 1999 dates were considered momentous for the history of the trade dispute; other dates are significant to differing degrees. In addition, November 18, 1997 differs from most other event dates in being a very slow news day, the main international trade-related nuggets being the (anticipated) failure of a large Japanese bank and the lifting of the European ban on imports of Iranian pistachios. Hence, the filing of a European complaint against the United States was a major development, and it is reasonable to infer that share price responses would represent reactions to the news of the trade dispute.

#### ***4. The Incidence of Export Subsidies Under Imperfect Competition***

In order to assess the determinants of share price reactions to the WTO complaint, it is necessary to develop a model of firm behavior for exporters under varying market structures. This section employs a partial equilibrium model that captures many of the relevant features of the FSC regime in order to isolate the most important determinants of estimated price reactions

including the effect of market structure and the prevalence of U.S. exporters in particular goods markets. The model below is related to the strategic trade models reviewed in Brander (1995) and, most closely, to the work of Eaton and Grossman (1986). While capturing a number of the relevant features of the impact of the WTO event on multinational share prices, the impact of the WTO event on exchange rates is separately considered in Desai and Hines (2001).

Consider the case of an American firm acting as a Cournot competitor in an international industry with a fixed number ( $N$ ) of equally-sized firms producing homogenous products. The U.S. government subsidizes export profits at rate  $s$ , so firm  $i$ 's profit ( $\pi_i$ ) is given by:

$$(1) \quad \pi_i = [P - wL](1 + s)x_i - \rho Kx_i$$

in which  $P$  is the market price of the firm's output,  $x_i$  the quantity it produces,  $w$  the wage rate, and  $L$  the (constant) input requirement of labor per unit of output. Production is assumed to require a fixed quantity  $K$  of capital per unit of output; for simplicity, capital is assumed not to depreciate, and to be financed entirely with equity, the opportunity cost of which is denoted  $\rho$ . In this partial-equilibrium setting, it is appropriate to take  $P$  to be a function of industry output, denoted  $X$ .

The firm's first-order condition for profit maximization is

$$(2) \quad P + x_i \frac{dP}{dX} (1 + \theta) = wL + \frac{\rho K}{(1 + s)},$$

in which  $\theta$  is firm  $i$ 's conjectural variation, corresponding to  $\left( \frac{dX}{dx_i} - 1 \right)$ . Differing market structures correspond to differing values of  $\theta$ . In a Cournot-Nash setting, in which firm  $i$

believes that its quantity decisions do not affect the quantities produced by its competitors, then  $\theta = 0$ . In a perfectly competitive setting,  $\theta = -1$ . Various Stackelberg possibilities correspond to values of  $\theta$  that differ from these, and indeed, need not lie in the  $[-1, 0]$  interval.

It is useful to consider the pricing implications of (2). In doing so, it is necessary to take into account that foreign firms in the industry are ineligible for the American export subsidy (unless they produce in the United States for export). Let  $n$  denote the number of American exporters in the industry, and  $(N - n)$  the number of their foreign competitors. Furthermore, in order to simplify the calculations that follow, we consider the case in which the consumer demand function is locally linear, so that  $\frac{\partial^2 P}{\partial X^2} = 0$ .<sup>15</sup> For an American firm, differentiating (2)

with respect to  $s$  produces the following comparative static:

$$(3) \quad \frac{dP}{dX} \left[ \frac{dX}{ds} + \frac{dx_i}{ds} (1 + \theta) \right] = - \frac{\rho K}{(1 + s)^2}.$$

By contrast, the behavior of foreign firms – who are ineligible for export subsidies, but otherwise (by assumption) identical to their American competitors – is determined by (indexing foreign firms with  $j$ ):

$$(4) \quad \frac{dP}{dX} \left[ \frac{dX}{ds} + \frac{dx_j}{ds} (1 + \theta) \right] = 0.$$

In order to assess the incidence of the subsidy, it is useful to consider the responsiveness of the market price to changes in the subsidy as given by the identity  $\frac{dP}{ds} \equiv \frac{dP}{dX} \frac{dX}{ds}$ . Since the

market contains  $(N-n)$  foreign firms and  $n$  domestic firms, the relationship between market output and the subsidy is given by,

$$(5) \quad \frac{dX}{ds} = (N-n) \frac{dx_j}{ds} + n \frac{dx_i}{ds}$$

Equation (4) implies that, for foreign firm  $j$ ,

$$(6) \quad \frac{dX}{ds} = -\frac{dx_j}{ds} (1+\theta).$$

As  $\frac{dx_j}{ds}$  is given by (6), and  $\frac{dx_i}{ds}$  is given by (3), (5) becomes

$$(7) \quad \frac{dX}{ds} \frac{(1+\theta + N-n)}{n(1+\theta)} = \frac{dx_i}{ds}.$$

Combining (2), (3) and (7) in the identity  $\frac{dP}{ds} \equiv \frac{dP}{dX} \frac{dX}{ds}$  produces:

$$(8) \quad \frac{dP}{ds} = -\frac{n}{1+\theta + N} \left[ \frac{\rho K}{(1+s)^2} \right].$$

Equation (8) offers a first observation about the incidence of removing export subsidies.

If American firms represent the whole market, so that  $n = N$ , and American firms are perfect

competitors, so that  $\theta = -1$ , then  $\frac{dP}{ds} = -\frac{\rho K}{(1+s)^2}$ . This condition corresponds to profits being

unaffected by tax subsidies, since per-unit profits equal  $[P - wL](1+s) - \rho K$ , and the derivative

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<sup>15</sup> See Auerbach and Hines (2001) for an analysis of more general cases in which demand curves are not locally linear.

of profits with respect to  $s$  is:  $\frac{dP}{ds}(1+s) + [P - wL]$ ; imposing (8) implies that this derivative equals  $\frac{\pi_i}{(1+s)}$ . Since in a competitive market  $\pi_i = 0$ , it follows that profits are unaffected by changes in export subsidies – or, more concretely, that any loss of export subsidies would be perfectly offset (from the standpoint of American exporters) by higher final product prices.

More generally, it is possible to isolate the effect of changes in subsidies on firm profits by differentiating (1) with respect to  $s$ :

$$(9) \quad \frac{d\pi_i}{ds} = x_i(P - wL) + x_i \frac{dP}{ds}(1+s) + \frac{dx_i}{ds} [(P - wL)(1+s) - \rho K].$$

Equation (3) implies that:

$$(10) \quad \frac{dx_i}{ds} = - \frac{\frac{dP}{ds} + \frac{\rho K}{(1+s)^2}}{\frac{dP}{dX}(1+\theta)}.$$

Together, (2), (8), (9) and (10) imply:

$$\frac{d\pi_i}{ds} = x_i [P - wL] + x_i \frac{\rho K}{(1+s)} \left[ 1 - \frac{2n}{1+\theta+N} \right],$$

which in turn can be interpreted as:

$$(11) \quad \frac{d\pi_i}{ds} = \frac{\pi_i}{(1+s)} + 2x_i \frac{\rho K}{(1+s)} \left[ \frac{1+\theta+N-n}{1+\theta+N} \right].$$

Equation (11) indicates the factors that determine the effect of export subsidies on the welfare of American exporters. To further understand the impact of market structure and the prevalence of American firms on the sensitivity of American profits to changes in subsidies, it is useful to differentiate (11) with respect to  $\theta$  and  $n$  (holding  $x_i$  and  $P$  constant),

$$(12) \quad \frac{d^2\pi_i}{dsd\theta} = 2x_i \frac{\rho K}{(1+s)} \frac{n}{(1+\theta+N)^2} > 0, \text{ and}$$

$$(13) \quad \frac{d^2\pi_i}{dsdn} = -2x_i \frac{\rho K}{(1+s)} \frac{1}{(1+\theta+N)} < 0.$$

Equations (12) and (13) indicate that the impact of export subsidies on firm profitability is an increasing function of the extent to which competition in firm  $i$ 's product market is imperfectly competitive and a decreasing function of the prevalence of American firms in  $i$ 's product market.

The impact of subsidies on firm profits implied by (11), (12) and (13) is usefully considered in the four limiting cases where market structure and the prevalence of American firms are varied to the extreme outcomes. First, in the case where markets are perfectly competitive ( $\theta = -1$ ) and American firms are greatly outnumbered by foreign competitors

( $n \rightarrow 0$ ), (11) becomes  $\frac{d\pi_i}{ds} = \frac{\pi_i + 2x_i\rho K}{(1+s)}$ . Similarly, in the case where  $\theta = 0$  and American

firms are greatly outnumbered by foreign competitors,  $\frac{d\pi_i}{ds} = \frac{\pi_i + 2x_i\rho K}{(1+s)}$ . Further inspection of

(8) and (10) reveals why in both of these cases profits respond to higher subsidies by an amount equal to the sum of pretax profits plus two times the ratio of capital costs to one plus the subsidy rate. In both cases, output prices do not respond at all, allowing American firms to realize the

full benefit of the product of the subsidy and taxable export profits (equal to  $\frac{\pi_i + x_i \rho K}{(1+s)}$ ). At the same time, American firms increase their output and acquire market share from their foreign competitors, the value of which equals  $\frac{x_i \rho K}{(1+s)}$ . Together, these two considerations account for the total change in exporter profits.

In the two alternative limiting cases in which American firms approach complete dominance of the market ( $n \rightarrow N$ ), market structure matters crucially. Under perfect competition ( $\theta = -1$ ),  $\frac{d\pi_i}{ds} = \frac{\pi_i}{(1+s)} = 0$ , as any benefit of the subsidy is passed on to consumers (and  $\pi_i = 0$  if the market is perfectly competitive and dominated by Americans). In contrast, with  $\theta = 0$ ,  $\frac{d\pi_i}{ds} = \frac{\pi_i}{(1+s)} + 2x_i \frac{\rho K}{(1+s)(1+N)}$ , which, in the case of monopoly ( $N=1$ ) collapses to  $\frac{d\pi_i}{ds} = \frac{\pi_i + x_i \rho K}{(1+s)} = x_i [P - wL]$ . In the case of a monopolist, the envelope theorem applies: the value of a change in the subsidy rate equals the additional subsidy that would be received assuming no behavioral response. More generally, as American firms comprise more of the market, market structure begins to dictate the incidence of the subsidy.

