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DIVIDENDS AND PROFITS: SOME UNSUBTLE FOREIGN INFLUENCES

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ABSTRACT

American corporations earn a large and growing share of their profits from their foreign operations. This paper evaluates the effect of foreign earnings on dividend payments by American corporations. The results suggest that the effect may be rather dramatic: that, all other things equal, U.S. corporations pay dividends out of foreign earnings at rates that are three times higher than their payout rates from domestic earnings. Why firms do so is unclear, though this behavior may be consistent with a signalling view of dividends. There is a curious tax consequence of this high payout rate on foreign earnings: the tax system, which grants foreign tax credits to U.S. corporations for the foreign taxes they pay, may receive more revenue from taxing the dividends of U.S. shareholders than from the corporate tax on foreign earnings.

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1. Introduction.

Two of the conspicuous facts about American corporate finance in the 1980s are that US corporations paid dividends at very high rates out of their after-tax profits, and that a very high fraction of those profits came from foreign (non-US) sources. These events could be related, if for some reason foreign earnings stimulate larger than average dividend payouts. This paper explores the connection between dividends and foreign profits. Based on cross-sectional and time series evidence, it appears that US corporations pay dividends out of their foreign earnings at about three times the rate that they do out of their domestic earnings.

There are two reasons why it is useful to identify separately the effects of foreign and domestic earnings on dividend payouts. The first is that the impact of foreign earnings may illuminate more general features of corporate dividend policy. Of course, it is not always easy to identify the linkage between particular sources of income and the dividends that firms pay. This difficulty is greatly increased by the absence of a compelling theoretical explanation of why firms pay dividends in the first place.

One popular view of corporate dividend policy is that firms pay dividends at least in part to signal their profitability. If one accepts the hypothesis that foreign earnings are particularly difficult for investors to verify, then the signalling view of dividends could imply that foreign earnings would stimulate greater dividend payouts than would an equal amount of domestic earnings.

The second reason to examine the effect of foreign earnings is that dividend behavior can have an important effect on the amount of US tax revenue generated by the foreign earnings of US corporations. The foreign tax credit

mechanism prevents the US government from collecting extensive tax revenues on the foreign earnings of American companies, since US firms receive credits for the taxes their foreign affiliates pay to foreign governments. But corporate income is taxed twice, first at the corporate level and second at the personal level when US shareholders receive dividends. By stimulating additional dividends, the foreign earnings of US corporations may generate more tax revenue through the personal income tax than the same earnings do via the corporate income tax.

Section 2 of the paper traces the recent growth of foreign profits of US corporations, and reviews the relevant tax treatment of foreign income. Section 3 considers the implications of previous theoretical and empirical work on corporate dividend policy for the connection between dividend payouts and foreign earnings. Section 4 examines the dividend behavior of a panel of US firms in the 1980s, and section 5 considers dividend patterns for the aggregate US corporate sector from 1950-1986; in both cases foreign earnings are found to stimulate dividends at a higher rate than do domestic earnings. Section 6 concludes with tax revenue and other implications of dividend behavior induced by foreign profitability.

2. The Growth of Foreign Earnings.

American companies have always done most of their business and earned most of their profits in the United States. Since 1972, however, there has been dramatic growth in the fraction of after-tax US corporate income arising from foreign sources. Figure 1 plots the time pattern of three different measures of the ratio of US corporations' after-tax foreign earnings to their after-tax domestic earnings. All three tell a similar story: by the 1980s

foreign profits represented an important source of profitability for US corporations. The smallest of these measures, one that subtracts from current foreign earnings the future US tax liability they produce, indicates that in 1971 foreign after-tax profits of US corporations were equal to 16.8% of their domestic after-tax profits. By 1986 the same ratio was 39.0%.

In order to interpret the loci in figure 1 it is necessary to make some adjustment for the relative values of foreign and domestic after-tax earnings. The foreign earnings of American corporations are subject to the US corporate income tax just as their domestic earnings are. Since the foreign earnings are also subject to taxation by foreign governments, US tax law provides a foreign tax credit for income taxes (and related taxes) paid to foreign governments in order not to subject American multinationals to double taxation. With the foreign tax credit, a US corporation that earns $100 in a foreign country with a 15% tax rate (and a foreign tax obligation of $15) pays only $19 to the US government, since its US corporate tax liability of $34 (34% of $100) is reduced to $19 by the foreign tax credit of $15. The foreign tax credit is subject to a number of restrictions, including a limit equal to US tax liability on foreign income: if, for example, the foreign tax rate were 52%, then the firm pays $52 to the foreign government but its US foreign tax credit is limited to $34.[1]

Deferral of US taxation of certain foreign earnings is another important feature of the US international tax system. A US parent firm is taxed on its

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[1]Furthermore, income is broken into different functional "baskets" in the calculation of applicable credits and limits. In order to qualify for the foreign tax credit, firms must own at least 10% of a foreign affiliate and only those taxes that qualify as income taxes are creditable. For a further discussion of these issues, see Hines (1990), from which some of the material in this section is derived.

subsidiaries' foreign income only when returned to the parent corporation, and receives foreign tax credits for foreign income taxes paid (by the subsidiaries) on income subsequently received by the parent as dividends from the subsidiary. This type of deferral is available only to foreign operations that are separately incorporated in foreign countries ("subsidiaries") and not to consolidated ("branch") operations. The US government taxes branch profits as they are earned, just as it would profits earned within the United States. Hence, choosing to organize a foreign operation as a branch means that the parent US firm forgoes the opportunity of deferring US taxes on foreign income.[2]

