Talk softly but carry a big stick: transfer pricing penalties and the market valuation of Japanese multinationals in the United States

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Abstract
Corporate income tax law in OECD countries requires multinational enterprises (MNEs) to set their transfer prices according to the arm's length standard. In 1990 the United States (US) government introduced a transfer pricing penalty for cases where MNEs deviated substantially from this standard. More than two dozen other governments have followed suit. Our paper uses event study methodology to assess the impact of the US transfer pricing penalty on the stock market valuation of Japanese MNEs with US subsidiaries in the 1990s. We find that the penalty caused a drop in their cumulative market value of $56.1 billion, representing 12.6% of their 1997 market value.
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Introduction

> Nobody wants to pay taxes. No wonder, then, that so many companies spend so much effort trying to avoid them. Almost every big corporate scandal of recent years, from Enron to Parmalat, has involved tax-dodging in one form or another. (The Economist, 2004, 71)

Corporate income tax law in all OECD countries requires multinational enterprises (MNEs) to set their transfer prices according to the arm's length standard; that is, the external market or arm's length price that two unrelated firms would set for the same or similar product traded under the same or similar circumstances, as the product traded within the MNE (Eden, 1998, 2001). In 1990, the United States (US) government introduced a transfer pricing penalty – Internal Revenue Code §6662 – for cases where MNEs engage in transfer price manipulation (TPM), setting a transfer price that deviates significantly from the arm's length price. The US Congress approved the §6662 penalty partly in response to the widespread perception that foreign-owned, particularly Japanese, MNEs were paying little US tax (Inoue, 1990).

When first introduced, the penalty was broadly condemned by other OECD tax authorities, but over the past few years the policy has begun to spread. Ernst & Young (2004), for example, document the international tax policies of 46 countries in 2003; 27 of the

countries now have explicit transfer pricing penalty legislation modeled on the US legislation.

How important an issue is transfer pricing? In Ernst & Young's (2003, 7) most recent global transfer pricing survey, 86% of MNE parent and 93% of subsidiary respondents stated that transfer pricing was the most important international tax issue they currently face. The respondents noted that almost half their MNEs had been audited since 1999, and two-thirds expected to be audited within the next 2 years (Ernst & Young, 2003, 10). Of the MNEs that had been audited, one-third of the audits concluded with an adjustment (that is, the MNE owed more tax to the national tax authority). Tax penalties were threatened in one-third of these cases and actually imposed in one-sixth of them (Ernst & Young, 2003, 7). To quote Ernst & Young (2003, 15): 'If an MNE is subject to an adjustment as the result of a transfer pricing examination, there is almost a one-in-three chance of being threatened with a penalty, and a one-in-seven chance of actually having one imposed.'

Global dollar estimates for TPM are hard to come by. The US Department of the Treasury (1999, 3) estimated the annual loss in US income tax revenue due to TPM at $2.8 billion. Manufacturing accounted for one-half the estimated tax loss, followed by wholesale and retail trade; over half the estimated loss came, not surprisingly, from large corporations (US Department of the Treasury, 1999, 13). In terms of actual, not estimated, tax dollars, in fiscal year 2002, the US Internal Revenue Service (IRS) recommended $5.56 billion in transfer pricing adjustments (that is, additional income tax owed by the MNEs) and spent $15 million on direct examination costs (US Department of the Treasury, 2003, 10). Estimates of the impacts of the transfer pricing penalty are not available, but a recent IRS survey revealed that 31% of US MNEs were spending between $100,000 and $1 million dollars annually preparing the contemporaneous transfer pricing documentation required as a precondition to avoid being hit by the §6662 penalty (US Department of the Treasury, 2003). Moreover, even the threat of transfer pricing adjustments and penalties can affect a multinational's market valuation. Swatch, for example, saw its stock price drop by 11% on the Zurich stock exchange when two employees claimed to the US Labor Department that the Swiss MNE had used transfer price manipulation through its British Virgin Islands subsidiary to evade millions of dollars in taxes (Lopez, 2004).

These numbers suggest that both the threat and the reality of transfer pricing penalties should affect the strategies and market valuation of MNEs. The purpose of our paper is to address exactly that question: *How do transfer pricing penalties affect the behavior and profits of multinationals?* We develop a theoretical model analyzing the penalty's impact on MNE after-tax profits. We hypothesize that MNEs that engage in TPM should respond to the transfer pricing penalty either by continuing their existing pricing policies (and therefore risking being hit with the penalty), or by setting government-approved arm's length prices (and therefore paying more income taxes). We outline the circumstances under which MNEs would choose one or the other of these alternatives. In either case, the MNE's cash flows should fall, having a negative impact on the firm's stock market valuation.

We test our model using an event study of the stock market prices of American Depository Receipts (ADRs) of all Japanese multinationals with US subsidiaries over the 1990s. A brief history of the US transfer pricing penalty legislative process from 1989 to the present is used to isolate the critical dates for our event study. We follow the rigorous research methodology design for event studies laid out in MacKinlay (1997), McWilliams and Siegel (1997) and McWilliams *et al.* (1999).

Our results show a strong negative reaction to the penalty for Japanese stock market returns in the US, providing support for our theoretical model, even though there has been only one major penalty case to date. We estimate the impact of the §6662 legislation on the market value of the Japanese ADRs between 1990 and 1997 to be a cumulative loss of $56.1 billion (an average $7 billion dollars per year), which is 12.6% of the ADRs' market value at the end of the period. This drop in market value can be compared with US Treasury estimates, mentioned above, of $2.8 billion in annual forgone tax revenues due to TPM and $5.56 billion in recommended tax adjustments in 2002. Thus, the market value impact – on Japanese MNEs alone – appears to be larger than the US Treasury's estimates of forgone tax revenues.

We therefore conclude that the transfer pricing penalty – and even the threat of the penalty – can be punitive for targeted firms. The penalty discourages transfer price manipulation and reduces the MNEs' market value. Talking softly but carrying a big stick does encourage tax compliance, albeit at a very high cost in terms of lost market value.

Literature review

Economic theory suggests that MNEs will maximize global after-tax profits by shifting revenues to low-tax, and deductions to high-tax, jurisdictions (Horst, 1971). Manipulation of transfer prices is widely believed to be the primary route for such income shifting. There has been a large theoretical literature on transfer pricing responses to income tax differentials (Horst, 1971; Halperin and Srinidhi, 1987; Eden, 1998). Empirical studies by Grubert *et al.* (1993), Harris (1993), Harris *et al.* (1993), Klassen *et al.* (1993), Jacob (1996), Clausing (1998) and Collins *et al.* (1998), among others, suggest that high tax rates negatively affect volume and location of foreign direct investment (FDI), and encourage aggressive transfer pricing techniques. Hines (1999, 318) concludes that international tax avoidance is a 'successful activity', limited only by 'available opportunities and the enforcement activities of governments'.

Most of the empirical work on this topic has been macroeconomic in nature, using US foreign direct investment data. An alternative approach is to analyze the impact of tax policy changes on stock market prices, using event study methodology. Schipper *et al.* (1987), Cornett and Tehranian (1990), Malatesta and Thompson (1993), Barth *et al.* (1995) and Harper and Huth (1997), for example, measure the impacts of government tax and regulatory changes on firms' abnormal returns. As policy changes typically provide many possible event dates, it is critical to select those dates that (i) provide major new information and (ii) are unanticipated by the markets.