In order to express this relationship in a way that is conveniently estimated, it is useful to normalize the product price  $P = 1$  (this normalization simply reflects how units of  $x$  are measured), and to introduce the variable  $\phi_i$  that denotes firm  $i$ 's (measured) rate of profit per unit of capital:

$$(14) \quad \phi \equiv \frac{[P-wL](1+s)}{K}.$$

Denoting measured profitability ( $x_i/[P-wL](1+s)$ ) by  $m_i$ , it then follows from (11) that:

$$(15) \quad \frac{d\pi_i}{ds} = \frac{m_i}{(1+s)} \left[ 1 + \frac{\rho}{\phi_i} \frac{(1+\theta + N - 2n)}{(1+\theta + N)} \right].$$

If firms differ in their profit rates but each firm has the same pre-subsidy (measured) profitability for its domestic and export sales, then the total value of the firm, given by  $\Pi_i$ , equals  $\frac{X_i}{x_i} \frac{m_i}{(1+s)}$ ,

in which  $X_i$  is total sales. Equation (15) then implies:

$$(16) \quad \frac{d\pi_i/ds}{\Pi_i} = \frac{x_i}{X_i} \left[ 1 + \frac{\rho}{\phi_i} \frac{(1+\theta + N - 2n)}{(1+\theta + N)} \right].$$

Assuming that annual dividends and changes in profits associated with changes in the subsidy are capitalized at the same rate, the left side of (16) is the percentage change in firm valuation following a change in  $s$ . The right side of (16) is the product of the ratio of exports to total sales and an expression that is a function of the firm's profit rate, the extent to which competition in firm  $i$ 's product market is imperfectly competitive, and the prevalence of American firms in  $i$ 's product market. As long as American firms represent less than half the market, then the right side of (16) is an increasing function of  $\theta$ . Since the profit rate,  $\phi$ , is presumably correlated with  $\theta$ , it follows that the impact of imperfect competition on the impact of subsidies could potentially take either a positive or negative sign.

In order to estimate the relationship implied by (16) it is necessary to have a measure of the extent of competition in firm  $i$ 's export industry. In the absence of more direct measures, one

usable proxy is firm  $i$ 's profit rate. Given that (11) and (16) predict that market structure will matter only in situations where American firms comprise a nontrivial fraction of the firms in a given product market, the following section first investigates the share price impact of the WTO controversy only as a function of the exposure of American firms to exports and the usefulness of those subsidies to those firms. Subsequent analysis considers the impact of market structure as proxied by average firm profitability.

## **5. *Data and Results***

This section examines the incidence of these export subsidies by examining the determinants of abnormal returns on dates associated with the WTO controversy, particularly November 18, 1997.

### **5.1 *Data description***

In order to study the impact of the threatened removal of the export subsidies on firm market values, the paper combines balance sheet and income statement data from Compustat with return data from CRSP. Firms were screened on the basis of continuous provision of export data from 1992 to 1998 which provided an overall sample of 691 firms. Such firms need not have had exports but must have reported export data for each of those years. The Compustat data for such firms is then matched with the return data for those firms from CRSP which yields an ultimate sample of 648 firms.

In order to isolate abnormal returns, expected returns were generated through the implementation of a two-factor model for the firms in the sample for 400 trading days prior to the onset of the first event. The coefficients from the two factors, the S&P 500 and the \$/£

exchange rate, from the first stage regression were then employed to create expected returns for November 18, 1997 and other event dates. Abnormal returns were then calculated and used as the dependent variable in the second stage regressions.

In the second stage regressions, a variety of firm-specific variables were constructed in order to study the impact of the WTO events on one-day abnormal returns. Table 2 provides summary statistics for the entire sample and Table 3 provides similar summary statistics by exporting quartile. In order to capture exporting propensity, a firm's 1997 exports are divided by 1997 sales. This exporting ratio averages 16.3% for the sample and ranges from 0.6% for the lowest quartile of exporters to 41.1% for the highest quartile of exporters. In a similar vein, ratios are constructed to capture the presence of net operating losses and the relative share of foreign assets in the asset base of a firm. For the sample, the ratio of net operating losses to sales in 1997 has an average of 16.3% with a median of 0.0%. The ratio of foreign assets to total assets has an average of 10.0% for the sample overall but similarly has a median of 0.0%.

In order to capture the foreign tax rate faced by a multinational firm, the foreign income taxes paid is divided by foreign pretax income to arrive at a foreign tax rate. For the sample, this foreign tax rate for 1997 averages 34.0% with a median of 33.2%. While other studies have employed confidential IRS data to study the sensitivity of dividend repatriation to foreign tax status, the data provided in Compustat offers the advantage of capturing their overall exposure to foreign operations and the weighted average foreign tax rate. Such a measure may well be preferred to the IRS measure which captures the timing efforts involved in a firm's decision to repatriate dividends. The foreign tax rate is only available for 202 firms. As a consequence, the regressions employing foreign tax rates as an explanatory variable are for a considerably reduced

sample size. Finally, the average pretax profit margin for 1992 through 1998 serves as a proxy for market structure.

These various variables were also interacted with the export ratio in order to better isolate the relative effect of these variables on a firm's abnormal return. In particular, the net operating loss ratio, the foreign asset ratio, and the foreign tax rate are all interacted with the exporting ratio to allow for the distinct effects hypothesized to be associated with each of these ratios. In particular, the presence of net operating losses is expected to limit the adverse price reaction associated with the potential loss of FSCs given that this export subsidy works through the income tax. The presence of large amounts of foreign assets is also expected to limit the adverse price reaction given that greater foreign assets suggests the possibility of shifting production in response to the threatened removal of the subsidy. The foreign tax rate is also interacted with the export ratio as the presence of the source allocation rules is hypothesized to limit the adverse price reaction for those firms for who can avail themselves of the greater benefits of the source allocation rules. Such firms are those firms with excess foreign tax credits or those firms with high average foreign tax rates.

Prior to the calculation of excess returns, gross returns were calculated for subsamples partitioned by exporting propensity and profitability. Figure 3 compares the average gross return for firms with and without current net operating loss with each sample split between major and minor exporters. This comparison illustrates that the relatively larger negative returns for major exporters is more pronounced for those firms without net operating losses. The more adverse reaction for exporting firms and for those exporting firms without net operating losses is consistent with the importance of the WTO actions on multinational share prices. Figure 4 provides a representation of cumulative abnormal returns for the sixty days surrounding

November 18, 1997. In Figure 4, day 21 corresponds to November 18, 1997 and firms are stratified into deciles of exporting propensity. Figure 4 demonstrates that much greater dispersion of returns begins at a time coincident with the WTO event and that firms more reliant on exports suffer larger negative returns than other firms following the announcement of EU action.

## **5.2 *Determinants of abnormal returns***

The regressions presented in Table 4 employ the one-day abnormal returns for November 18, 1997 as the dependent variable in each of the specifications. In column 1, the baseline regression examining the effect of exports on the abnormal returns of firms is presented. The coefficient on the export ratio is -0.0198 but significant only at the 10% level. In the specification provided in column 3, the net operating loss ratio and its interaction with the export ratio are included in the regression. The net operating loss interaction term carries a coefficient of 0.0045 and is highly significant. Column 5 provides a specification which also considers the relative size of foreign assets and that foreign asset ratio interacted with the export ratio. The interaction of the foreign asset ratio with the export ratio does not yield a statistically significant coefficient. Column 6 includes a measure of size given the findings in Desai and Hines (2000b) that small firms were disproportionately impacted by the transition from the DISC to FSC regimes in 1984. In the specification provided in column 6, the foreign asset ratio interaction term remains insignificant and size appears to have no effect. However, the export ratio and the net operating loss ratio interacted with the export ratio are both significant and carry the predicted sign. Finally, in column 7 an additional term that interacts the net operating loss ratio, the foreign asset ratio and the export ratio is included and is highly significant and of the predicted sign.

The statistically significant coefficients of -0.0283 on the export ratio and 0.0049 on the net operating loss interaction with the export ratio in column 6 of Table 4 can be mapped to an economic intuition. The coefficient on the export ratio suggests that a firm with one hundred percent exports would suffer a 2.83% negative abnormal return relative to a firm with no exports. As described previously, FSCs can be assumed to provide sheltering of fifteen percent of export profits. Assuming a 35% tax rate, FSCs provide a tax saving of 5.25% of exports. This tax saving should be compared to after-tax profits in considering the potential price impact of the threatened removal of FSCs. As such, the certain, unexpected removal of FSCs would result in a price drop of 8.08% ( $5.25\% / (1 - 35.00\%)$ ) for a firm characterized by all exports relative to a firm without exports.

As such, the 2.83% negative abnormal return for an all-export firm relative to a firm with no exports can be understood relative to this 8.08% price drop that would be associated with the certain, unexpected removal of the FSC subsidy. The discrepancy between 2.83% and 8.08% can be associated with several factors. First, the uncertain nature of the developments associated with the events of November 18, 1997 suggests that only an increased likelihood of the loss of those export subsidies should be impacted into the price. As such, this coefficient can be understood as increasing the likelihood of the loss of those subsidies by 35%. Similarly, there may be other alternatives, such as transfer pricing, available to a firm which suggests that the price impact associated with the loss of FSCs would be bounded by 8.08% but could easily be lower. In either case, the coefficient of 2.83% maps to a realistic reaction by market participants to the threatened loss of export subsidies.