The deferral of US taxation may create incentives for firms to delay repatriating dividends from their foreign subsidiaries. Their ability to do so is limited by a number of provisions in the Internal Revenue Code, notably the Subpart F rules that treat passive returns on reinvested foreign earnings as if distributed (and hence taxable) to American parent firms. The practice of US multinationals in aggregate has been to repatriate about half of their annual foreign after-tax earnings.[3]

In order to compare the foreign earnings of US firms to their domestic earnings it is necessary to adjust foreign earnings for the US tax due upon

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[2]On the other hand, organizing as a branch permits the investor to deduct foreign branch losses from the firm's US income, and may (in some cases) reduce the burden of foreign regulations. American petroleum firms typically organize their foreign affiliates as branches, since very high rates of foreign taxation makes deferral of US tax unimportant, and they can thereby exploit the losses that are often incurred in the early years of drilling.

[3]Though it appears to be a carefully selected half, with particularly attractive tax characteristics. See Hines and Hubbard (1990).

repatriation. Figure 1 presents three variants of this calculation.[4] The locus connecting square boxes (□) represents the highest of these ratios: it uses a definition of after-tax foreign earnings as foreign earnings minus foreign taxes paid. In the locus connecting pluses (+), the concept of after-tax foreign income is one that subtracts from foreign earnings current foreign taxes and current US taxes on foreign-source income. And the locus connecting diamonds (◇) represents the ratio in which after-tax foreign income is measured by foreign income, minus current foreign taxes, minus current domestic taxes on foreign-source income, minus estimated future domestic taxes on unrepatriated current foreign-source income.

All three loci reveal significant growth in the relative importance of foreign earnings in the 1970s and 1980s. There are, no doubt, several factors

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[4]The ratios in Figure 1 were constructed from data obtained from the Bureau of Economic Analysis of the US Commerce Department on the after-foreign-tax foreign earnings of US corporations; the same source indicates how much of the foreign earnings were reinvested abroad. Current US tax obligations on this income were calculated by assuming that firms faced the statutory US corporate tax rate on their repatriated foreign earnings (including Subpart F income and unrepatriated branch earnings), and that they received the aggregate foreign tax credit reported in US Internal Revenue Service (various). The data do not, of course, indicate the foreign tax rate on reinvested subsidiary earnings. That tax rate was estimated by calculating the average tax rate on *repatriated* subsidiary earnings by comparing repatriations to the reported aggregate dividend gross-up for years after 1962. (For years before 1962 the tax rate was estimated based on the ratio of the foreign tax credit to total taxable income; this includes branches with subsidiaries, but is unavoidable. For years after 1982 BEA does not report reinvested subsidiary profits separately from reinvested branch profits; reinvested subsidiary profits were estimated somewhat on the high side by taking branch reinvestments to be zero.) The assumption underlying these figures is that the reinvested income faced the same tax rate as the repatriated income. Theory and evidence from US multinationals (Hines and Hubbard, 1990) suggests that this procedure might understate the residual US tax liability on foreign income, since firms are likely to repatriate first their heavily taxed foreign income. On the other hand, some of this foreign income is earned by US multinationals with domestic losses that are effectively untaxed by the US on their foreign income, so there is no clear direction of bias in the aggregate numbers.

responsible for this change: the depreciation of the US dollar against major foreign currencies, which has the effect of reducing the value of domestic earnings against dollar-denominated foreign earnings; the rise in foreign profits of US oil companies following the OPEC price increases of the 1970s;[5] and the accumulation of US-owned capital in foreign countries and (possibly) its rising productivity.

Whatever its source, the recent importance of foreign earnings coincides with dividend payments by US corporations at rates that are very high by historic standards. Figure 2 plots the ratio of common dividends paid by US corporations to the sum of their after-tax foreign and after-tax domestic earnings, in which the least generous measure of after-tax foreign earnings (o) is used. The aggregate dividend payout ratio does not exhibit quite the same secular trend as do the ratios of foreign to domestic income, but since 1980 the payout ratio has exceeded its previous highest level in the postwar period.[6] Why the payout ratio might take such a shape, indeed why firms pay dividends at all, is the subject of the next section.

3. Dividends, Profits, and the Dividend Puzzle.

Since the work of Miller and Modigliani (1961), it has been clear that in the absence of tax considerations or informational asymmetries the payout

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[5]Oil companies do not appear to be solely responsible for the trend displayed in Figure 1. The pattern looks the same when the earnings of foreign branches are removed from the calculation; this suggests that the growth in foreign earnings has diversified sources, since oil firms usually organize their foreign affiliates as branches.

[6]Note that the ratio plotted in Figure 2 is based on dividends and not on total cash distributions by corporations. The 1980s also saw a dramatic rise in the level of share buybacks and share redemptions through acquisitions, as Shoven (1987) and Bagwell and Shoven (1989) document.

behavior of firms should not affect their valuation by investors. Hence the hypothesis that financial policy is chosen to maximize shareholder welfare carries no implications for dividend behavior. This conclusion is subject to two serious qualifications, however, since the Internal Revenue Code treats dividends quite differently than unrealized capital gains on corporate stock, and managers may have valuable information that shareholders lack.