Three recent surveys of event study research (MacKinlay, 1997; McWilliams and Siegel, 1997; McWilliams *et al.*, 1999) argue that past researchers often paid inadequate attention to theory and research design issues, leading to spurious, overly optimistic results. The authors outline the necessary components of a 'good' event study design. In our paper, we follow the steps outlined by these authors, using event study methodology to provide an 'inverse test' of transfer price manipulation.

If foreign MNEs *did* manipulate transfer prices in order to artificially shift profits out of the US, then introduction of the penalty should reduce their incentive to manipulate transfer prices, causing a drop in cash flows and generating negative cumulative average returns (CARs). We therefore expect the market valuation of foreign MNEs with US subsidiaries to fall in response to the introduction of penalty legislation, and to fall furthest for those MNEs using aggressive transfer pricing techniques.

Theory development

We hypothesize that a transfer pricing penalty has two key effects: a direct effect and an indirect effect. The first effect is the penalty itself, which is an extra, nondeductible tax levied as some percentage α of the MNE's profits. The penalty is not automatic, but depends on the extent of TPM as defined by the tax authority: that is, by the gap between the MNE's transfer price p and the tax authority's arm's length transfer price $\hat{W}$, multiplied by the volume of intrafirm trade X. The regulated transfer price, in practice, is not a single price but an arm's length range; however, in the interests of simplicity, we assume $\hat{W}$ is a fixed price.

The penalty is levied on top of the corporate income tax rate t on the MNE's profits. There is some probability Φ of a penalty being levied: the larger the extent of TPM, the more likely the assessment of a penalty. For simplicity, assume the penalty is triggered by a transfer pricing gap that exceeds some known percentage k of the arm's length price $\hat{W}$. The transfer pricing penalty $\maltese$ is therefore

$$\maltese = \Phi\alpha t(p - \hat{W})X \qquad (1)$$

which is positive if $\Phi > 0$ and $(p-\hat{W}) \geqslant k\hat{W}$, and zero if $\Phi = 0$ or if $(p-\hat{W}) < k\hat{W}$. Equation (1) suggests that the penalty will be larger, the higher the probability of assessment Φ, the higher the penalty tax rate α and corporate income tax rate t, the greater the degree of transfer price manipulation $(p-\hat{W})$, and the larger the volume of intrafirm trade X.

Second, if a penalty is assessed, the tax authority replaces the MNE's transfer price p with the arm's length price $\hat{W}$ and restates the MNE's profits with the new transfer price.[1] The indirect effect of the penalty is the reassessment of income tax based on substituting the arm's length price $\hat{W}$ for the MNE's transfer price p. The indirect effect also depends positively upon Φ, t and X.

Where the MNE's chosen transfer price p differs from the regulated price $\hat{W}$, the MNE pays an additional tax if the tax authority audits the MNE and finds that the transfer pricing differential exceeds the minimum allowable gap. By staying inside the arm's length range set by the tax authority, the MNE avoids the penalty but reduces its profits from manipulating the transfer price.

Thus, the penalty reduces the MNE's marginal after-tax profitability. Our first hypothesis therefore is:

> H1: The transfer pricing penalty reduces the net profitability of the MNE.

In the absence of the penalty, the MNE would simply overinvoice its transfer price whenever the US corporate income tax rate was higher than the foreign tax rate. With the penalty, however, the incentive to manipulate the transfer price is reduced for two reasons. First, as Φ rises, the MNE is less willing to take chances with its transfer pricing policy. Second, the higher· the penalty rate α the less likely the MNE is to overinvoice because the cost of the penalty rises. In effect, the MNE balances the tax-saving gains from transfer price manipulation against the probability and size of the penalty. The penalty provides an additional constraint on the MNE's transfer pricing range, reducing its overall net profitability from transfer price manipulation. Our second hypothesis is:

> H2: The higher the probability of penalty assessment and/or the higher the penalty rate, the less likely is the MNE to engage in transfer price manipulation.

There is a third effect to the transfer pricing penalty. Most tax authorities also require the MNE to contemporaneously collect transfer pricing documents, in both primary and secondary forms, and to make these available to the tax authority on request. Contemporaneous documentation is a necessary, but not sufficient, condition to avoid the penalty. Therefore, there are administrative costs attached to the penalty regulations, which should be included in a full model.[2] Let C_D represent the administrative costs of complying with the penalty regulations, and assume C_D is negatively related to the probability of the penalty. The MNE's optimal transfer price is now affected because documentation reduces the probability of the penalty being levied, all other things being equal, and thus permits a higher transfer price: that is, documentation reduces the likely penalty costs and encourages greater transfer price manipulation. This suggests our third hypothesis:

> H3: Because contemporaneous documentation reduces the probability of a tax penalty, it has the unintended consequence of encouraging transfer price manipulation.

A brief history of the §6662 transfer pricing penalty

Tax penalties have been part of the US income tax code for many years, but they were aimed at severe cases of tax evasion, and were seldom levied. Congress, cognizant ·of the IRS's apparent reluctance to levy tax penalties, consolidated all the different penalties on 19 December 1989 into §6662. In 1990 the US government introduced added an accuracy-related penalty for cases where the MNE's transfer prices deviated significantly from IRS-approved arm's length transfer price.[3]

The transfer pricing penalty was introduced for two reasons. The first rationale was IRS experience in transfer pricing audits (Lowell *et al.*, 1994, 352). The Service had found that most taxpayers had no documentation, and were unable to explain their transfer prices at the time of an audit, causing increased time and costs for the Service. The IRS believed that taxpayer compliance would improve if an inaccuracy penalty were introduced.[4]

A second reason was the widespread perception that foreign MNEs were underpaying their US taxes. The *Wall Street Journal* (Wall Street Journal, <u>20 February 1990</u>) interviewed an IRS official who noted that, ·while inward FDI and sales revenues had surged in the 1980s, US tax payments by foreign-owned subsidiaries had not grown (Stout, 1990). (Underlined events are considered significant and tested in the event study below.) He also noted that more than 36,000 foreign-owned companies filing US tax returns reported negative taxable income, and that the IRS was stepping up its surveillance of foreign-owned MNEs. This was documented on <u>10 July 1990</u>, when the US Ways and Means Committee conducted hearings (known as the Pickle ·hearings after its chair) into tax compliance by foreign subsidiaries in the US. An IRS report, based on an investigation of 36 large foreign-owned subsidiaries, concluded that most had paid little or no US taxes over a 10-year period (Heck, 1990; Inoue, 1990). About half the subsidiaries had Japanese parents. The study concluded that inflated transfer prices for goods purchased from foreign parents and the performance of functions not fully charged to foreign parents were the main causes for the low US taxes. A former US Treasury official was quoted as saying, 'For most Japanese firms operating in the US, it's a question of when, not if, they'll be audited and investigated by the IRS' (Inoue, 1990).

These events provided support for congressional critics who contended that foreign firms were

manipulating their books to avoid paying US tax. As a result, Congress developed legislation for a new transfer pricing penalty (Schmedel, 1990). On 5 November 1990, as part of the Revenue Reconciliation Act, §6662(e) was added to the Income Tax Code, creating a penalty for transfer pricing mis-valuations. The 1990 legislation differentiated between a substantial valuation misstatement (SVM) and a gross valuation misstatement (GVM). With a US federal tax rate of 34%, the penalty raised the effective US tax rate to 41% for an SVM (1.2 × 34) or 48% for a GVM (1.4 × 34). An escape clause from the penalty was provided in §6664(c), requiring the taxpayer to show that there was reasonable cause for the underpayment and that the taxpayer had acted in good faith with respect to the transfer price. As part of RRA '90, Congress directed the IRS to develop regulations to implement the §6662 legislation.