In a similar vein, the coefficient of 0.0049 on the interaction of the net operating loss ratio with the export ratio can be understood by comparing it to the export ratio coefficient.

Given that the export ratio coefficient is 5.8 times as large, this result suggests that a firm with 5.8 times of its annual sales in the form of net operating losses would be fully insulated from any adverse price impact associated with the loss of the export subsidies.

The regressions in Table 5 consider the impact of average foreign tax rates on one day abnormal returns. The significantly reduced sample of two hundred firms limits the explanatory power of the variable of interest in Table 4. Nonetheless, the interaction of the 1997 foreign tax rate with the export ratio is highly significant across all specifications and carries a coefficient of 0.1004 in the regression of column 5. This coefficient can be understood within the same framework provided for the results in Table 4. A higher average foreign tax rate would limit the price impact of the WTO controversy as the source allocation rules would be more likely available to such firms. The coefficients presented in Table 5 suggest that a 30% increase in an average foreign tax rate – for example, from 20% to 50% - would negate any adverse price impact associated with the threatened removal of the export subsidy. Much like the net operating loss results, the foreign tax rate variables can be mapped to meaningful interpretations relative to the primary export ratio results. In this case, these results can be understood within the context of the alternative export subsidies available to a U.S multinational exporter.

The results presented in Tables 4 and 5 suggest important consequences for firm valuations as a result of the WTO controversy. In order to ensure that alternative explanations are not driving these results, it is useful to consider the other event dates associated with the WTO controversy. Unfortunately, these event dates do not provide the same level of identification given that subsequent events were more anticipated by the market relative to the initial complaint. The specifications in Appendix Table 1 use the other event days of the WTO controversy to see if the tax variables of Table 5 have similarly signed and significant

coefficients on the foreign tax variables. The results in Appendix Table 1 are mixed as three of the additional seven event days considered in Appendix Table 1 produce coefficients on the foreign tax variable at a significant level. In particular, regressions examining abnormal returns from December 17, 1997, July 23, 1999, and November 2, 1999 all produce significant results with the correct sign on the foreign tax rate interacted with the export ratio.

In a related vein, Appendix Tables 2 and 3 examine the correlation of one-day abnormal returns across event dates. If the WTO controversy were a significant determinant of abnormal returns, event dates should be characterized by higher correlations of abnormal returns. In order to test this hypothesis, Appendix Table 2 provides correlation coefficients for abnormal returns across event dates for firms without and with net operating losses as firms with net operating losses are hypothesized to have lower correlations across event dates. The first number in each cell represents the correlation of abnormal returns for firms without net operating losses and the second number represents the correlation of abnormal returns for firms with net operating losses.

The evidence is strongest for the correlations of abnormal returns of November 18, 1997 with other event dates. In particular, the correlations for those firms without net operating losses is significant for three of the corresponding event dates. For the two primary event dates, November 18, 1997 and July 23, 1999 the correlation of abnormal returns is significant and positive for firms without net operating losses and negative for the abnormal returns of firms with net operating losses. Further exploration of the correlation structure of abnormal returns between November 18, 1997 and July 23, 1999 in Appendix Table 3 by exporting propensity yields suggestive evidence of what drives that underlying correlation. The four panels of Appendix Table 3 divide the sample by exporting propensity and demonstrate that for three of the four quartiles, firms without net operating losses have higher correlations of abnormal returns

on the most relevant event dates. The evidence from alternative event dates is not nearly as robust as the evidence provided in Tables 4 and 5 but does provide suggestive evidence further indicating the importance of the WTO controversy for firm valuations.

### **5.3 *Firm Profitability and Abnormal Returns***

As outlined in section 4, market structure will be an important determinant of the predicted impact of the WTO event on shares prices to the extent that American firms comprise a nontrivial fraction of the firms competing in a given industry. The specifications in Table 6 introduce average firm profitability from 1992 to 1998 as a proxy for imperfect competition. While not an ideal proxy for the extent of imperfect competition in a product market, the historic average profitability of a firm is presumably correlated with the ability of a firm to earn economic profits in worldwide product markets.

Column (1) of Table 6 repeats the result from Table 5 demonstrating the importance of the interaction of average foreign tax rates and export ratios. In each of the other specifications, this interaction of the average foreign tax rate and the export ratios retains its significance and is relatively stable. Additionally, the interaction of average firm profitability and the export ratio is highly significant in each specification. In the final specification, which considers the effect of net operating losses, the presence of foreign assets and size of the firm, the coefficient on the interaction of average firm profitability and the export ratio is  $-0.1878$ .

The magnitude of this coefficient can be mapped to an economic intuition that relates to the initial finding of a 2.83% drop in market valuation for an export-only firm relative to a firm with no exports. The coefficient on the interaction term of  $-0.1878$  suggests that a 2.5% increase in pretax profit margins (from 5% to 7.5%) would double the price impact experienced for the

average firm in the sample which has an average ratio of export to sales of 16.3%. While it is not possible to map this hypothetical increase in average pretax profit to a change in market structure, it is reassuring that such a significant increase in pretax profit margins maps to a reasonably large effect on the price impact for the average firm in the sample. The significance of the average profitability interactions with the export ratios provides evidence of imperfect competition as an important feature of the markets in which American firms participate in as exporters.

## **6. Conclusion**

This paper offers evidence of the importance of export subsidies to certain American exporters. A close examination of stock price movements on November 18, 1997 indicates that the threatened removal of export subsidies was a significant determinant of abnormal returns. Correlations between export ratios and abnormal returns are consistent with estimates of the importance of Foreign Sales Corporations to exporters and to the changed likelihood of the persistence of those export subsidies. Correlations with the amount of net operating losses and average foreign tax rates similarly confirm that the benefits of Foreign Sales Corporations were greatest for firms with taxable income and for those firms without access to even more generous alternatives.

Perhaps most intriguing are the correlations between firm profitability and stock price reactions to news of the European complaint in November 1997. In competitive industries dominated by American exporters, the removal of U.S. export subsidies should raise final goods prices and thereby perfectly offset any effect on the profitability of exporters. If, instead, export industries are imperfectly competitive, then returns to exporters should suffer when export

subsidies are removed. Firm profitability is one indicator of imperfect competition, so the fact that more profitable firms exhibit sharper price reactions to the adverse news is evidence that the stock market anticipates a pattern of incidence that reflects the degree of industrial market competition. As imperfect competition is the basis for the theory of strategic trade policy, this evidence is consistent with its implications for export subsidies.