The tax cost of dividend payouts arises from the preferential tax treatment of capital gains relative to dividend receipts. Individual shareholders generally pay personal income tax on the dividends they receive, while if the firms they own do not pay dividends, but instead reinvest their earnings, shares will rise in value to reflect the greater capitalization of the firm and shareholders can take their returns in capital gains. Taxes on capital gains can be deferred until realization, avoided entirely if assets are held until death, and for long periods of time were subject to taxation at rates signficantly lower than tax rates on ordinary (including dividend) income.[7]

The taxation of dividends need not influence dividend payout behavior under two circumstances. The first, identified by Miller and Scholes (1978, 1982), is that dividends are effectively untaxed, either because tax-exempt entities hold shares of dividend-paying firms, or because dividend income raises the (binding) limit on interest expense deductions. While there is

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[7]As a result, the accrual-equivalent capital gains tax rate has generally been significantly lower than the tax rate shareholders pay on dividends. See Poterba (1987a), who finds that the most important tax advantages of capital gain income come from deferral and nonreporting. Corporate shareholders, which constitute a small part of the shareholding population in the US, received an 85% exclusion on dividends received until passage of the 1986 Tax Reform Act (the exclusion is currently 70%), so may have preferred dividends to capital gains.

some evidence of this behavior, it does not appear to explain the presence of so many dividends in the economy.[8] The second case is that in which firms are unable to distribute their profits to shareholders in any way other than by paying dividends. Under this view of the dividend process, analyzed by King (1977), Auerbach (1979), and Bradford (1981), dividends represent the residual disposition of funds after profitable investment opportunities are exhausted, so the rate of dividend tax (if constant over time) should not affect the dividend decision. This description of corporate behavior rules out nondividend methods of transmitting profits to shareholders, of the type that appear to be growing in importance recently.[9]

A number of reasons have been advanced to explain why shareholders might prefer the firms they own to pay dividends in spite of the irrelevance relationship identified by Miller and Modigliani and in spite of possible tax costs. One possibility, suggested by Easterbrook (1984), is that shareholder insistence on regular dividend payments may reduce the financial discretion of management and thereby avoid some of the agency problems identified by Jensen

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[8]The best evidence is the significant magnitude of personal tax collections from dividend income. See Feenberg (1981) on the (limited) empirical significance of the interest deduction limit explanation of dividend taxation. The Miller and Scholes view of dividends relies on equal taxation of dividends and capital gains; since capital gains taxes are routinely avoided, this generally requires that dividends be untaxed. Alternatively, if marginal investors are traders who do not exploit deferral of capital gains and who fail to hold their gains to take advantage of long-term treatment, then they may face the same rate of (positive) tax on both dividends and capital gains. Evidence on this issue from ex-dividend day price and volume movements is mixed: Gordon and Bradford (1980) and Miller and Scholes (1982) find little effect of dividend taxes on share prices, and Richardson et al. (1986) finds little effect on trading volume, while Elton and Gruber (1970), Litzenberger and Ramaswamy (1979), Kalay (1982a), Poterba and Summers (1984, 1985), and Barclay (1987) find a significant price effect.

[9]See, for example, the evidence on share repurchases presented in Shoven (1987) and Bagwell and Shoven (1989).

and Meckling (1976).[10] Another possibility, associated with Shefrin and Statman (1984), is that regular dividend payouts are beneficial to individual shareholders whose behavior is occasionally irrational. A third possibility is that dividends, which for corporate shareholders are tax-favored over retentions, may attract corporate investors who perform valuable monitoring functions (as in Shleifer and Vishny, 1986).[11]

The fourth possibility is that by paying dividends a firm signals its profitability to shareholders and potential shareholders. This view of dividends, explored in Ross (1977), Bhattacharya (1979), Hakansson (1982), and Miller and Rock (1985), emphasizes that managers of successful firms have incentives to indicate in a credible fashion that their companies are more profitable than are other firms that are observationally identical. Dividends may provide such a signal. Certainly, firms without profits will find it difficult to pay dividends; the tax cost of dividends may, however, be greater than necessary to signal earnings, so there remains healthy skepticism about the signalling explanation of dividend behavior.[12] One of the questions that signalling interpretations must address is why dividend payments offer more

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[10]Two empirical studies find evidence consistent with this view. Lang and Litzenberger (1989) find that the market reacts favorably to dividend announcements by firms that would otherwise "overinvest" their funds. Barclay and Smith (1988) argue that in the presence of asymmetric information dividends are to be preferred to share repurchases, since opportunistic managers can better exploit the latter. They find that share repurchase announcements widen bid-ask spreads, which is implied by their model.

[11]Bagwell and Judd (1989) consider a related explanation of dividends based on *individual* investor heterogeneity that stems from transactions costs.

[12]See, for example, Black (1976) and Crockett and Friend (1988).

efficient signals than the tax-favored alternative of share repurchases.[13] Assuming that they do, then certain types of earnings may require more in the way of dividend signals than do other earnings. If, for example, foreign earnings are more difficult for investors to verify than are domestic earnings, then foreign earnings might trigger more dividend payments than would an equal amount of domestic earnings.