The IRS issued its first tax penalty regulations, covering everything but the transfer pricing penalty on **4 March 1991**, with essentially unchanged final regulations issued on 30 December 1991. However, it took the IRS until **13 January 1993** to prepare and release its proposed transfer pricing penalty regulations for §6662(e).[5] Issued along with the revised §482 temporary transfer pricing regulations, the penalty caused immediate controversy among US and foreign transfer pricing professionals. The most controversial issue was the 'reasonable cause and good faith' exemption in §6664(c). To qualify for the exemption, the taxpayer had to meet two tests: (i) contemporaneously document the transfer pricing methodology by the time taxes were filed, and provide the documentation to the IRS within 30 days of a request; and (ii) prove that the transfer pricing result, more likely than not, would be sustained on its merits in a transfer pricing audit.[6]

On **2 February 1994**, the IRS issued temporary §6662 regulations to take into account the changes introduced by RRA '93. The changes tightened the rules, introducing two classifications of documents (principal and background) required for contemporaneous documentation, and requiring the taxpayer to use a transfer pricing methodology that met the best method test of §482. On **17 March 1994**, the temporary regulations were amended to raise the disclosure standard from 'not frivolous' to 'reasonable basis', as required in RRA '93. On **8 July 1994** the §6662 regulations were updated to conform to the IRS final §482 regulations. The key change was to provide a complete list of all the principal and supporting documents required for

contemporaneous documentation. This was the last major change in the §6662 regulations.[7] The IRS formalized the penalty process by establishing a penalty oversight committee to ensure uniform application of §6662, on **11 March 1996**.

The first §6662 non-transfer pricing penalty (company unnamed) under the pre-1994 rules was announced by the IRS at a conference on 8 June 1996. The first transfer pricing penalty was announced on **17 September 1997**. The one, major transfer pricing penalty case to date has been *DHL*,[8] filed on **30 December 1998**, where the US Tax Court levied a 40% penalty for the undervaluation of DHL's sale of its trademark to a foreign related corporation, and a 20% penalty for failing to charge for the use of its trademark in earlier years. The total amount of §6662 penalties was $162.5 million.[9] Thus, nine years elapsed between December 1989, when Congress first consolidated the tax penalties into §6662, and December 1998 when the first significant transfer pricing penalty was upheld in Tax Court. Since that time there have been no publicly discussed, major transfer pricing penalties announced by the IRS. Our historical analysis therefore stops with the DHL case.

Data and methods

As our historical review shows, Japanese MNEs were perceived by the IRS and US Congress to be the most serious tax underpayers in the 1990s.[10] Japanese firms were targeted in the Pickle hearings in 1990. Hufbauer and van Rooij (1992, 116–117) calculated that the 1990 net return on sales in the US was 3.4% for US MNEs, but only 0.1% for Japanese MNEs. Eden (1998, 373) reported an operating profit to gross income ratio of 7.1% for US majority-owned foreign affiliates in Japan compared with −0.2% for Japanese affiliates in the US. In the early 1990s, the IRS launched several transfer pricing cases against Japanese MNEs in the US, including Epson, Fujitsu, Hitachi, NEC, Nissan, and Yamaha (Borkowski, 1997, 31). Therefore, we expect that, even though the transfer pricing penalty should have negatively affected all foreign MNEs with cross-border intrafirm trade, the penalty should have most strongly and negatively affected the stock market prices of Japanese MNEs with US affiliates because the §6662 legislation was targeted primarily at these MNEs.

Japanese MNEs with US affiliates over the 1990s are therefore selected as the appropriate sample for testing our hypotheses. We collected data on the ADRs of all the Japanese MNEs with US affiliates

over this period. The ADRs must have been listed on the NYSE and NASDAQ stock markets for a minimum of 255 days between 1989 and 1999. In all, 24 Japanese MNEs met these criteria and were included in our study. They are listed in Table 1.

Using Eventus version 6.2 and CRSP data, we employ event study methodology to test whether §6662 negatively affected the stock market returns of foreign MNEs with US subsidiaries, using the 10 underlined dates in our history section. We carefully checked our event windows and did not find evidence of confounding events.[11]

As outlined in McWilliams and Siegel (1997, 628), we compute the standardized abnormal returns, where the abnormal return is standardized by its standard deviation.[12] The standardized returns are then cumulated over 2-day (−1, 0) and 3-day (−1, +1) event windows[13] to derive measures of the cumulative abnormal return (CAR), as a percentage, for each firm.[14] Assuming markets are efficient, the event contains significant information that is unanticipated, and there are no confounding events, the test statistic Z provides a good test of whether the CARs are statistically significant.[15]

Another important issue raised by McWilliams and Siegel (1997, 635–636) is the presence of outliers, which are important in small samples typical of event studies. We compute two non-parametric tests to test for outliers: the ratio of positive to negative returns (PRNEG), and the binomial Z statistic, which tests whether PRNEG is statistically significant (McWilliams and Siegel, 1997, 634–635).

The next stage of our research design, following McWilliams and Siegel (1997), tests our hypotheses about the time-series and cross-sectional variation in abnormal returns using three *post hoc* analyses, two tests using multiple regression techniques and a third looking at the impact of the penalty on the Tokyo stock market. We employ additional regression diagnostics and bootstrapping methods as further tests for small sample bias and outliers. In the last stage of the research design, we conclude by estimating the cumulative wealth impact of the transfer pricing penalty, as discussed in McWilliams *et al.* (1999).

Empirical results

Event study results

Table 2 summarizes the impacts of §6662 on Japanese MNEs' abnormal returns for our selected event dates. The table reports CARs, as a percentage, for two windows (−1, 0) and (−1, +1), along with their Z scores, ratio of negative to positive returns, and binomial Z scores.

As the table shows, our event study results closely follow their predicted signs, with the impacts being negative and significant for almost all event dates. In addition, both the §6662 penalty regulations (13 January 1993, 2 February 1994) and their accompanying contemporaneous documentation requirements (2 February 1994, 8 July 1994) have significant, negative impacts on CARs. This provides empirical support for H1 (the penalty reduces MNE profitability) and H3 (documentation requirements reduce profitability). The policy impacts are also larger at the beginning of the period; as the surprise factor should deteriorate over time, one would expect the CARs to be smaller for later dates.

There are three anomalies where H1 is not confirmed by the empirical results. The Pickle hearings (10 July 1990) had no effect on CARs. Event study methodology depends on surprise: an event affects abnormal returns only if it is a surprise

Table 1 Japanese multinationals with ADRs and subsidiaries in the United States, 1990–1999

No.	PERMNO	TICKER	Company name
1	21152	CANNY	Canon Inc.
2	26060	CSKKY	CSK Corp.
3	28303	DAIEY	Dai Ei Inc.
4	37867	FUJIY	Fuji Photo Film
5	46085	IYCOY	ITO Yokado Ltd
6	46309	JAPNY	Japan Air Lines
7	47897	KNBWY	Kirin Brewery Ltd
8	51087	MKTAY	Makita Electric W
9	51131	SNE	Sony Corp.
10	53727	MC	Matsushita Electric
11	54579	MITSY	Mitsui & Co Ltd
12	55782	NIPNY	NEC Corp.
13	57681	NSANY	Nissan Motors
14	59344	KUB	Kubota Corp.
15	59424	PIO	Pioneer Electronic
16	59555	HMC	Honda Motor Ltd
17	61778	KYO	Kyocera Corp.
18	64231	HIT	Hitachi Limited
19	64362	TDK	TDK Corp.
20	68823	SANYY	Sanyo Electronic
21	75811	MBK	Mitsubishi Bank
22	76428	TKIOY	Tokyo Marine & Fire
23	76655	TOYOY	Toyota Motor Corp.
24	81331	WACLY	Wacoal Corp.