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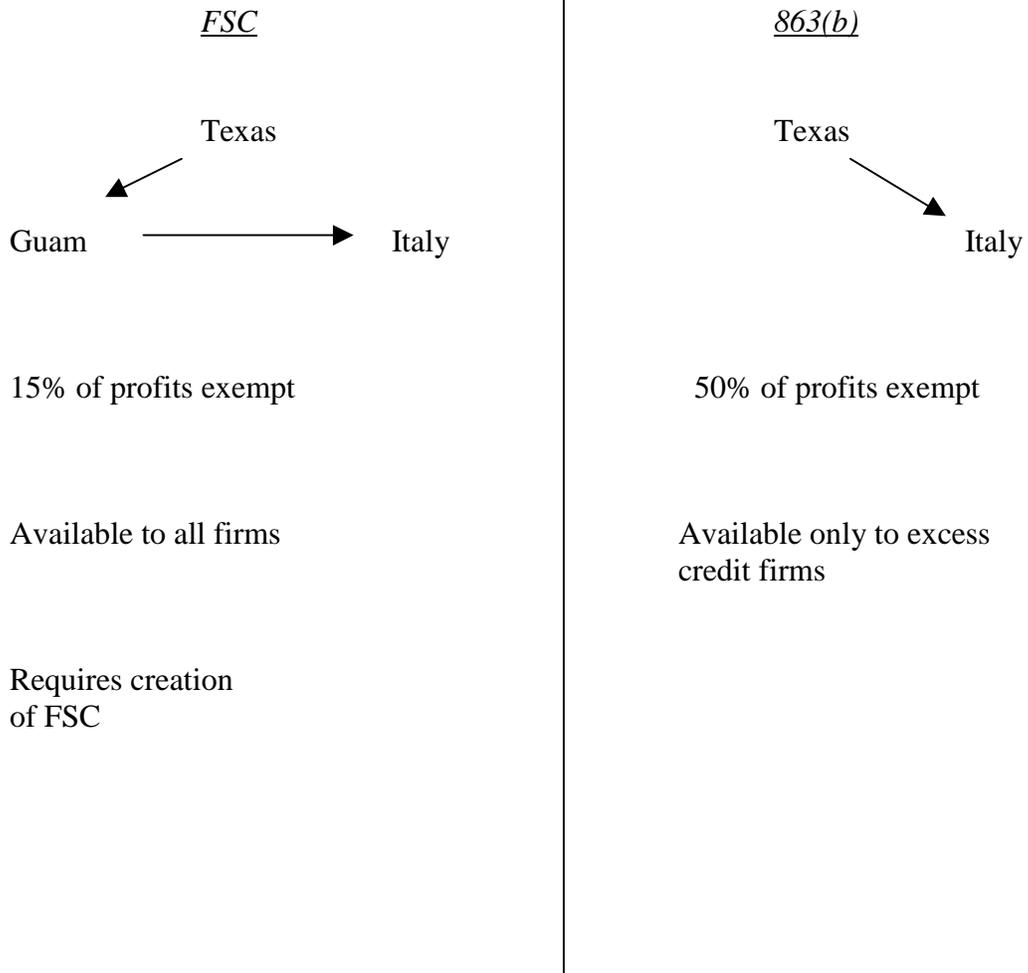
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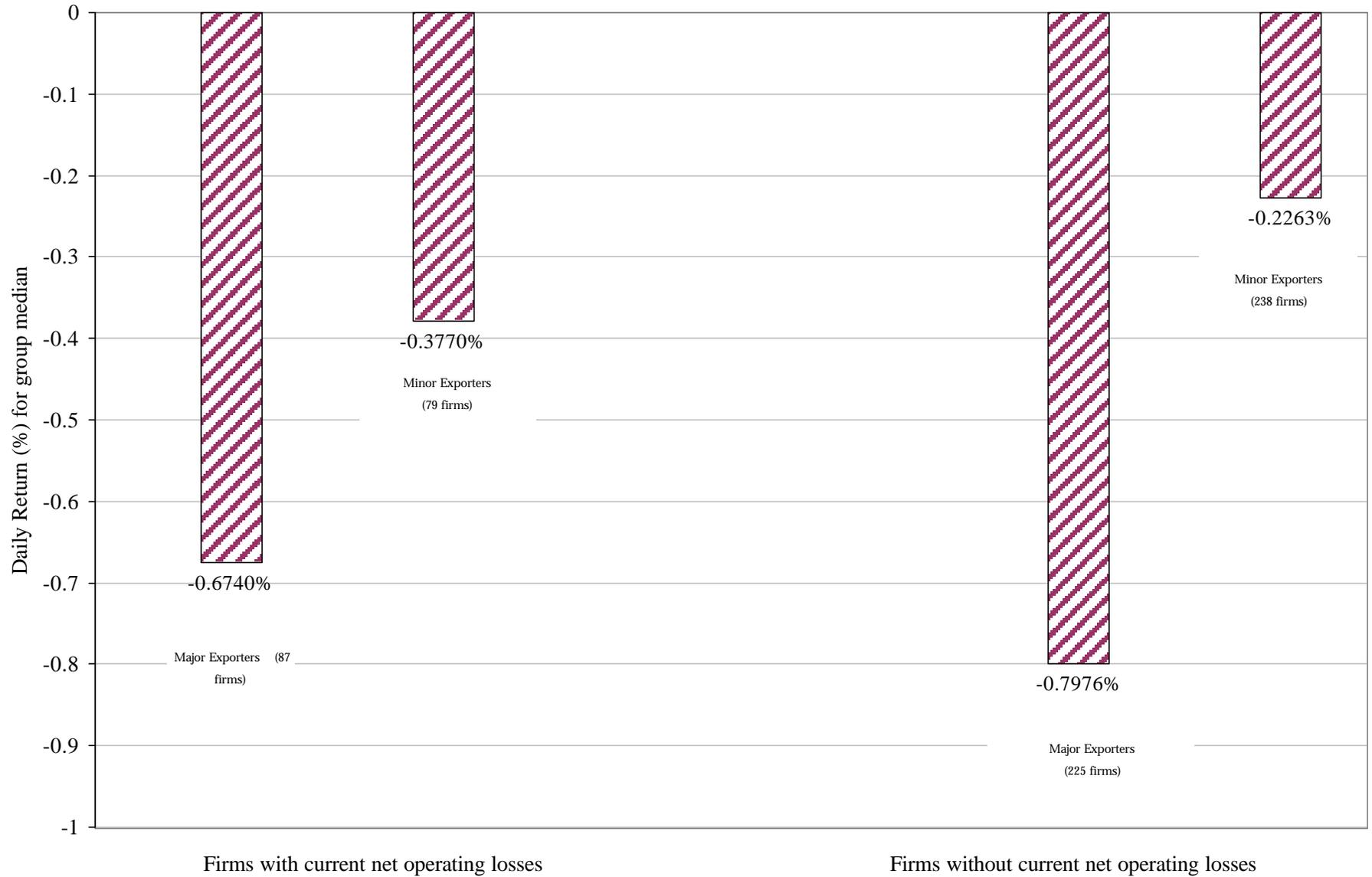
**Figure 1: Overview of Incentives for Exporters**



**Figure 2: Timeline of WTO Controversy**

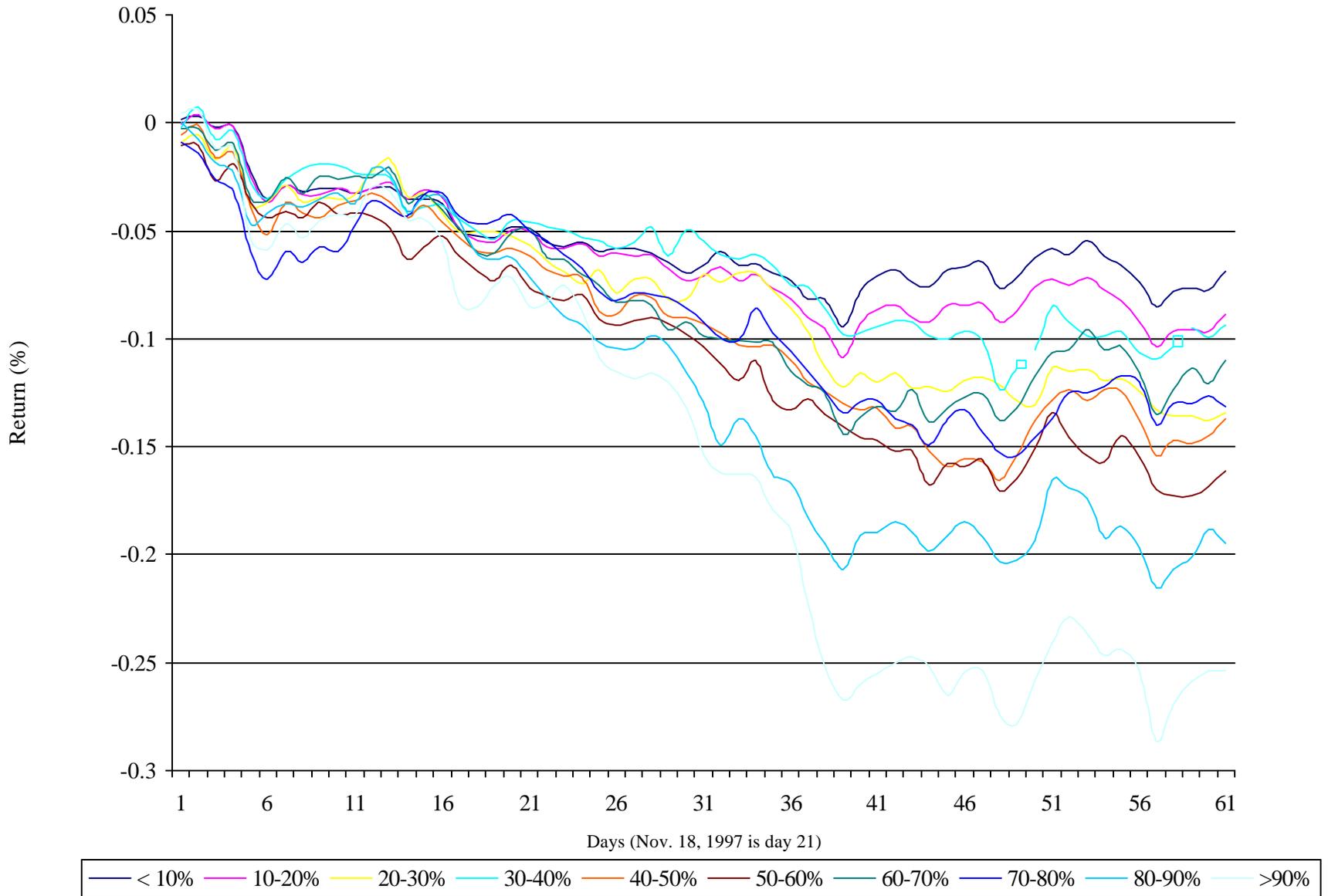
| <u>Date</u>              | <u>Event</u>                 | <u>Predicted Effect<br/>on MNC share price</u> |
|--------------------------|------------------------------|--|
| <b>November 18, 1997</b> | <b>Charges filed</b>         | -  |
| December 17, 1997        | Inconclusive consultations   | -  |
| February 10, 1998        | Inconclusive consultations   | -  |
| <b>July 23, 1999</b>     | <b>Interim Report Issued</b> | -  |
| August 6, 1999           | Joint Review Request         | +  |
| September 17, 1999       | WTO Ruling                   | -  |
| October 28, 1999         | American Appeal              | +  |
| November 2, 1999         | Appeal Withdrawal            | -  |
| February 24, 2000        | Final Ruling                 | -  |
| February 28, 2000        | Summers Rebuttal             | +  |
| April 7, 2000            | Formal American Response     | +  |

**Figure 3: Stock Price Returns for Major and Minor Exporters, by Tax Loss Status, November 18, 1997**



Note: The figure depicts stock returns of American firms on November 18, 1997, the day on which the European Union filed its complaint over the U.S. FSC program. The first two bars are for firms with net operating losses in 1997; the second two bars are for firms without net operating losses. Major exporters have export to total sales ratios exceeding 11 percent; minor exporters have export to total sales ratios of less than 11 percent. The bars depict the median daily returns of firms in each group.

**Figure 4: Cumulative Abnormal Returns for the Sixty Day Window Surrounding November 18, 1997, firms ranked by Export Ratio**



**Table 1**  
**The Benefits of Foreign Source Allocation to Firms with Excess Foreign Tax Credits**

|  | Pretax Export Income | Pretax Income From Foreign Subsidiaries | Domestic Source Income | Foreign Source Income | Domestic Tax Rate | Foreign Tax Rate | After-Tax Net Income   | Excess Foreign Tax Credits |
|--|----------------------|---|------------------------|-----------------------|-------------------|------------------|--|----------------------------|
| Without Foreign Source Allocation                      | \$40                 | \$100                                   | \$40                   | \$100                 | 35%               | 50%              | \$76=<br>\$50 (\$100 x 50%) +<br>\$26 (\$40 x 65%)                       | \$15                       |
| With Foreign Source Allocation of 50% of Export Income | \$40                 | \$100                                   | \$20                   | \$120                 | 35%               | 50%              | \$83=<br>\$50 (\$100 x 50%) +<br>\$20 (\$20 x 0%) +<br>\$13 (\$20 x 65%) | \$8                        |

Note: The figures above depict the tax payments associated with a firm with excess foreign tax credits that receives both export income and dividend repatriations from foreign subsidiaries. In the top row, there is no foreign source allocation of export income. As a result, the firm has \$15 ( $100 \times (50\% - 35\%)$ ) in excess foreign tax credits. In the second row, foreign source allocation of half of export income allows the exporter with excess foreign tax credits not to pay taxes on the portion of export income allocated to foreign source. It is important to note that U.S. allocation rules have no effect on foreign tax liabilities.