The empirical work on corporate dividend policy has been significantly influenced by Lintner's (1953, 1956) model of dividends as the outcome of a partial adjustment process. Based on his interviews with corporate executives, Lintner hypothesized that firms adjust dividends to "desired" levels that are determined by current profits. He specified a model of the form:

$$\Delta D_{it} = a_i + c_i(D^*_{it} - D_{it-1}) + u_{it} \qquad (1)$$

in which Δ is the first-difference operator ($\Delta x_t = x_t - x_{t-1}$), D^*_{it} is firm i's "desired" level of dividends based on year t earnings, D_{it-1} is the firm's dividend in year t-1, a_i and c_i are firm-specific constants, and u_{it} an error term. Lintner specified D* as a linear function of current earnings, $D^*_{it} = r_i E_{it}$, in which r_i is a firm-specific payout rate, and estimated (1) on annual data for the United States. The equation fit quite well, appeared to be robust to definitional changes in the variables, and accurately predicted

[13]This question is addressed by John and Williams (1985), Ambarish, John and Williams (1987), Ofer and Thakor (1987), Williams (1988), and Bernheim (1990). The signalling equilibria they analyze have the feature that shareholders of profitable firms prefer to incur the tax cost of dividends rather than have their shares repurchased at prices below their true value (which is known to managers and not known to shareholders).

postwar payout behavior based on parameters estimated from prewar data.

Lintner's model is the foundation of a number of subsequent empirical studies that generally confirm his findings. Brittain (1964, 1966) experiments with a number of different profit measures on the right side of (1) in both aggregate and firm-level time series regressions, finding that the model fits reasonably well when estimated on after-tax corporate profits as conventionally measured. Fama and Babiak (1968) regress variants of (1) on postwar firm-level data from Compustat, paying special attention to the value of a_i, the time series properties of the residuals, and possible alternative lag specifications of E and D. They, too, find that Lintner's model works rather well, though they express a mild preference for omitting the constant term a_i and for including lagged profits E_{it-1} on the right side.

There is a second line of research, in part pursued by Fama and Babiak, that views the dividend process as designed to convey information about future firm earnings. Pettit (1972), Watts (1973), Ang (1975), and Laub (1976) find some mild support for this interpretation, though their results suggest that explicit treatment of information does not add significantly to the explanatory power of a Lintner-type model. As Lee et al. (1987) note, there is only a rather small statistical distinction between firm-level models of dividends based on partial adjustment and those based on informational content. They propose and estimate a somewhat more general version of (1):

$$\Delta D_{it} = a_{i1} + a_{i2}D_{it-1} + a_{i3}D_{it-2} + a_{i4}E_{it} + v_{it} \qquad (2)$$

in which it is possible to impose and test various constraints on parameters

and time-series properties of the residuals, v_{it}.[14] Using firm-level quarterly data, they find significant a_{i3} coefficients and autocorrelation of the v's, which are consistent with a model that incorporates both the features of Lintner's model and an information transmission by dividends.

One of the issues left hanging in this research is the possible role of tax considerations in influencing the level of D^*_{it}, and thereby the level of annual dividends. A separate line of research by Feldstein (1970, 1972), King (1971, 1972, 1977), and Poterba and Summers (1985) addresses this question by estimating dividend payout models on aggregate quarterly British time series, with the tax cost of dividends relative to capital gains as a right-side variable. They specify adjustment processes of the Lintner type, with the log of aggregate dividends on the left side and log earnings on the right. In almost all of their specifications the tax cost of paying dividends appears to affect D* and D. Poterba (1987b) finds similar results for annual aggregate US data. It should be noted, however, that other studies that do not include the tax cost of paying dividends also find reasonably good fits for aggregate annual US data.[15]

4. Foreign Earnings and Domestic Dividends: Cross Sectional Evidence.

The most direct way in which to test the effect of foreign and domestic earnings on dividend payouts is to estimate a model of the dividend process in

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[14]The idea is that, under an information-content model of dividends, the desired dividends in (1) might equal $D^* = rE^*$, in which E^* represents a permanent notion of earnings determined by the process $E^* = \delta E_t + (1-\delta)E_{t-1}$. Combining these with (1) yields (2) as an estimating equation, with the implied restrictions (see Lee et al., 1987) that $a_2 = (1-\lambda-\delta)$, $a_3 = (1-\lambda)(1-\delta)$, $a_4 = r\lambda\delta$, and $v_t = u_t-(1-\delta)u_{t-1}$, in which the Lintner model implies $\delta=1$ and the information-content model implies $\lambda=1$.

[15]See, for example, Auerbach (1982) and Marsh and Merton (1987).

which domestic and foreign earnings enter separately. This section examines firm-level evidence on the effect of various earnings sources. By necessity these data are limited in coverage to the period 1984-1989. In section 5 the analysis is extended to aggregate time series on earnings and dividends. Both the cross-sectional and time series estimates suggest that foreign earnings exert strong positive influences on dividend payouts, though this inference is subject to a number of qualifications.

The Data

The analysis in this section uses a panel of firm-level data reported in Compustat over the period 1984-1989. As a special project initiated in 1984, Compustat culls from a subset of its firms information on their foreign pretax earnings and foreign income taxes paid. Firms are not required to report the countries in which they earned their profits; nor are they required to indicate if profits were repatriated or reinvested abroad. In a sample of 2800 firms, foreign earnings and tax data are available for approximately 500 firms for each of the reporting years. The 326 firms reporting foreign and domestic earnings continuously over the whole sample period were roughly twice the size of average firms in Compustat, with US federal tax liabilities in 1984 averaging $48.6 million (v. $26.0 million for the Compustat average), and 1989 tax payments of $72.3 million (v. the average liability of $30.4 million).