Table 2 Impact of §6662 on the abnormal returns of US ADRs by Japanese multinationals

Date	Event	Results		Window	Actual effect on CAR			
		Predicted by theory	Actual results (Z <5%)		CAR	Z	Pos:Neg	Binomial Z
20 Feb 1990	IRS audits foreign MNEs for tax underpayment.	−	−	(−1,0)	−2.87%	−6.22***	0:24	−4.40***
				(−1,+1)	−5.12%	−9.02***	0:24	−4.4.0***
10 Jul 1990	Pickle hearings on underpayment of US tax by foreign MNEs.	−	+	(−1,0)	0.57%	1.17	16:8	2.04*
				(−1,+1)	0.91%	1.48†	18:6	2.86**
4 Mar 1991	§6662 proposed penalty regulations issued (except for transfer pricing section).	−	−	(−1,0)	−4.96%	−7.47***	0:24	−4.57***
				(−1,+1)	−6.66%	−8.05***	0:24	−4.57***
13 Jan 1993	§6662 proposed transfer pricing penalty regulations. Documentation required for 'reasonable cause and good faith' exemption.	−	−	(−1,0)	−1.99%	−3.47***	2:22	−4.05***
				(−1,+1)	−1.76%	−2.59**	3:21	−3.64***
2 Feb 1994	§6662 temporary regulations outline penalty and documentation requirements.	−	−	(−1,0)	−0.19%	−0.30	10:14	−0.29
				(−1,+1)	−1.87%	−3.00**	6:18	−1.93*
17 Mar 1994	§6662 temporary regulations raise disclosure standard, impose cost burden.	−	0	(−1,0)	0.40%	0.71	12:12	0.56
				(−1,+1)	−0.35%	−0.67	9:15	−0.68
8 Jul 1994	§6662 temporary regulations provide documentation list, clarify requirements.	−	−	(−1,0)	−1.19%	−2.38**	5:19	−2.50**
				(−1,+1)	−0.57%	−0.78	9:15	−0.87
11 Mar 96	Transfer pricing penalty oversight committee created to coordinate penalties.	−	−	(−1,0)	−1.07%	−1.81*	6:18	−2.27*
				(−1,+1)	−1.06%	−1.40†	9:15	−1.05
17 Sep 1997	First §6662 transfer pricing penalty announced.	−	−	(−1,0)	−1.31%	−3.10***	7:17	−2.10*
				(−1,+1)	−0.45%	−1.03	10:14	−0.87
30 Dec 1998	40% transfer pricing penalty against DHL Corporation is sustained by US Tax Court.	−	0	(−1,0)	0.25%	0.38	15:9	1.46
				(−1,+1)	0.04%	−0.18	11:13	−0.18

Asterisks show significance levels using a two-tailed test, where †<0.10, *<0.05, **<0.01, ***<0.001.

to investors. Although the hearings were widely publicized, within the Japanese MNE community this would not have been 'new news', so the lack of market reaction is to be expected. The disclosure standard was raised on 17 March 1994, but this event was also either ignored or anticipated by the market. Lastly, the DHL penalty (30 December 1998), although widely reported in the financial press, was not reflected in CARs, presumably because there was no surprise factor attached to the penalty announcement.

We therefore conclude that the empirical evidence provides strong support for our hypotheses.

Subgroup analysis

We now turn to the second stage of our analysis. Following the research methodology laid out in McWilliams and Siegel (1997), we perform three *post hoc* tests to further explore the relationship between tax penalties and MNE profits.

The first test is a subgroup analysis of all the dates, separating our 24 Japanese MNEs into two groups: automotive and electronics (A&E, eight firms) and all other firms. The A&E group were heavily targeted during the 1990 Pickle hearings as the foreign firms most heavily engaged in transfer price manipulation and underpayment of US taxes.

Table 3 Subgroup analysis of abnormal returns

| | | | Actual effect on CAR | | | | | | | |
| | | | Autos & electronics group (n=8) | | | | All other Japanese MNEs (n=16) | | | |
Date	Event	Window	CAR	Z	Pos:Neg	Binomial Z	CAR	Z	Pos:Neg	Binomial Z
20 Feb 1990	IRS audits foreign MNEs	(−1,0)	−2.72%	−3.55***	0:8	−2.58**	−2.94%	−5.11***	0:16	−3.57***
	for tax underpayment	(−1,+1)	−5.02%	−5.43***	0:8	−2.58**	−5.16%	−7.21***	0:16	−3.57***
4 Mar 1991	§6662 proposed regulations	(−1,0)	−4.04%	−3.76***	0:8	−2.65**	−5.42%	−6.49***	0:16	−3.73***
		(−1,+1)	−5.31%	−3.96***	0:8	−2.65**	−7.34%	−7.06***	0:16	−3.73***
13 Jan 1993	§6662 proposed transfer	(−1,0)	−1.86%	−2.13*	0:8	−2.77**	−2.06%	−2.74**	2:14	−3.00**
	pricing regulations	(−1,+1)	−2.32%	−2.03*	1:7	−2.06*	−1.48%	−1.73*	2:14	−3.00**
2 Feb 1994	§6662 temporary regulations	(−1,0)	0.86%	0.78	5:3	0.89	−0.72%	−0.92	5:11	−0.99
		(−1,+1)	−1.16%	−1.23	4:4	0.18	−2.23%	−2.80**	2:14	−2.51**
8 Jul 1994	Document list	(−1,0)	−1.46%	−1.68*	1:7	−2.04*	−1.06%	−1.73*	4:12	−1.62†
		(−1, +1)	−1.03%	−0.98	3:5	−0.63	−0.34%	−0.27	6:10	−0.62
11 Mar 1996	Transfer pricing oversight	(−1,0)	−0.12%	−0.24	3:5	−0.63	−1.55%	−2.05*	3:13	−2.34**
	committee	(−1,+1)	−0.02%	−0.04	5:3	0.79	−1.58%	−1.69*	4:12	−1.84*
17 Sep 1997	First §6662 transfer pricing	(−1,0)	−0.39%	−0.65	3:5	−0.62	−1.77%	−3.34***	4:12	−2.13*
	penalty	(−1,+1)	0.27%	0.21	3:5	−0.62	−0.81%	−1.42†	7:9	−0.63

Asterisks show significance levels using a two-tailed test, where $^{\dagger}<0.10$, $*<0.05$, $**<0.01$, $***<0.001$.

Therefore, these firms were the most likely targets for §6662.

Table 3 reports CARs by subgroup for the seven significant event dates from Table 2. Although both groups show negative, significant Z, and binomial Z scores for most dates, two items are noteworthy. First, the negative CARs are larger for the non-A&E group. Second, the A&E CARs are significant only in the early years, whereas the non-A&E CARs are significant in all time periods. Paired means tests of the CARs for the two groups show significant differences between the two groups, using either a 2-day ($p<0.0328$) or 3-day ($p<0.0518$) window or a combined window ($p<0.0012$).