**Table 2**  
**Variable Summary Statistics, Entire Sample**

|  | <u>Mean</u> | <u>Median</u> | <u>Standard<br/>Deviation</u> | <u>No. of<br/>Obs.</u> |
|--|-------------|---------------|-------------------------------|------------------------|
| Abnormal Returns, 11/18/97                                     | (0.0046)    | (0.0012)      | 0.0376                        | 648                    |
| Ratio of Exports to Sales, 1997                                | 0.1630      | 0.1144        | 0.1772                        | 690                    |
| Ratio of NOLs to Sales, 1997                                   | 0.2900      | 0.0000        | 2.6544                        | 647                    |
| Interaction of NOLs and Export Ratio                           | 0.0573      | 0.0000        | 0.5063                        | 647                    |
| Ratio of Foreign Assets to Total Assets, 1997                  | 0.0997      | 0.0000        | 0.1700                        | 691                    |
| Interaction of Foreign Asset Ratio and Export Ratio            | 0.0117      | 0.0000        | 0.0298                        | 690                    |
| Foreign Tax Rate, 1997   | 0.3397      | 0.3323        | 0.2510                        | 202                    |
| Interaction of Foreign Tax Rate and Export Ratio               | 0.0416      | 0.0251        | 0.0609                        | 202                    |
| Average Pretax Profit Margin, 1992-1998                        | 0.0579      | 0.0662        | 0.1200                        | 202                    |
| Interaction of Pretax Profit Margin and Export Ratio           | 0.0074      | 0.0041        | 0.0297                        | 202                    |
| Log Total Assets, 1997   | 5.0835      | 4.9114        | 2.0658                        | 648                    |
| Interaction of Foreign Asset Ratio, Export Ratio and NOL Ratio | 0.0015      | 0.0000        | 0.0305                        | 647                    |
| Interaction of NOL Ratio, Export Ratio and Foreign Tax Rate    | 0.0015      | 0.0000        | 0.0146                        | 202                    |
| Industry Ratio of U.S. Exports to World Trade, 1997            | 0.1423      | 0.1401        | 0.0649                        | 141                    |
| Interaction of Industry Trade Share Ratio and Export Ratio     | 0.0358      | 0.0255        | 0.0379                        | 141                    |

Note: Abnormal returns on November 18, 1997 control for the effect of stock market and exchange rate movements on that day. "Ratio of Exports to Sales, 1997" is the ratio of exports to total sales in 1997. "Ratio of NOLs to Sales, 1997" is the ratio of net-operating losses to sales in 1997. "Interaction of NOLs and Export Ratio" is the product of "Ratio of Exports to Sales, 1997" and Ratio of NOLs to Sales, 1997. "Ratio of Foreign Assets to Total Assets, 1997" is the ratio of foreign assets to total assets. "Interaction of Foreign Asset Ratio and Export Ratio" is the product of "Ratio of Exports to Sales, 1997" and "Ratio of Foreign Assets to Total Assets, 1997." "Foreign Tax Rate, 1997" is the ratio of foreign taxes paid to foreign pretax income. "Interaction of Foreign Tax Rate and Export Ratio" is the product of "Ratio of Exports to Sales, 1997" and "Foreign Tax Rate, 1997." "Average Pretax Profit Margin, 1992-1998" is the average of the annual ratios of total pretax profits to total sales from 1992 to 1998. "Interaction of Pretax Profit Margin and Export Ratio" is the product of "Average Pretax Profit Margin, 1992-1998" and "Ratio of Exports to Sales, 1997." "Log Total Assets, 1997" is the natural logarithm of total assets in 1997. "Interaction of Foreign Asset Ratio, Export Ratio, and NOL Ratio" is the product of "Ratio of Exports to Sales, 1997," "Ratio of Foreign Assets to Total Assets," and "Ratio of NOLs to Sales, 1997." "Interaction of NOL Ratio, Export Ratio and Foreign Tax Rate" is the product of "Ratio of Exports to Sales, 1997," "Foreign Tax Rate, 1997," and "Ratio of NOLs to Sales, 1997." "Industry Ratio of U.S. Exports to World Trade, 1997" is the share of world trade in a firm's four-digit SIC grouping that is comprised of by U.S. firms in the overall sample. "Interaction of Industry Trade Share Ratio and Export Ratio" is the product of Industry Ratio of U.S. Exports to World Trade, 1997" and "Ratio of Exports to Sales, 1997."

**Table 3**  
**Variable Means by Exporting Propensity**

|   | <u>1st Quartile</u> | <u>2nd Quartile</u> | <u>3rd Quartile</u> | <u>4th Quartile</u> |
|---|---------------------|---------------------|---------------------|---------------------|
| Ratio of Exports to Sales, 1997                                   | 0.0056              | 0.0730              | 0.1625              | 0.4113              |
| Abnormal Returns, 11/18/97  | -0.0021             | -0.0009             | -0.0052             | -0.0100             |
| Abnormal Returns,<br>11/11/1997 - 11/25/97                        | -0.0235             | -0.0314             | -0.0427             | -0.0605             |
| Ratio of NOLs to Sales, 1997                                      | 0.5285              | 0.0952              | 0.1166              | 0.4465              |
| Interaction of NOLs and Export<br>Ratio                           | 0.0059              | 0.0076              | 0.0161              | 0.2104              |
| Ratio of Foreign Assets to Total<br>Assets, 1997                  | 0.1059              | 0.1368              | 0.1091              | 0.0484              |
| Interaction of Foreign Asset<br>Ratio and Export Ratio            | 0.0008              | 0.0103              | 0.0171              | 0.0188              |
| Foreign Tax Rate, 1997  | 0.3664              | 0.3971              | 0.3169              | 0.2585              |
| Interaction of Foreign Tax<br>Rate and Export Ratio               | 0.0031              | 0.0278              | 0.0482              | 0.0964              |
| Average Pretax Profit<br>Margin, 1992-1998                        | -0.0209             | -0.0805             | 0.0008              | -0.1488             |
| Interaction of Pretax Profit<br>Margin and Export Ratio           | -0.0006             | -0.0075             | 0.0008              | -0.0889             |
| Log Total Assets, 1997  | 5.4840              | 5.4246              | 5.0875              | 4.3152              |
| Interaction of Foreign Asset Ratio,<br>Export Ratio and NOL Ratio | 0.0001              | 0.0002              | 0.0004              | 0.0055              |
| Interaction of NOL Ratio,<br>Export Ratio and Foreign Tax Rate    | 0.0000              | 0.0002              | 0.0011              | 0.0061              |
| Industry Ratio of U.S. Exports to<br>World Trade, 1997            | 0.0963              | 0.1229              | 0.1546              | 0.1589              |
| Interaction of Industry Trade<br>Share Ratio and Export Ratio     | 0.0007              | 0.0089              | 0.0254              | 0.0697              |

Note: The table displays variable means by quartile of export to sales ratio, the "first quartile" corresponding to firms with the lowest export to sales ratios, and the "fourth quartile" firms with the highest export to sales ratios. "Ratio of Exports to Sales, 1997" is the ratio of exports to total sales in 1997. Abnormal returns on November 18, 1997, and for November 11-25, 1997 control for the effect of stock market and exchange rate movements on that day. "Ratio of NOLs to Sales, 1997" is the ratio of net-operating losses to sales in 1997. "Interaction of NOLs and Export Ratio is the product of "Ratio of Exports to Sales, 1997" and Ratio of NOLs to Sales, 1997. "Ratio of Foreign Assets to Total Assets, 1997" is the ratio of foreign assets to total assets. "Interaction of Foreign Asset Ratio and Export Ratio is the product of "Ratio of Exports to Sales, 1997" and "Ratio of Foreign Assets to Total Assets, 1997. "Foreign Tax Rate, 1997" is the ratio of foreign taxes paid to foreign pretax income. "Interaction of Foreign Tax Rate and Export Ratio" is the product of "Ratio of Exports to Sales, 1997" and "Foreign Tax Rate, 1997." "Average Pretax Profit Margin, 1992-1998" is the average of the annual ratios of total pretax profits to total sales from 1992 to 1998. "Interaction of Pretax Profit Margin and Export Ratio" is the product of "Average Pretax Profit Margin, 1992-1998" and "Ratio of Exports to Sales, 1997." "Log Total Assets, 1997" is the natural logarithm of total assets in 1997. "Interaction of Foreign Asset Ratio, Export Ratio, and NOL Ratio" is the product of "Ratio of Exports to Sales, 1997," "Ratio of Foreign Assets to Total Assets," and "Ratio of NOLs to Sales, 1997." "Interaction of NOL Ratio, Export Ratio and Foreign Tax Rate" is the product of "Ratio of Exports to Sales, 1997," "Foreign Tax Rate, 1997," and "Ratio of NOLs to Sales, 1997." Industry Ratio of U.S. Exports to World Trade, 1997" is the share of world trade in a firm's four-digit SIC grouping that is comprised of by U.S. firms in the overall sample. "Interaction of Industry Trade Share Ratio and Export Ratio" is the product of Industry Ratio of U.S. Exports to World Trade, 1997" and "Ratio of Exports to Sales, 1997."