The Evidence

There is no consensus model of dividend payout behavior. In its absence, this section fits the data to some alternative models that include foreign

earnings as exogenous variables. A general specification that distinguishes the effect of foreign and domestic earnings is:

$$D_{it} = (\alpha_t + E_{it} + \eta F_{it})\psi_t + \epsilon_{it} \qquad (3)$$

in which D_{it} is firm i's common dividend payout in year t, E_{it} its domestic after-tax earnings, F_{it} its foreign after-tax earnings, η a parameter common to all firms (and common to all time periods), and α_t and ψ_t year-specific parameters common to all firms. The parameter η reflects the impact of foreign earnings relative to domestic earnings; if $\eta = 1$ then both influence dividends equally, while if $\eta > 1$ then foreign earnings stimulate greater dividends than do domestic earnings. In the form of equation (3), η can be estimated by comparing the coefficients on domestic and foreign earnings in a simple linear regression with dividends on the left side. The linearity of the terms on the right side of (3) is a particularly attractive feature in the present context, since an attempt will be made to link the firm-level results in this section to aggregate estimates in section 5. An advantage of linear specifications is that they permit aggregation, so most of the estimates to follow will rely on linear models.[16]

Table 1 presents cross-sectional estimates of (3) for 1984. In the

[16]There are two difficulties with the specification (3). One is that it ignores that dividends are constrained to be nonnegative. The second is that it treats the firms reporting foreign earnings as a random sample. It is hard to know which of these two presents the bigger problem, and whether either is significant in practice. The first could be treated by the usual truncation methods, but to do so immediately raises questions of whether share issues should be treated as negative dividends, how to interpret debt retirements, and so on. The second may present a problem, at least in the cross sections, but the direction of bias is not clear. The most straightforward practice is simply to estimate (3) and interpret the results with caution.

simple linear specification presented in column one the coefficient on domestic after-tax earnings is .31, while the coefficient on foreign after-tax earnings is .41, estimated with standard errors large enough to make the difference insignificant. A comparison of columns one and two indicates that the constant term is unimportant to the regression, and in particular is unimportant to the difference between the effect of foreign earnings and the effect of domestic earnings.

As the discussion in section 2 indicates, the appropriate notion of "after-tax" foreign earnings is sometimes problematic for US multinationals that earn profits in low-tax foreign jurisdictions from which repatriated earnings would generate US tax liability. Because firms are not required to indicate on their annual reports and 10-Ks the countries in which their foreign earnings are located, and firms are not required to divulge their excess foreign tax credit carryforward and carryback status, it is not possible for the analyst to identify precisely the potential future tax liabilities associated with particular foreign earnings. It is, however, possible to estimate the potential US tax cost of foreign earnings based on the firm's average foreign tax rate from the reported financial data.

Column 3 of Table 1 reports the result of re-running equation (3) on 1984 data in which the US tax due on repatriating foreign earnings is added as an explanatory variable.[17] This change makes little difference to the

[17]Tax due upon repatriation is taken to equal the maximum of zero and foreign pretax earnings times the difference between the (current) statutory US tax rate and the effective foreign tax rate, defined as reported foreign taxes divided by reported foreign pretax earnings. This calculation ignores the fact that some American parent firms have domestic losses and do not pay US tax on their foreign earnings; for purposes of the calculation the value of deferral is zero, and the ability of US firms to time their repatriations to average high- and low-tax foreign earnings for purposes of the foreign tax credit limitation is ignored. Furthermore, the calculation ignores the fact

coefficient on domestic earnings (still 0.31), and only a small difference to the coefficient on foreign earnings (now 0.44), while the residual tax liability has an estimated coefficient of -0.75 (with a large standard error that makes it insignificant). This appears to be a rather large coefficient, especially given the voluntary nature of the dividend repatriation decision, but it is not possible to reject the hypothesis that the coefficients on foreign income and US residual tax liability have equal magnitude and are of opposite signs. The specification in column 4 imposes that restriction directly, with results that are similar to the other specifications.

It is possible that the apparent value of $\eta > 1$ is the consequence of some nonlinearity in the true dividend payout function. As a test of the robustness of the results from the linear specification, columns 5 and 6 of Table 1 present estimates of nonlinear (quadratic) payout models. Suppose that (3) were modified to:

$$D_{it} = \psi_{1t}(E_{it} + \eta F^*_{it}) + \psi_{2t}(E_{it} + \eta F^*_{it})^2 + \epsilon_{it} \qquad (4)$$

in which F^*_{it} represents foreign after-tax profits adjusted for the associated residual US tax liability. There are two forms in which (4) can be estimated. One consists of breaking the right side into five separate components that can be estimated in an OLS regression; those estimates are presented in column 5. In column 5 there is a significant difference between the coefficients on foreign and domestic income: the coefficient on (linear) domestic profits is

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that some of the reported current US federal income tax paid by the firm represents payment of US tax due on repatriated profits. Hence the residual US tax liability as calculated probably represents an upper bound on the true figure.