The most likely explanation for the differences between the two subgroups is the lack of policy surprise for the A&E firms. As the A&E group has been audited continuously since the late 1980s, and several A&E firms were in tax court by the mid-1990s, the penalty proposals would not have been a surprise for these firms. The group most surprised by §6662 should have been the non-A&E group, which accords with our event study results in Table 3, and our paired means comparison test. In practice, the actual penalties levied on the A&E

group might be higher, but event study methodology does not measure the actual income lost, only the impact on market valuations when investors are surprised.

Cross-section and panel data tests

Cross-section tests
Our second *post hoc* test examines the cross-sectional variation in CARs within our sample. H2 suggests that the penalty should have the most negative impact on MNE after-tax profits in cases where the probability of the penalty is high and the penalty is likely to be large. These two cases are most likely where the MNE has large intrafirm sales, is highly profitable before tax, pays little or no US taxes, and is a member of the A&E group.

Our dependent variable is *CAR3*, the 3-day cumulative abnormal returns. In the absence of firm-level data on intrafirm sales, we use the natural log of total sales, *LNSALE*, as a proxy for intrafirm sales. *LNSALE* also proxies for size of the MNE, which would accord with the hypothesis that large MNEs are more likely to attract attention from

the IRS. We expect a negative relationship between *LNSALE* and CARs.

PPM, the pre-tax profit margin, and the Berry ratio (*BERRY*) are used as measures of pre-tax profitability. The Berry ratio is a well-known profitability measure used by transfer pricing professionals and the IRS as possible evidence of transfer price manipulation; it is the ratio of sales minus cost of goods sold, divided by selling and general administrative expenses.[16]

TXASSET, the ratio of total US taxes paid divided by total assets, is used as a proxy for taxes paid. Low tax/asset ratios have been used by the IRS as evidence of transfer price manipulation (e.g. Heck, 1990; Eden, 1998). Low tax/asset ratios should trigger investigations by the IRS, raising the probability of the transfer pricing penalty. We therefore expect a positive relationship between *TXASSET* and CARs. Lastly, a dummy variable *A&E* is added for firms with primary SIC code in the automotive and electronics sectors.

Our model is therefore of the form

$$CAR3 = a_0 + a_1 LNSALE + a_2 PPM + a_3 BERRY$$
$$+ a_4 TXASSET + a_5 A\&E + \xi \qquad (2)$$

Table 4 reports our results for the cross-section tests, by event date. Data for the independent variables are taken from Compustat's ADR set for 1990–98. Where variables are missing, the firm is deleted from our data set: thus the number of firms varies for each of the regressions. In addition, a pooled time-series, cross-section test is conducted for the 19 firms with complete information for all years. All variables, including the dependent variable,[17] are centered at mean zero and the resulting variance inflation factors (VIFs) for all regressions are close to 1.0 so that multicollinearity is not a problem (except in the moderator analysis where high VIFs are inevitable). We use the REGRESS ROBUST technique in STATA/SE 8.0. This technique uses the Huber/White/sandwich estimator of variance in place of traditional OLS estimators: this generates 'consistent standard errors even if the data are weighted or the residuals are not identically distributed' (STATA, 2003, Vol 3, 328). Although we do have predictions for the direction of expected effects, we use a conservative two-tailed *t*-test.

The general fit of our model is very good, with all equations having significant *F* statistics. Looking first at the individual cross-section events, the most consistent result is firm size; *LNSALE* is negative and significant in three of the six dates, as hypothesized. The *A&E* variable is positive for all years, but significant on only one date (13 January 1993), contrary to our original expectations, but in accordance with our subgroup analysis. *BERRY* is negative and significant for two dates, but positive and significant for a third (13 January 1993);

Table 4 Cross-section time-series analysis of cumulative abnormal returns

	20 Feb 1990	4 Mar 1991	13 Jan 1993	2 Feb 1994	11 Mar 1996	17 Sep 1997	Pooled dates (1)	(2)	(3)
LNSALE	−0.0167†	−0.0002	−0.0165*	−0.0323†	−0.0038	0.0230	−0.0093†	−0.0089	−0.0086
A&E	0.0146	0.0186†	0.0025	0.0000	0.0157	0.0015	0.0107†	0.0114†	0.0113†
BERRY	0.0005	−0.0008**	0.0007†	0.0011	0.0007	−0.0026***	0.0001	−0.0067*	−0.0101**
PPM	0.0221	0.0776	−0.2766*	−0.0670	0.0389	0.3008	−0.0189	0.0301	0.0360
TXASSET	0.1973	0.4348*	1.0544**	−0.7751**	−0.3064	−0.9554†	0.0661	−0.4279	.−0.7150*
BERRY × TXASSET								−0.2733*	−0.4106**
PPM × TXASSET									3.3724†
YR90							−0.0474***	−0.0492***	−0.0498***
YR91							−0.0568***	−0.0585***	−0.0588***
YR93							0.0082	−0.0091	−0.0095
YR94							0.0107	−0.0136	−0.0152
YR96							0.0002	−0.0001	−0.0019
Constant	−0.0316***	−0.0414***	0.0111**	0.0061	0.0120*	0.0183*	0.0205***	0.0109	0.0027
Number of obs.	22	22	22	21	21	23	114	114	114
R^2	0.3321	0.5167	0.4871	0.2245	0.1645	0.3818	0.4267	0.4400	0.4517
F statistic	4.42*	65.53***	4.23*	14.72***	2.87†	9.41***	9.85***	9.13***	9.21***
F DIST								5.20*	6.26**

Asterisks show significance levels using a two-tailed test, where † < 0.10, * < 0.05, ** < 0.01, *** < 0.001.

interestingly, that is the only date where *PPM* is significant, suggesting that a moderator effect may be at work. *TXASSET* is significant in four of the six years; however, its sign switches (positive for two years, negative for two), so that no clear relationship emerges between CARs and the tax/asset ratio.

In addition, we ran a series of regression diagnostic tests (DFITS, Cook's Distance, WELSCH distance) to check for possible confounding effects from outliers (STATA, 2003, Vol 3, 373–377); none appeared. As the number of firms in our cross-section regressions is small ($N=22$ or 23), we also employed bootstrapping techniques (STATA, 2003, Vol 1, 112–127; Mooney and Dulal, 1993).[18] Setting the number of replications at 1000, we found that the bootstrap bias estimate relative to the observed standard error, for each independent variable in each regression, was always a small percent of the bootstrapped standard error, and that our observed standard error always lay within the bootstrapped confidence interval. We therefore concluded that the underlying distribution was approximately normal and our results were not affected by the small sample size.