**Table 4**  
**Determinants of Abnormal Returns on November 18, 1997**

| Dependent Variable: One Day Abnormal Return from Two-Factor Model |                     |                     |                     |                     |                     |                     |                     |
|---|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
|   | (1)                 | (2)                 | (3)                 | (4)                 | (5)                 | (6)                 | (7)                 |
| Constant  | -0.0013<br>(0.0019) | -0.0010<br>(0.0019) | -0.0007<br>(0.0019) | 0.0000<br>(0.0022)  | 0.0011<br>(0.0024)  | -0.0016<br>(0.0057) | -0.0018<br>(0.0057) |
| Ratio of Exports<br>to Sales, 1997                                | -0.0198<br>(0.0114) | -0.0193<br>(0.0115) | -0.0222<br>(0.0120) | -0.0232<br>(0.0119) | -0.0292<br>(0.0143) | -0.0283<br>(0.0137) | -0.0280<br>(0.0137) |
| Ratio of NOLs<br>to Sales, 1997                                   |                     | -0.0012<br>(0.0004) | -0.0016<br>(0.0002) | -0.0016<br>(0.0002) | -0.0017<br>(0.0002) | -0.0016<br>(0.0002) | -0.0015<br>(0.0002) |
| Interaction of NOLs<br>and Export Ratio                           |                     |                     | 0.0045<br>(0.0021)  | 0.0045<br>(0.0021)  | 0.0048<br>(0.0021)  | 0.0049<br>(0.0021)  | 0.0033<br>(0.0024)  |
| Ratio of Foreign Assets<br>to Total Assets, 1997                  |                     |                     |                     | -0.0068<br>(0.0067) | -0.0175<br>(0.0095) | -0.0200<br>(0.0108) | -0.0193<br>(0.0108) |
| Interaction of Foreign Asset<br>Ratio and Export Ratio            |                     |                     |                     |                     | 0.0943<br>(0.0635)  | 0.0927<br>(0.0625)  | 0.0815<br>(0.0618)  |
| Log Total Assets, 1997  |                     |                     |                     |                     |                     | 0.0006<br>(0.0010)  | 0.0006<br>(0.0010)  |
| Interaction of Foreign Asset Ratio,<br>Export Ratio and NOL Ratio |                     |                     |                     |                     |                     |                     | 0.0627<br>(0.0208)  |
| No. Obs.  | 647                 | 647                 | 647                 | 647                 | 647                 | 647                 | 647                 |
| R-Squared   | 0.0084              | 0.0157              | 0.0182              | 0.0192              | 0.0224              | 0.0232              | 0.0254              |

Note: The dependent variable in all specifications is the abnormal return on November 18, 1997, controlling for the effect of stock market and exchange rate movements on that day. "Ratio of Exports to Sales, 1997" is the ratio of exports to total sales in 1997. "Ratio of NOLs to Sales, 1997" is the ratio of net-operating losses to sales in 1997. "Interaction of NOLs and Export Ratio" is the product of "Ratio of Exports to Sales, 1997" and "Ratio of NOLs to Sales, 1997." "Ratio of Foreign Assets to Total Assets, 1997" is the ratio of foreign assets to total assets. "Interaction of Foreign Asset Ratio and Export Ratio" is the product of "Ratio of Exports to Sales, 1997" and "Ratio of Foreign Assets to Total Assets, 1997." "Log Total Assets, 1997" is the natural logarithm of total assets in 1997. "Interaction of Foreign Asset Ratio, Export Ratio, and NOL Ratio" is the product of "Ratio of Exports to Sales, 1997," "Ratio of Foreign Assets to Total Assets," and "Ratio of NOLs to Sales, 1997." Heteroskedasticity-consistent standard errors are in parentheses.

**Table 5**  
**Foreign Tax Credits and Abnormal Returns on November 18, 1997**

| Dependent Variable: One Day Abnormal Return from Two-Factor Model |                     |                     |                     |                     |                     |                     |
|---|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
|   | (1)                 | (2)                 | (3)                 | (4)                 | (5)                 | (6)                 |
| Constant  | -0.0101<br>(0.0051) | -0.0037<br>(0.0044) | -0.0056<br>(0.0044) | -0.0078<br>(0.0054) | -0.0112<br>(0.0077) | -0.0117<br>(0.0077) |
| Ratio of Exports to Sales, 1997                                   | 0.0144<br>(0.0174)  | -0.0241<br>(0.0156) | -0.0193<br>(0.0150) | -0.0079<br>(0.0193) | -0.0066<br>(0.0194) | 0.0048<br>(0.0190)  |
| Foreign Tax Rate, 1997  | 0.0128<br>(0.0099)  | -0.0083<br>(0.0103) | -0.0024<br>(0.0100) | -0.0026<br>(0.0099) | -0.0035<br>(0.0098) | -0.0005<br>(0.0098) |
| Interaction of Foreign Tax Rate and Export Ratio                  |                     | 0.1509<br>(0.0593)  | 0.0996<br>(0.0502)  | 0.0992<br>(0.0508)  | 0.1004<br>(0.0507)  | 0.0336<br>(0.0447)  |
| Ratio of NOLs to Sales, 1997                                      |                     |                     | 0.0193<br>(0.0684)  | 0.0200<br>(0.0695)  | 0.0220<br>(0.0696)  | 0.1371<br>(0.1049)  |
| Interaction of NOLs and Export Ratio                              |                     |                     | 0.2245<br>(0.2436)  | 0.2175<br>(0.2449)  | 0.2204<br>(0.2464)  | -0.5250<br>(0.4819) |
| Ratio of Foreign Assets to Total Assets, 1997                     |                     |                     |                     | 0.0092<br>(0.0133)  | 0.0085<br>(0.0136)  | 0.0044<br>(0.0139)  |
| Interaction of Foreign Asset Ratio and Export Ratio               |                     |                     |                     | -0.0561<br>(0.0677) | -0.0599<br>(0.0677) | -0.0550<br>(0.0682) |
| Log Total Assets, 1997  |                     |                     |                     |                     | 0.0006<br>(0.0009)  | 0.0007<br>(0.0009)  |
| Interaction of NOL Ratio, Export Ratio and Foreign Tax Rate       |                     |                     |                     |                     |                     | 0.8377<br>0.3085    |
| No. Obs.  | 202                 | 202                 | 202                 | 202                 | 202                 | 202                 |
| R-Squared   | 0.0198              | 0.0781              | 0.1428              | 0.1460              | 0.1478              | 0.1959              |

Note: The dependent variable in all specifications is the abnormal return on November 18, 1997, controlling for the effect of stock market and exchange rate movements on that day. "Ratio of Exports to Sales, 1997" is the ratio of exports to total sales in 1997. "Foreign Tax Rate, 1997" is the ratio of foreign taxes paid to foreign pretax income. "Interaction of Foreign Tax Rate and Export Ratio" is the product of "Ratio of Exports to Sales, 1997" and "Foreign Tax Rate, 1997." "Ratio of NOLs to Sales, 1997" is the ratio of net-operating losses to sales in 1997. "Interaction of NOLs and Export Ratio" is the product of "Ratio of Exports to Sales, 1997" and "Ratio of NOLs to Sales, 1997." "Ratio of Foreign Assets to Total Assets, 1997" is the ratio of foreign assets to total assets. "Interaction of Foreign Asset Ratio and Export Ratio" is the product of "Ratio of Exports to Sales, 1997" and "Ratio of Foreign Assets to Total Assets, 1997." "Log Total Assets, 1997" is the natural logarithm of total assets in 1997. "Interaction of NOL Ratio, Export Ratio, and Foreign Tax Rate" is the product of "Ratio of Exports to Sales, 1997," "Foreign Tax Rate," and "Ratio of NOLs to Sales, 1997." Heteroskedasticity-consistent standard errors are in parentheses.

**Table 6**  
**Firm Profitability and Abnormal Returns on November 18, 1997**

| Dependent Variable: One Day Abnormal Return from Two-Factor Model |                     |                     |                     |                     |                     |
|---|---------------------|---------------------|---------------------|---------------------|---------------------|
|   | (1)                 | (2)                 | (3)                 | (4)                 | (5)                 |
| Constant  | -0.0037<br>(0.0044) | -0.0041<br>(0.0051) | -0.0061<br>(0.0050) | -0.0088<br>(0.0057) | -0.0126<br>(0.0076) |
| Ratio of Exports<br>to Sales, 1997                                | -0.0241<br>(0.0156) | -0.0209<br>(0.0197) | -0.0179<br>(0.0183) | -0.0021<br>(0.0193) | -0.0008<br>(0.0192) |
| Foreign Tax Rate, 1997  | -0.0083<br>(0.0103) | -0.0109<br>(0.0100) | -0.0061<br>(0.0099) | -0.0065<br>(0.0098) | -0.0074<br>(0.0097) |
| Interaction of Foreign<br>Tax Rate and Export<br>Ratio            | 0.1509<br>(0.0593)  | 0.1766<br>(0.0514)  | 0.1335<br>(0.0532)  | 0.1364<br>(0.0528)  | 0.1383<br>(0.0526)  |
| Average Pretax Profit<br>Margin, 1992-1998                        |                     | 0.0241<br>(0.0265)  | 0.0266<br>(0.0265)  | 0.0294<br>(0.0260)  | 0.0259<br>(0.0262)  |
| Interaction of Pretax<br>Profit Margin and<br>Export Ratio        |                     | -0.2230<br>(0.1064) | -0.1733<br>(0.0983) | -0.1914<br>(0.0912) | -0.1878<br>(0.0916) |
| Ratio of NOLs<br>to Sales, 1997                                   |                     |                     | 0.0361<br>(0.0705)  | 0.0391<br>(0.0723)  | 0.0412<br>(0.0725)  |
| Interaction of NOLs<br>and Export Ratio                           |                     |                     | 0.1217<br>(0.2478)  | 0.0982<br>(0.2517)  | 0.0988<br>(0.2537)  |
| Ratio of Foreign Assets<br>to Total Assets, 1997                  |                     |                     |                     | 0.0109<br>(0.0134)  | 0.0103<br>(0.0137)  |
| Interaction of Foreign Asset<br>Ratio and Export Ratio            |                     |                     |                     | -0.0793<br>(0.0662) | -0.0834<br>(0.0660) |
| Log Total Assets, 1997  |                     |                     |                     |                     | 0.0007<br>(0.0009)  |
| No. Obs.  | 202                 | 202                 | 202                 | 202                 | 202                 |
| R-Squared   | 0.0781              | 0.1099              | 0.1566              | 0.1623              | 0.1644              |