0.21, while the estimated coefficient on (linear) foreign income is 0.63. Column 6 presents nonlinear least squares estimates of the same relationship, imposing the restrictions implied by (4). The estimated equation exhibits some quadratic curvature (ψ_2 is negative and significant), while the estimated value of η is 1.91 and significantly greater than 1.

Tables 2-6 report the results of repeating the estimating procedures for cross sections in 1985, 1986, 1987, 1988, and 1989. Magnitudes differ, but the qualitative result that foreign income has a stronger impact on payout behavior appears in every cross-section. Estimates of η from the nonlinear regressions range from a low value of 1.91 in 1984 to 6.59 in 1987; it is always significantly different from 1. While this result that $\eta > 1$ is present on a consistent basis, the value of η implied by the regression coefficients does not appear to be constant.

Estimates of (3) and (4) must be interpreted with some degree of caution. It is possible that the cross-sectional estimates may pick up correlations of foreign earnings with payout levels that simply represent correlations with omitted variables. For example, larger, more mature firms might tend to have more foreign earnings than smaller firms and might *also* pay dividends at higher rates, for reasons unrelated to their foreign earnings. Then η would take a value greater than one even though greater foreign earnings themselves would not stimulate large dividend payments if those earnings accrued to smaller firms.

The concern that some kind of spurious correlation accounts for the apparent relationship between foreign earnings and large domestic dividend payments can be addressed in part by exploiting the (limited) panel nature of the Compustat data. One difficulty in so doing is that payout rates for all

firms may vary from year to year in response to aggregate conditions, and this possibility must be accomodated explicitly.

Suppose that (3) is modified to include time-invariant firm-specific effects:

$$D_{it} = \gamma_i + [E_{it} + \eta F^*_{it}]\psi_t + \epsilon_{it} \qquad (5)$$

In this specification γ_i could capture systematic payout differences between firms with extensive foreign operations and those that earn most of their profits domestically, as long as the firm's characteristic does not change over the 1984-1989 period. For example, the firm's payment of dividends out of "permanent" earnings might be reflected in γ_i. Firm-specific effects can be removed by subtracting both sides of (5) from their lagged values:

$$D_{it} - D_{i,t-1} = \beta_{1t}E_{it} + \beta_{2t}F^*_{it} + \beta_{3t}E_{it-1} + \beta_{4t}F^*_{it-1} + u_{it} \qquad (6)$$

in which $\beta_{1t} = \psi_t$, $\beta_{2t} = \eta\psi_t$, $\beta_{3t} = -\psi_{t-1}$, $\beta_{4t} = -\eta\psi_{t-1}$, and $u_{it} = (\epsilon_{it} - \epsilon_{it-1})$. The model implies that $\beta_{2t}/\beta_{1t} = \beta_{4t}/\beta_{3t} = \eta$, $\forall$ t. This restriction can be imposed directly and the model estimated in nonlinear form, in order to test the restriction and to make more precise the estimate of η, the parameter of primary interest. Another implied restriction is that $\beta_{jk} = -\beta_{jk-1}$ $\forall$ j,k.

Column one of Table 7 presents pooled nonlinear estimates of (6) over the time period 1984-1989. The year coefficients (ψ_ts) exhibit some variability, and are generally small, the largest being 0.07 for 1988 and 0.16 for 1989. The estimate of ψ_{1984}, 0.004, is not significantly different from zero. First-differencing the data may have the effect of lowering the signal-to-noise

ratio and thereby losing some precision in the estimates; and in any case, the regressions do not seem to fit very well on the 1984 data. Nevertheless, the estimated value of η, 1.6, is consistent with the cross-sectional results and is significantly different from 1. The estimated value of η is much greater when the period 1986-1989 is considered in isolation, as indicated by the estimates in column two of Table 7. For the 1986-1989 period η is estimated to be 4.1 (with a standard error of 0.9), and the year coefficients vary between 0.07 and 0.11.

It is useful to explore whether the result that $\eta > 1$ appears in other models of the dividend process, such as Lintner's partial adjustment framework. Unfortunately, the very short nature of the available panel makes it impossible to identify the firm-specific coefficients of a standard Lintner model such as (1). An alternative is to impose that the coefficients of the Lintner model are the same for all firms (and possibly varying over time, in response to tax and other changes). Then it is possible to estimate a Lintner-type model of the form:

$$\Delta D_{it} = \beta_{1t}E_{it} + \beta_{2t}F^*_{it} + \beta_{3t}D_{it-1} + \epsilon_{it} \qquad (7)$$

in which desired dividends in year t equal $(\beta_{1t}E_{it} + \beta_{2t}F^*_{it})$.

Table 8 presents estimates of (7) for years 1985-1989. The equation in column one, with $(D_{1985} - D_{1984})$ on the left side, is miserably estimated, while the other years have coefficients that are reasonably consistent with earlier results. The estimated coefficient on foreign earnings is uniformly greater than the coefficient on domestic earnings, though standard errors are so large that the difference is statistically significant only for 1989-1988.

Inclusion of a constant term on the right side of (7) does not change any of the estimates appreciably, and the constants are generally insignificant.[18]

Two difficulties arise in interpreting the results in Table 8. One is that the presence of a lagged dependent variable on the right side makes it difficult to identify separately the effect of lagged dividends from (possibly) autocorrelated residuals. Equation (7) was re-run with instrumental variables, instrumenting for lagged dividends with twice-lagged foreign and domestic earnings (except for the 1985 equation, which used 1984 earnings). The results did not differ from the OLS estimates.