Pooled cross-section time-series tests

In the pooled cross-section time-series regression, column 1 simply repeats the individual year regressions, with the addition of year dummy variables. Only two variables are significant: *LNSALE* (negative) and *A&E* (positive), which is consistent with our individual date results. In column 2 we add one moderator term, *BERRY* × *TXASSET*, to test our hypothesis that high profitability, coupled with low tax payments, is a better predictor of abnormal returns than either variable separately. Owing to the multicollinearity induced by adding the moderator term, the signs on the individual variables are somewhat suspect. However, it is interesting to note that both *BERRY* and the moderator variable *BERRY* × *TXASSET* are negative and significant, suggesting that MNEs with high profits and low taxes earned negative abnormal returns over the six-event period. The *F* DIST test is also significant ($F=5.20$), implying that there is a moderator effect at work. The *F* DIST test is even stronger in column 3 when we add *PPM* × *TXASSET* as a second moderator. *TXASSET* now becomes significant and negative, with a weakly positive moderator term. In all the three pooled regressions, the 1990 and 1991 year dummy variables are highly significant, suggesting that earlier event dates had more impact on abnormal

returns than later dates. This coincides with our expectations: because the surprise factor and the relative significance of the policy changes decline over time, we expect a greater impact earlier on.[19]

Looking across the nine regressions, some patterns are evident. Abnormal returns are negatively related to *LNASSET* and *BERRY*, as expected. CARs are also positively (not negatively) related to *A&E*, contrary to our original predictions but in accordance with our subgroup analysis. *TXASSET* is a significant predictor of CAR, but its sign varies; one reason may be that *TXASSET* moderates the relationship between the profitability ratios and abnormal returns. The two earliest event dates (20 February 1990 and 4 March 1991) are negatively and significantly related to abnormal returns, whereas later dates are not statistically significant. This accords with event study methodology whereby surprise is critical to the generation of abnormal returns.

We conclude that our *post hoc* analyses provide strong support for our hypotheses. Cumulative abnormal returns are affected by the size of the firm (−), membership in the A&E group (+), and pre-tax profitability (−). MNEs with high profits and low tax-asset ratios earned negative abnormal returns. The impact of the penalty on CARs was strongest at the beginning of the 1990s, and became less important as the element of surprise disappeared.

As final checks on our cross-section, time-series regressions, we ran regression diagnostic tests for outliers, without finding any problems. We also employed bootstrapping techniques (number of replications=1000) and concluded that our results were robust to sample size.

Market valuation of Japanese parents

As a third test, we examined the impact of US transfer pricing penalty announcements on the stock market returns of the Japanese parent firms, using daily stock prices on the Tokyo Stock Exchange.[20] While we expected the major impact of the US penalty to be on the abnormal returns of Japanese subsidiaries in the US (and therefore reflected in their US ADRs), there was some possibility, albeit remote, that US tax penalties could have negatively affected the market returns of Japanese parent firms on the Japanese stock market.

Using EVENTUS, external datasets were required to perform event studies with non-CRSP data. We retrieved the daily stock prices and market indices

for the Tokyo Stock Exchange from Datastream Advance 3.5 for the 23 firms in our sample.[21] Eq. (3) was employed to compute the market return for the stocks and the market.[22]

$$\text{Return}_t = (P_t - P_{t-1})/P_{t-1} \qquad (3)$$

where P_t is the adjusted closing price on day t when calculating the return for specific stock, P_t is *TOPIX* on day t when calculating the market return index, and *TOPIX* is the stock price index published by the Tokyo Stock Exchange.

We then designed an SAS 8.1 program to generate the necessary user stock files and request files from the whole dataset. These formatted files were required by EVENTUS when running with non-CRSP data.

In order to perform this *post hoc* analysis, we needed to change the event study in two ways. First, the event dates were adjusted one trading day

forward owing to the time difference between Japan and the US: for instance, 20 February 1990 is changed to 21 February 1990. Second, the event windows were expanded from 3- to 5-day: that is, from (−1, +1) to (−2, +2). The wider window was designed to offset the effects of information delays between the US and Japan.

Our results are summarized in Table 5, which reports the Z scores for two windows: (−1, +1) and (−2, +2). The sample firms show no significant responses to §6662, even with a broader observation window.

We therefore conclude that US transfer pricing penalties, even when aimed at Japanese MNEs, have their major impact on the valuation of Japanese ADRs on the US stock market and not on market returns in the home country. This may not be surprising, given that the parent's stock price on its home market should reflect the MNE's worldwide

Table 5 Abnormal returns of Japanese MNEs, Tokyo Stock Exchange

Date	§6662 Event	Results		Window
		Predicted	Actual (Z<5%)	
21 Feb 1990	IRS audits foreign MNEs for tax underpayment.	−	0	(−1, +1)
			−	(−2, +2)
11 Jul 1990	Pickle hearings on underpayment of US tax by foreign MNEs.	−	0	(−1, +1)
			0	(−2, +2)
5 Mar 1991	§6662 proposed penalty regulations issued (except for transfer pricing section).	−	+	(−1, +1)
			+	(−2, +2)
14 Jan 1993	§6662 proposed transfer pricing penalty regulations. Documentation required for 'reasonable cause and good faith' exemption.	−	0	(−1, +1)
			0	(−2, +2)
3 Feb 1994	§6662 temporary regulations outline penalty and documentation requirements.	−	0	(−1, +1)
			0	(−2, +2)
18 Mar 1994	§6662 temporary regulations raise disclosure standard, impose cost burden.	−	0	(−1, +1)
			0	(−2, +2)
11 Jul 1994	§6662 temporary regulations provide documentation list, clarify requirements.	−	0	(−1, +1)
			0	(−2, +2)
12 Mar 1996	Transfer pricing penalty oversight committee created to coordinate penalties.	−	0	(−1, +1)
			−	(−2, +2)
18 Sep 1997	First §6662 transfer pricing penalty announced.	−	0	(−1, +1)
			0	(−2, +2)
4 Jan 1999	40% transfer pricing penalty against DHL Corp. sustained by US Tax Court.	−	0	(−1, +1)
			0	(−2, +2)

activities, and not just a policy event in one host country, no matter how large.

Overall wealth impact on market value

Our empirical tests have shown that the transfer pricing penalty did negatively affect the market price of ADRs listed by Japanese multinationals with US affiliates in the 1990s. An important follow-up question is: by how much? That is, how large was the aggregate impact on market value of the transfer pricing penalty? This issue is discussed in McWilliams *et al.* (1999). They argue that the wealth impact is a useful measure of the overall significance of an event for shareholders, but document that wealth impact estimates can vary considerably across event studies depending on how the researchers define events, select event dates and windows, and control for confounding events and industry effects (McWilliams *et al.*, 1999, 360).

We estimated the aggregate impact of the transfer pricing penalty as follows. Let MV_{it} be the market valuation, in millions of dollars, of firm i's ADR at time t.[23] Let CAR_{it} be the cumulative 3-day-window abnormal return, as a percentage of the market value of firm i's ADR, at time t. For each of the six event dates in Table 4, we multiply MV_{it} by CAR_{it} to determine the dollar amount by which the market value of each firm's ADR changes on each event date t. We cumulate these dollar changes across these dates, for an estimate of the dollar impact on each firm between 1990 and 1997. We then cumulate these amounts across the 24 firms to estimate the total cumulative impact. Table 6 provides a summary of our results.

Table 6, first, reproduces the *CAR3* percentages from Tables 2 and 3 for all the MNEs and the two subgroups, by event date. We then show the total market value on the first event date, 20 February 1990 (US$402.892 billion) and the last event date, 17 July 1997 (US$446.69 billion). The next column shows our estimates of the drop in cumulative abnormal return, for all firms for all six dates. The decline was $56.12 billion, an average of $7 billion dollars per year, representing 12.56% of the end-period total market value. In other words, in the absence of the penalty legislation, the market value of the Japanese MNEs' ADRs would have been $56.12 billion, or 12.56% – on average – higher than it was at the end of the period. This represents the *unanticipated* decline in market value; the actual (anticipated plus unanticipated) decline may well have been even larger.