Note: The dependent variable in all specifications is the abnormal return on November 18, 1997, controlling for the effect of stock market and exchange rate movements on that day. "Ratio of Exports to Sales, 1997" is the ratio of exports to total sales in 1997. "Foreign Tax Rate, 1997" is the ratio of foreign taxes paid to foreign pretax income. "Interaction of Foreign Tax Rate and Export Ratio" is the product of "Ratio of Exports to Sales, 1997" and "Foreign Tax Rate, 1997." "Average Pretax Profit Margin, 1992-1998" is the average of the annual ratios of total pretax profits to total sales from 1992 to 1998. "Interaction of Pretax Profit Margin and Export Ratio" is the product of "Average Pretax Profit Margin, 1992-1998" and "Ratio of Exports to Sales, 1997." "Ratio of NOLs to Sales, 1997" is the ratio of net-operating losses to sales in 1997. "Interaction of NOLs and Export Ratio" is the product of "Ratio of Exports to Sales, 1997" and "Ratio of NOLs to Sales, 1997." "Ratio of Foreign Assets to Total Assets, 1997" is the ratio of foreign assets to total assets. "Interaction of Foreign Asset Ratio and Export Ratio" is the product of "Ratio of Exports to Sales, 1997" and "Ratio of Foreign Assets to Total Assets, 1997." "Log Total Assets, 1997" is the natural logarithm of total assets in 1997. Heteroskedasticity-consistent standard errors are in parentheses.

**Appendix Table 1**  
**Determinants of Abnormal Returns, All Event Dates, including foreign tax variables**

|  | Dependent Variable: One Day Abnormal Return from Two-Factor Model |                     |                     |                     |                     |                     |                     |                     |
|--|---|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
|  | (1)   | (2)                 | (3)                 | (4)                 | (5)                 | (6)                 | (7)                 | (8)                 |
|  | 18-Nov-97   | 17-Dec-97           | 10-Feb-98           | 23-Jul-99           | 6-Aug-99            | 17-Sep-99           | 28-Oct-99           | 2-Nov-99            |
|  | Charges   | Inconclusive        | Inconclusive        | Interim Report      | Joint Review        | WTO                 | American            | Appeal              |
|  | Filed   | Consultations       | Consultations       | Issued              | Request             | Ruling              | Appeal              | Withdrawal          |
|  | (-)   | (-)                 | (-)                 | (-)                 | (+)                 | (-)                 | (+)                 | (-)                 |
| Constant   | -0.0112<br>(0.0077)   | 0.1040<br>(0.0093)  | -0.0073<br>(0.0104) | 0.0064<br>(0.0102)  | 0.0117<br>(0.0105)  | -0.1090<br>(0.0098) | 0.0098<br>(0.0178)  | 0.0384<br>(0.0176)  |
| Ratio of Exports<br>to Sales, 1997                     | -0.0066<br>(0.0194)   | -0.0189<br>(0.0254) | -0.0087<br>(0.0312) | 0.0069<br>(0.0237)  | 0.0133<br>(0.0257)  | 0.0199<br>(0.0339)  | -0.0554<br>(0.0466) | -0.0574<br>(0.0566) |
| Foreign Tax Rate, 1997                                 | -0.0035<br>(0.0098)   | -0.0176<br>(0.0121) | 0.0025<br>(0.0104)  | -0.0295<br>(0.0111) | -0.0109<br>(0.0131) | -0.0037<br>(0.0128) | -0.0365<br>(0.0169) | -0.0453<br>(0.0221) |
| Interaction of Foreign Tax<br>Rate and Export Ratio    | 0.1004<br>(0.0507)  | 0.1099<br>(0.0549)  | -0.0129<br>(0.0617) | 0.1090<br>(0.0616)  | 0.0627<br>(0.0675)  | -0.0054<br>(0.0645) | 0.2926<br>(0.0100)  | 0.2873<br>(0.1445)  |
| Ratio of NOLs<br>to Sales, 1997                        | 0.0220<br>(0.0696)  | 0.1151<br>(0.0959)  | -0.1073<br>(0.0802) | 0.0509<br>(0.0573)  | 0.0532<br>(0.0595)  | 0.0422<br>(0.0452)  | 0.0801<br>(0.1695)  | 0.0001<br>(0.1498)  |
| Interaction of NOLs<br>and Export Ratio                | 0.2204<br>(0.2464)  | -0.3403<br>(0.3416) | 0.4785<br>(0.3214)  | -0.2708<br>(0.2092) | -0.3839<br>(0.2335) | 0.0431<br>(0.1428)  | -0.5044<br>(0.5524) | -0.2108<br>(0.5215) |
| Ratio of Foreign Assets<br>to Total Assets, 1997       | 0.0085<br>(0.0136)  | 0.0053<br>(0.0160)  | -0.0198<br>(0.0195) | -0.0033<br>(0.0144) | -0.0065<br>(0.0192) | -0.0058<br>(0.0142) | 0.0350<br>(0.0416)  | 0.0141<br>(0.0271)  |
| Interaction of Foreign Asset<br>Ratio and Export Ratio | -0.0599<br>(0.0677)   | -0.1388<br>(0.0720) | 0.1092<br>(0.0921)  | -0.0556<br>(0.0994) | -0.0588<br>(0.0995) | 0.0100<br>(0.0944)  | -0.2619<br>(0.1821) | -0.2566<br>(0.2052) |
| Log Total Assets, 1997                                 | 0.0006<br>(0.0009)  | -0.0001<br>(0.0012) | 0.0018<br>(0.0014)  | 0.0001<br>(0.0010)  | -0.0010<br>(0.0011) | 0.0008<br>(0.0011)  | -0.0019<br>(0.0025) | -0.0017<br>(0.0020) |
| No. Obs.   | 202   | 202                 | 202                 | 196                 | 196                 | 194                 | 190                 | 190                 |
| R-Squared  | 0.1478  | 0.0725              | 0.0437              | 0.0641              | 0.0397              | 0.0355              | 0.0759              | 0.0996              |

Note: The dependent variable in all specifications is the abnormal return on November 18, 1997, controlling for the effect of stock market and exchange rate movements on that day. "Ratio of Exports to Sales, 1997" is the ratio of exports to total sales in 1997. "Foreign Tax Rate, 1997" is the ratio of foreign taxes paid to foreign pretax income. "Interaction of Foreign Tax Rate and Export Ratio" is the product of "Ratio of Exports to Sales, 1997" and "Foreign Tax Rate, 1997." "Ratio of NOLs to Sales, 1997" is the ratio of net-operating losses to sales in 1997. "Interaction of NOLs and Export Ratio" is the product of "Ratio of Exports to Sales, 1997" and "Ratio of NOLs to Sales, 1997." "Ratio of Foreign Assets to Total Assets, 1997" is the ratio of foreign assets to total assets. "Interaction of Foreign Asset Ratio and Export Ratio" is the product of "Ratio of Exports to Sales, 1997" and "Ratio of Foreign Assets to Total Assets, 1997." "Log Total Assets, 1997" is the natural logarithm of total assets in 1997. Heteroskedasticity-consistent standard errors are in parentheses.

**Appendix Table 2: Correlations of Excess Returns for Firms without and with NOLs**

|                                | 18-Nov-97<br>(-) | 17-Dec-97<br>(-) | 10-Feb-98<br>(-) | 23-Jul-99<br>(-) | 6-Aug-99<br>(+) | 17-Sep-99<br>(-) | 28-Oct-99<br>(+) | 2-Nov-99<br>(-) |
|--------------------------------|------------------|------------------|------------------|------------------|-----------------|------------------|------------------|-----------------|
| 18-Nov-97                      | 1.0000           |                  |                  |                  |                 |                  |                  |                 |
| Charges Filed (-)              | 1.0000           |                  |                  |                  |                 |                  |                  |                 |
| 17-Dec-97                      | 0.0281           | 1.0000           |                  |                  |                 |                  |                  |                 |
| Inconclusive Consultations (-) | 0.0727           | 1.0000           |                  |                  |                 |                  |                  |                 |
| 10-Feb-98                      | 0.0921**         | 0.0114           | 1.0000           |                  |                 |                  |                  |                 |
| Inconclusive Consultations (-) | -0.0030          | -0.0260          | 1.0000           |                  |                 |                  |                  |                 |
| 23-Jul-99                      | 0.0821*          | 0.0159           | -0.0131          | 1.0000           |                 |                  |                  |                 |
| Interim Report Issued          | -0.1443*         | -0.0268          | 0.0100           | 1.0000           |                 |                  |                  |                 |
| 6-Aug-99                       | -0.0896*         | 0.0188           | -0.0465          | -0.0301          | 1.0000          |                  |                  |                 |
| Joint Review Request (+)       | 0.0934           | 0.0574           | -0.0192          | 0.0730           | 1.0000          |                  |                  |                 |
| 17-Sep-99                      | -0.0596          | -0.0899*         | -0.0006          | -0.0430          | -0.0087         | 1.0000           |                  |                 |
| WTO Ruling (-)                 | 0.0733           | -0.0700          | 0.0505           | -0.0199          | -0.0197         | 1.0000           |                  |                 |
| 28-Oct-99                      | -0.0729          | -0.0112          | -0.0083          | 0.0128           | -0.0702         | 0.1136**         | 1.0000           |                 |
| American Appeal (+)            | 0.0505           | -0.0057          | -0.1069          | 0.0993           | 0.0553          | -0.0988          | 1.0000           |                 |
| 2-Nov-99                       | 0.0051           | 0.0072           | 0.0671           | -0.0532          | 0.0745          | -0.0609          | 0.0681           | 1.0000          |
| Appeal Withdrawal (-)          | -0.0239          | -0.1655**        | -0.1089          | -0.0847          | -0.0869         | -0.0174          | 0.0401           | 1.0000          |

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Note: The top number in each cell represents the correlation of abnormal returns for firms without NOLs, while the bottom number represents the correlations of abnormal returns for firms with NOLs. One asterisk denotes significance at the ninety percent confidence level and two asterisks denote significance at the ninety-five percent level.