The second difficulty in interpreting estimates of (7) is that they are subject to the same, possibly spurious, correlation as are the cross-section estimates: if an unobserved characteristic of firms is correlated in the same way with dividends and with foreign earnings, then foreign earnings will appear to generate dividends. The presence of a fixed effect can be corrected by first-differencing (7), though this procedure can run afoul of the usual problem of raising the noise level in the regression.

Differencing (7) while maintaining year-specific slope coefficients and imposing that $\beta_{2t} = (1+\eta)\beta_{1t}$ $\forall$ t yields:

$$(D_{it} + D_{it-2} - 2D_{it-1}) = b_t(E_{it}+\eta F^*_{it}) + d_t D_{it-1} - b_{t-1}(E_{it-1}+\eta F^*_{it-1}) - d_{t-1}D_{it-2} + \epsilon_{it} - \epsilon_{it-1} \qquad (8)$$

Table 9 presents estimates of (7) and (8), pooling the data over the

[18]The estimates of (7) reported in Table 8 were also re-run with F^*_t replaced by its constituent parts, F_t and Tax^*_t. The results were similar to those reported in Tables 1-6: coefficients on Tax^*_t were generally negative and of the same magnitude as coefficients on F_t, though standard errors were large.

whole sample period. The original model (7) performs rather well over the whole sample (column 1), and more convincingly in the period 1986-1989 (column 2), with an estimated η value of 3.0 in 1985-1989 and 3.7 in 1986-1989. The year coefficients b_{1986} and d_{1986} take values that are within the ranges implied by Lintner-type partial adjustment models when the system is estimated over the 1986-1989 period. Estimates of b_{1986} and d_{1986} change significantly when data for 1985 are included, which may reflect the poor fit of the 1985 equation reported in column 1 of Table 8.

Estimates of the differenced equation (8) are reported in column 3 of Table 9. Here, too, the estimate of η (4.1) is significantly greater than one. The estimates of d_t are, however, significantly greater than one in absolute value, which would imply an explosive adjustment process in a Lintner framework. The same problem arises in estimates of (8) run on individual years (not reported). Whether this problem arises from measurement error or from some general misspecification intrinsic to the Lintner model is unclear.

The panel estimates exhibit a pattern in which foreign earnings stimulate dividend payments at greater rates than do domestic earnings. Over the period 1986-1989 foreign profits appear to have three to four times the effect of domestic profits on dividend levels. The next section examines the same issue with aggregate data that offers the advantage of being more precisely measured than firm-level data.

5. Foreign Earnings and Domestic Dividends: Time Series Evidence.

The analysis in this section exploits the time-series variation in the ratio of foreign to domestic earnings to specify and test a simple aggregate representation of the dividend process for US firms. Time series data offer

an opportunity to identify the effect of foreign earnings in a way that avoids some of the limitations of the available cross sectional variation, since all US corporations are included, variables are more carefully measured, and it is possible to identify the foreign countries in which US firms have earnings. Nonetheless, it is clear that in drawing inferences from an aggregate time series specification one should bear in mind the underlying *firm-level* determinants of payout behavior.

In estimating a time-series model built on firm-level foundations, it is necessary to impose linear processes on the data in order to preserve functional forms under aggregation. Return to the firm-level model of (3), with the constant term excluded:

$$D_{it} = (E_{it} + \eta F^*_{it})\psi_t \qquad (9)$$

The advantage of (9) is that its form is unchanged by aggregation.

In order to estimate variants of (9) it is necessary to define ψ_t. It is possible to choose ψ to reflect the performance of the corporate sector relative to the rest of the economy. If the economy is having a "bad" year then the prospect for future corporate earnings is less optomistic than otherwise. Firms that target their dividends with permanent earnings in mind might pay particular attention to the profitability of the corporate sector relative to the rest of the economy, reasoning that the aggregate corporate profits ratio follows mean reversion. The following specification is consistent with such a picture:

$$\psi_t = [\phi_1 + \phi_2(E_t + \eta F^*_t)/GNP_t]^7 \qquad (10)$$

in which E_t and F^*_t represent economy-wide aggregate domestic after-tax corporate earnings and aggregate after-tax foreign earnings, respectively; GNP_t is US GNP in year t, and γ a common parameter. The restrictions suggested by mean reversion are: $\phi_1 > 0$, $\phi_2 < 0$, and $\gamma > 0$. Adding (10) to (9):

$$D_{it} = (E_{it} + \eta F^*_{it}) [\phi_1 + \phi_2(E_t + \eta F^*_t)/GNP_t]^\gamma \quad (11)$$

Define π_t to be total after-tax earnings, the sum of domestic after-tax earnings and foreign after-tax earnings, $\pi_t = E_t + F^*_t$. Summing (11) over all firms i and normalizing by aggregate profits, π_t, yields:

$$D_t/\pi_t = [1 + (\eta-1)F^*_t/\pi_t] \phi_1^\gamma [1 + \phi_2(E_t + \eta F^*_t)/(\phi_1 GNP_t)]^\gamma \quad (12)$$