Table 6 Overall unanticipated impact of $6662 on market valuation, 1990–97

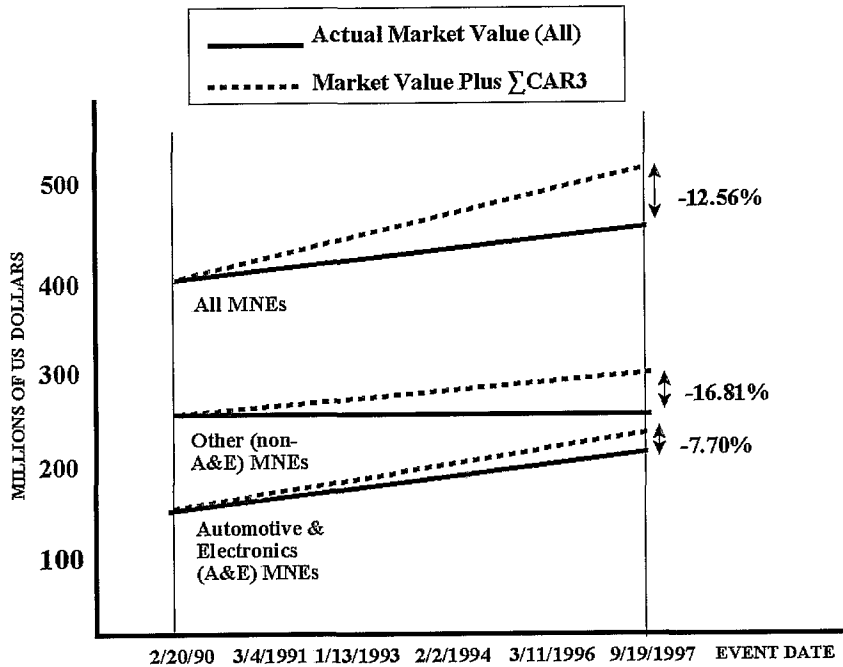| MNE type	No.	CAR3 (as a percentage)						ΣMV 20 Feb 90 (US$m)	ΣMV 17 Sep 97 (US$m)	ΣCAR3 20 Feb 90–17 Sep 97 (US$m)	ΣCAR3 20 Feb 90–17 Sep 97 / ΣMV 17 Sep 97 (%)
		20 Feb 1990	4 March 1991	13 Jan 1993	2 Feb 1994	11 Mar 1996	17 Sept 1997				
A&E	8	−5.02	−5.31	−2.32	−1.16	−0.02	0.27	157,852.1	208,279.7	−16,046.7	−7.70
Other	16	−5.16	−7.34	−1.48	−2.23	−1.58	−0.81	245,040.0	238,410.3	−40,069.8	−16.81
All	24	−5.12	−6.66	−1.76	−1.87	−1.06	−0.45	402,892.1	446,690.0	−56,116.6	−12.56

Figure 1 Cumulative impact of transfer pricing penalty on market valuation of Japanese ADRs, 1990–1999.

We then separated the 24 firms into the A&E group and all others, to see which subgroup was more affected by the transfer pricing penalty. As we discussed earlier, *CAR3* fell less for the A&E group than for the other Japanese MNEs in five out of the six event dates; we attribute this to the lack of surprise experienced by the automotive and electronics firms. Overall, we estimate that the cumulative market value for the A&E group fell by 7.7% compared with a drop of 16.81% for the non-A&E multinationals. Thus, the penalty regulations fell hardest on the firms that were least prepared.

We illustrate these points in Figure 1, which plots the cumulative market value in millions of US dollars for the first and last event periods for the 24 MNEs and the two subgroups. The solid lines show actual aggregate market value; the dotted lines show how much higher total market value would have been in the absence of the transfer pricing penalty (or, alternatively, had the penalty been totally anticipated). For the group as a whole, cumulative market value was 12.56% ($56.12 billion) lower than it would otherwise have been had the counterfactual (no penalty) occurred. Thus, the transfer pricing penalty was an effective 'big stick', causing a significant unanticipated drop in the market valuation of Japanese ADRs over the 1990s.

Discussion and conclusion

Governments are growing increasingly concerned about the declining taxes paid by MNEs. Tax penalties for transfer price misevaluations are designed to slow the erosion of the tax base by discouraging transfer price manipulation. For good reason, MNEs now see transfer pricing as the most significant international tax issue facing them today (Ernst & Young, 2003).

In this paper, we have argued that transfer pricing penalties should have a negative impact on the expected after-tax profits of foreign MNEs, for two reasons: first, if the penalty is levied, profits are automatically reduced by the nondeductible penalty, and, second, firms must incur substantial costs to contemporaneously document and justify their transfer pricing policies in order to avoid the penalty. The higher the probability of the penalty and/or the higher the penalty rate, the larger should be the negative impact on the firm's expected net income. We confirmed our hypotheses using event study methodology to examine the stock market reaction of ADRs issued by Japanese MNEs with US affiliates.

How realistic is our model in terms of our sample of Japanese MNEs with US subsidiaries? Given that Japan's statutory corporate income tax rate for many years has actually been higher than the US

rate, one might expect that Japanese MNEs should be shifting profits into, rather than out of, the US.[24] However, there is good evidence to support the argument that Japanese MNEs prefer to shift their profits to the home country. Munday and Peel (1997) report that Japanese subsidiaries engage in transfer price manipulation to minimize UK taxes even though the UK rate is lower. Laster and McCauley (1994) argue that, even if Japanese rates are higher than US rates, the ability of MNEs to shift profits to a third-country (tax haven) affiliate provides an incentive to shift profits out of the US. Buckley and Hughes (1998) argue that the reasons are partly cultural. Target costing techniques and the ethnocentricity of Japanese MNEs cause a preference for income shifting to 'Japan. Subsidiaries are treated as operational agents, which do not exist to make a profit themselves, but to support the parent company. As a result, the firms prefer to shift profits to Japan even though tax rates are higher. Borkowski (1997, 36), in a survey comparing transfer pricing practices of US and Japanese MNEs, finds that Japanese MNEs prefer negotiated transfer prices, and attributes this to a preference for group decision-making. Thus, Japanese MNEs should provide a conservative test case for our theoretical predictions. Given a bias toward shifting profits to Japan, the tax penalty should impose high costs on Japanese affiliates, whether they do comply (and therefore pay more US tax) or do not comply (and therefore are hit with the §6662 penalty).

Our study contributes to the international business literature in several ways. We provide the first theoretical analysis and empirical test of the impacts of the transfer pricing penalty on expected after-tax profits of MNEs. We show that not only the tax policy change but also the accompanying administrative compliance costs of documentation negatively affect firm profitability. We also show that even the threat of a penalty negatively affects market valuations. Our analysis provides additional evidence of the impact of tax policy changes on transfer pricing policies, and of event study methodology as a useful technique for evaluating policy changes. We have followed all the steps in good event study design laid out in MacKinlay (1997), McWilliams and Siegel (1997), and McWilliams *et al.* (1999), including developing a method to calculate the aggregate impact of a public policy change on all the firms in the sample. Moreover, this paper is one of only a few studies that analyze a public policy change and show how each step in

the policy process affects stock market prices. We have (with difficulty) tracked each stage of the process and looked at the impact on firm value. As time passes, the 'shock effect' goes away, and so the negative CARs shrink, which is also a nice result.