**Appendix Table 3: Correlations of Abnormal Returns, November 18, 1997 and July 23, 1999**

|                                     |                | With NOLS      |                |                |               |                | Without NOLS   |                |                |                |    |
|-------------------------------------|----------------|----------------|----------------|----------------|---------------|----------------|----------------|----------------|----------------|----------------|----|
| <b>First Quartile of Exporters</b>  |                | -2             | -1             | 18-Nov-97      | +1            | +2             | -2             | -1             | 18-Nov-97      | +1             | +2 |
| -2                                  | -0.2935        | <i>0.4514</i>  | 0.1494         | 0.1171         | 0.1382        | -0.1020        | 0.0444         | 0.1369         | -0.0961        | -0.0137        |    |
| -1                                  | 0.0144         | -0.1478        | <i>-0.4614</i> | 0.2411         | <i>0.3245</i> | 0.1460         | <i>-0.1746</i> | 0.0151         | 0.0132         | -0.1056        |    |
| 23-Jul-99                           | 0.1226         | -0.3213        | <b>-0.4946</b> | -0.0741        | 0.1181        | 0.0463         | -0.1292        | <b>-0.0371</b> | 0.0330         | 0.0217         |    |
| +1                                  | -0.0209        | 0.2495         | -0.1242        | 0.2709         | <i>0.5493</i> | -0.0980        | <i>-0.2584</i> | <i>0.2447</i>  | 0.0379         | -0.3775        |    |
| +2                                  | -0.2608        | <i>0.4321</i>  | 0.1215         | <i>0.3910</i>  | 0.0611        | -0.0019        | -0.1061        | -0.0378        | -0.0685        | 0.0740         |    |
| <b>Second Quartile of Exporters</b> |                | -2             | -1             | 18-Nov-97      | +1            | +2             | -2             | -1             | 18-Nov-97      | +1             | +2 |
| -2                                  | -0.2333        | <i>-0.3091</i> | -0.0705        | -0.0051        | -0.1722       | <i>-0.1701</i> | 0.0819         | <i>-0.2617</i> | <i>-0.2281</i> | -0.0905        |    |
| -1                                  | <i>0.3424</i>  | -0.1778        | 0.0969         | -0.2159        | <i>0.4694</i> | <i>-0.2651</i> | -0.1087        | -0.1126        | 0.0329         | <i>-0.1765</i> |    |
| 23-Jul-99                           | 0.1553         | 0.1894         | <b>-0.2930</b> | <i>0.4633</i>  | -0.0808       | 0.0190         | <i>0.1843</i>  | <b>0.2610</b>  | -0.0068        | 0.0486         |    |
| +1                                  | 0.1035         | -0.2182        | -0.0184        | -0.1607        | 0.1633        | <i>-0.1973</i> | -0.0266        | -0.0213        | -0.0140        | 0.0183         |    |
| +2                                  | 0.1569         | -0.0977        | 0.0221         | -0.0055        | -0.2413       | -0.0626        | -0.0500        | <i>-0.1676</i> | 0.0296         | -0.0847        |    |
| <b>Third Quartile of Exporters</b>  |                | -2             | -1             | 18-Nov-97      | +1            | +2             | -2             | -1             | 18-Nov-97      | +1             | +2 |
| -2                                  | <i>-0.4122</i> | -0.0005        | -0.1556        | -0.0876        | 0.1591        | -0.0407        | <i>-0.1981</i> | -0.0452        | <i>0.2714</i>  | <i>-0.3090</i> |    |
| -1                                  | -0.0559        | -0.0659        | -0.0617        | 0.1074         | -0.0926       | 0.0586         | 0.1013         | -0.0521        | 0.1401         | 0.0833         |    |
| 23-Jul-99                           | 0.0002         | <i>0.2796</i>  | <b>0.0782</b>  | <i>0.4038</i>  | -0.1417       | 0.0386         | -0.0035        | <b>0.0687</b>  | -0.0907        | <i>0.1691</i>  |    |
| +1                                  | -0.0844        | 0.0368         | 0.0393         | -0.1132        | 0.1002        | -0.1286        | -0.0710        | -0.0355        | -0.0984        | <i>0.2395</i>  |    |
| +2                                  | -0.0692        | -0.2070        | 0.0424         | <i>-0.3017</i> | <i>0.3370</i> | 0.1544         | <i>0.2004</i>  | -0.0476        | 0.0365         | -0.0322        |    |
| <b>Fourth Quartile of Exporters</b> |                | -2             | -1             | 18-Nov-97      | +1            | +2             | -2             | -1             | 18-Nov-97      | +1             | +2 |
| -2                                  | -0.0875        | 0.0213         | <i>0.3639</i>  | <i>-0.3707</i> | 0.0797        | 0.1137         | -0.0643        | <i>0.2276</i>  | -0.1968        | <i>0.1742</i>  |    |
| -1                                  | <i>-0.2925</i> | 0.1651         | -0.1876        | -0.0864        | 0.2282        | -0.1580        | -0.0071        | -0.1010        | 0.0591         | -0.0279        |    |
| 23-Jul-99                           | -0.0316        | -0.1729        | <b>0.0068</b>  | <i>-0.5230</i> | 0.0658        | <i>0.3216</i>  | -0.0501        | <b>0.0494</b>  | 0.1173         | 0.0830         |    |
| +1                                  | 0.1270         | -0.2715        | <i>-0.2910</i> | <i>0.3119</i>  | 0.0289        | -0.1598        | -0.0219        | 0.0351         | -0.2655        | -0.0181        |    |
| +2                                  | -0.0033        | -0.1872        | -0.0421        | -0.0399        | 0.2253        | <i>-0.2349</i> | <i>0.2075</i>  | <i>-0.3508</i> | 0.0289         | 0.0797         |    |

Note: This table presents correlation coefficients for the abnormal returns of firms between the dates surrounding November 18, 1997 and July 23, 1999. The left column presents data for firms with net operating losses and the right column presents data for firms without net operating losses. The panels divide firms by their exporting propensity as defined by the ratio of firm exports to firm sales, so that the top panels ("First Quartile of Exporters") present data for firms with the lowest ratios of exports to sales. Columns and rows labelled "-1" present abnormal return correlations for the day before the indicated event date while "+2" present return correlations for two days after the indicated event date. Correlation coefficients presented in italics are significant at the ten percent level.

**Appendix Table 4**  
**U.S. Trade Shares and Abnormal Returns on November 18, 1997**

| Dependent Variable: One Day Abnormal Return from Two-Factor Model |                     |                     |                     |                     |                     |
|---|---------------------|---------------------|---------------------|---------------------|---------------------|
|   | (1)                 | (2)                 | (3)                 | (4)                 | (5)                 |
| Constant  | -0.0113<br>(0.0065) | -0.0083<br>(0.0065) | -0.0001<br>(0.0047) | -0.0101<br>(0.0062) | 0.0145<br>(0.0166)  |
| Industry Ratio of U.S. Exports to World Trade, 1997               | 0.0443<br>(0.0442)  | 0.0648<br>(0.0501)  |                     |                     | -0.1227<br>(0.0898) |
| Ratio of Exports to Sales, 1997                                   |                     | -0.0265<br>(0.0279) | -0.0593<br>(0.0389) | -0.0416<br>(0.0399) | -0.1065<br>(0.0549) |
| Interaction of Industry Trade Share Ratio and Export Ratio        |                     |                     | 0.2382<br>(0.1367)  | 0.3688<br>(0.2066)  | 0.6193<br>(0.4000)  |
| Foreign Tax Rate, 1997  |                     |                     |                     |                     | -0.0343<br>(0.0253) |
| Interaction of Foreign Tax Rate and Export Ratio                  |                     |                     |                     |                     | 0.1601<br>(0.0663)  |
| No. Obs.  | 131                 | 131                 | 131                 | 40                  | 40                  |
| R-Squared   | 0.0046              | 0.0201              | 0.0205              | 0.0656              | 0.1676              |

Note: The dependent variable in all specifications is the abnormal return on November 18, 1997, controlling for the effect of stock market and exchange rate movements on that day. "Industry Ratio of U.S. Exports to World Trade, 1997" is the share of world trade in a firm's four-digit SIC grouping that is comprised of by U.S. firms in the overall sample. "Ratio of Exports to Sales, 1997" is the ratio of exports to total sales in 1997. "Interaction of Industry Trade Share Ratio and Export Ratio" is the product of "Industry Ratio of U.S. Exports to World Trade, 1997" and "Ratio of Exports to Sales, 1997." "Foreign Tax Rate, 1997" is the ratio of foreign taxes paid to foreign pretax income. "Interaction of Foreign Tax Rate and Export Ratio" is the product of "Foreign Tax Rate, 1997" and "Ratio of Exports to Sales, 1997." Heteroskedasticity-consistent standard errors are in parentheses.