Our study could be directly extended in at least two ways: first, by analyzing the impacts of the tax penalty on all foreign MNEs in the US, and, second, by examining the impacts of penalty regulations in other OECD countries. Other government policies in the transfer pricing area, such as Advanced Pricing Arrangements, could also be analyzed using this approach. Moreover, our research methodology, which follows directly from McWilliams and Siegel (1997) and McWilliams *et al.* (1999), can be applied to any public policy process that unfolds over time and affects the market valuation of firms.

We conclude that the transfer pricing penalty is a 'big stick' (Culbertson, 1995), wielded by the US government in order to force foreign, and domestic, multinationals to comply with US tax law. With other governments now rapidly following the IRS lead, MNEs are caught in the middle, facing penalties at home and abroad as governments build 'ever-higher barricades of complex rules to retain what they see as their fair share of corporate profits' (The Economist, 2004, 72). Our study provides clear evidence of the effectiveness of this threat.

Notes
[1]We assume that the foreign tax authority makes a corresponding tax adjustment, which is typical under bilateral tax treaties, to avoid double taxation.

[2]In fact, the primary reason for levying penalties initially, according to the IRS, was the failure of large MNEs to provide any transfer pricing documentation. By 1999, most MNEs (with the exception of small firms) were providing documents. As a result, more recent penalties have been levied because of failure to use the proper transfer pricing method or not properly addressing intangibles and related-party services (Tax Management, 2000b).

[3]For other reviews of §6662, see Wickham (1991), Dolan and Bower (1994), Lowell et al. (1994), Magee et al. (1994), Culbertson (1995), Hannes et al. (1996), and Eden (1998).

[4]See, for example, the well-known US Treasury letter to Congressman Paul Kanjorski: '[T]he Administration has launched a vigorous enforcement program focusing. on transfer pricing. Before these changes were adopted, multinationals were able to set their transfer prices in any way they wished with little or no fear of penalty. Now taxpayers that fail to set their prices in accordance with the IRS guidelines, and that fail to document such compliance, will be subject to harsh penalties. [This should lead to] a marked change in taxpayer behavior in transfer pricing that will improve compliance in this very significant area of international taxation.' (quoted in Tax Notes, 1994).

[5]See also Wartzman (1993) and the US Department of the Treasury (1993).

[6]The January 1993 proposed regulations were strongly criticized by tax practitioners: Morrison (1993, 859), for example, argued that the penalty gave the IRS 'a potent weapon to encourage less aggressive reporting positions and to obtain more favorable negotiated results to the disputes that do develop.' Congress later responded (10 August 1993), as part of RRA '93, by making minor changes to the §6662 legislation to lower net adjustment penalty thresholds from $10 million to the lesser of $5 million or 10% of gross receipts for a substantial misvaluation, and from $20 million to the lesser of $20 million or 20% of gross receipts for a gross misvaluation. The standard for disclosure was also raised from 'not frivolous' to the higher 'reasonable basis'.

[7]On 31 August 1995, minor wording changes were made to accommodate GATT Uruguay Round commitments. Final §6662 regulations, issued on 8 February 1996, simplified the good faith and reasonable effort requirements (easing the burden of compliance for the taxpayer) and raised the net adjustment penalty floor from $5 to $10 million. On 1 December 1998, there was a minor amendment to 'reasonable basis'. Finally, on 22 January 2003, the IRS issued a directive to its field agents, requiring all large- and medium-sized MNEs to supply the IRS with the principal documentation required under the contemporaneous documentation regulations, and for those documents to go through a risk assessment by an IRS international examiner and/or international economist (Cole, 2003).

[8]DHL Corporation and Subsidiaries, Petitioners v. Commissioner of Internal Revenue, Respondent. US Tax Court, 30 December 1998.

[9]DHL appealed the case in November 1999, raising the total amount involved in transfer pricing disputes in US federal tax courts to four billion dollars (Tax Management, 2000a). While no information is publicly available with respect to the total dollar amount of transfer pricing penalties levied so far, the IRS's Transfer Pricing Oversight Committee has confirmed that penalties were applied in 72 tax years (Tax Management, 2000b).

[10]For a contrary view, see Eden (1998, Chapter 7).

[11]Event study methodology requires that, within the window dates, the researchers check to see whether there have been any confounding events for the firms in the study, and drop dates where there are confounding events (McWilliams and Siegel, 1997, 634). We carefully checked all the dates mentioned in our historical review, and eliminated any dates where possibly confounding events, at either a macro level (e.g., general policy announcements, macroeconomic shocks) or a micro level (firm-specific announcements), occurred. For example, dates where US budget announcements that affected all firms were made (e.g., 3 October 1990, 5 November 1990, and 10 August 1993) were dropped from the analysis. Dates with minor wording changes to the legislation were also dropped. We also checked for the presence of micro-level confounding events, for each of our Japanese MNEs, over a 3-day window around the remaining event dates, but did not discover any firm-specific events that would have materially affected the stock market price. Regulatory changes that happened outside our window dates were ignored.

[12]EVENTUS model #3: Market Model, Standardized Residual Method, Equally Weighted Index.

[13]McWilliams and Siegel (1997, 636) recommend short windows because a long event window reduces the power of the Z test, generating false inferences about statistical validity.

[14]As policy changes may not be immediately known by all participants, we argue that a longer 3-day window may be more appropriate than a 2-day window. However, as researchers use different windows, we report both.

[15]Based on the average standardized CARs across n firms over the event window (Tax Notes, 1994).

[16]$PPM = $ (Sales $-$ COGS $-$ SG&A $-$ Other Expenses $-$ Depreciation)/Sales: that is, PPM is the margin prior to the calculation of the income tax. BERRY=(Sales$-$COGS)/SG&A, so BERRY is an 'earlier' (above the line) measure of pre-tax profitability than PPM. They are not closely related; the Pearson correlation (n=114) is -0.1264 and not significant.

[17]The Atkinson test in STATA/SE 8.0 was significant, implying that the transformation was necessary.

[18]Bootstrapping is a nonparametric method that estimates standard errors without making any assumptions about the underlying distribution of the model. The technique takes a random sample from the data and repeats the sampling, with replacement, multiple times, to obtain bootstrap estimates of the underlying distribution. STATA calculates four estimates (normal, percentile, bias-corrected, and bias-corrected and accelerated) of the bootstrapped standard error, the bias relative to the observed standard error, and the 95% confidence interval. When the bias is small relative to the bootstrapped standard error, and the observed standard error lies within the 95% bootstrapped confidence interval, we can conclude that our estimates are robust.

[19]Another possibility is that some of these firms may have later concluded Advanced Pricing Agreements (APAs) with the IRS, thus reducing the probability of the penalty.

[20]Another *post hoc* analysis was dropped owing to data unavailability. We intended to conduct an event study of stock market reactions by Japanese MNEs that did not have subsidiaries in the US. We expected these firms to experience little or no change in market value as they would not directly face potential taxation by the IRS. However, there were too few firms to conduct the analysis.

[21]Tokio Marine and Fire Insurance Co. Ltd was dropped from the original sample. It was restructured into Millea Holdings, and insufficient information was available.

[22]One limitation of the current *post hoc* analysis is the calculation of market return. Owing to the constrained data access and EVENTUS's special requirements, we had to use a market-return proxy by computing the changing ratio of the adjusted closing prices.

[23]Market value, on Datastream, is the share price multiplied by the number of ordinary shares in issue, measured in millions of dollars.

[24]Borkowski (1997, 30) states that, in 1994, the Japanese corporate income tax rate was 37.5% plus a 12% enterprise tax, compared with a US federal tax rate of 35%.

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