Define α_t to be the ratio of foreign after-tax earnings to total after-tax earnings, $\alpha_t = F^*_t/\pi_t$. Assuming that the bracketed terms on the right side of (12) are both close to one, the logs of both sides of (12) can be approximated by a first-order Taylor series approximation:

$$\log(D_t/\pi_t) \approx (\eta-1)\alpha_t + \gamma\log(\phi_1) + (\gamma\phi_2/\phi_1)E_t/GNP_t + (\gamma\phi_2/\phi_1)\eta F^*_t/GNP_t \quad (13)$$

In estimating (13) on time series data one is instantly struck by the presence of significant first-order autocorrelation in the residuals.[19] An

[19]The Durbin-Watson statistic in unconstrained estimates of (13) takes values (depending on the specification) of 0.60-0.97. When $\log(D_{t-1}/E_{t-1})$ is moved from the left side to the right side of (14), its estimated coefficient equals 1.002. Estimating (13) in first differences appears to be the most reasonable strategy.

alternative first-difference specification is:

$$\Delta \log(D_t/\pi_t) = \beta_1 \Delta \alpha_t + \beta_2 \Delta E_t/GNP_t + \beta_3 \Delta F^*_t/GNP_t \quad (14)$$

The theory implies that $\beta_1 = (\eta-1)$, $\beta_2 = (\gamma\phi_2/\phi_1)$, and $\beta_3 = (\eta\gamma\phi_2/\phi_1)$. The estimation of (14) is linear in parameters when run without imposing the restriction that $(\beta_1+1)\beta_2 = \beta_3$.

Column one of Table 10 presents unconstrained estimates of (14) on the US data over the period 1950-1986 as described in section 2.[20] The striking result of this estimation is the similarity of the estimated η to the estimates from the firm-level data: again it appears that dividend policy responds more strongly to foreign earnings than to domestic earnings. In the unconstrained version of the estimation in column 1 there are two available estimates of η: (β_1+1) and β_3/β_2, the estimated values of which are 4.5 and 15.1 respectively. The latter estimate, which is rather high, represents the ratio of two estimated coefficients and has a standard error of considerable size.

There are several ways to expand the specification of (14). Over the time period covered the tax cost (to shareholders) of receiving dividends changed relative to the tax cost of accrued capital gains; firms that are concerned with the welfare of their shareholders might be expected to adjust their payout decisions in response to movements in this ratio. Denoting the relative tax price by θ, the implication of this view is that dividends would

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[20]In order to facilitate comparability between domestic and foreign earnings, corporate profits were used without the NIPA IVA and CCA adjustments. The time series regressions were re-run adding the CCA to domestic profits, with results that were very close to those in the text.

respond positively to θ.[21] Suppose that the dividend equation takes the form:

$$D_{it} = (E_{it} + \eta F^*_{it}) \; [\phi_1 + \phi_2(E_t + \eta F^*_t)/GNP_t]^{\gamma} \; e^{\mu\theta} \qquad (15)$$

In this specification the elasticity of dividend payouts to a change in θ equals $\mu\theta$.[22] When transformed (15) can be estimated in the same fashion as (14), by adding $\Delta\theta$ to the right side (with its coefficient implied to be μ). Column 2 includes $\Delta\theta$ on the right side; while it enters with the right sign, its coefficient is insignificant.

Another development over this time period was the dividend control regime introduced by the Nixon administration in 1971-1974, in which firms were discouraged from paying dividends much in excess of historic levels. Including a dummy variable for the Nixon controls yields the results in column 3: the dummy is negative and just significant, while the other coefficients are substantially unaffected by its inclusion.[23]

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[21]The tax cost parameter θ is taken from Poterba (1987b); it is defined as a weighted average of (1-m)/(1-z), in which weights reflect shareholders in the population, m is the marginal tax rate on shareholder dividend receipts and z is the shareholder's accrual-equivalent capital gains tax rate. Poterba finds a generally significant effect of θ on dividend payout behavior.

[22]In the empirical work it is difficult to distinguish the specification (15) from a similar specification in which $\mu\theta$ enters multiplicatively, since (once transformed) $\Delta\theta$ is quite close to $\Delta\log(\theta)$ for θ close to one. In interpreting estimates of μ it is worthwhile to bear this sensitivity in mind.

[23]Voluntary dividend restraints were introduced as part of the wage and price controls on November 14, 1971, and removed on April 30, 1974. I follow Poterba (1987b) in assigning the dummy variable a value of one in years 1972-1974, so that in estimating the equation in differences the Nixon dummy takes a value of -1 in 1972 and 1 in 1975.

The simple linear specification of (14) ignores the implied restriction among the coefficients; since the restriction is nonlinear $[(\beta_1+1)\beta_2 = \beta_3]$ its imposition requires nonlinear estimation. Columns 4-6 of Table 10 presents those estimates. While the estimated parameters change somewhat from the simple linear specification, the message remains the same: foreign earnings influence dividend behavior more strongly than do domestic earnings. The estimated value of η ranges from 2.82 to 2.64, and the coefficient on $\Delta\theta$ becomes significant.

The estimated equations reported in Table 10 can be generalized along a number of dimensions. When included, a constant term was always insignificant and did not affect any of the other estimated coefficients. The specification (14) can be modified slightly by taking $\Delta \ln(\pi_t)$ to the right side; the estimates in Table 10 impose a unit coefficient on that term. When estimated in unconstrained form the coefficients on $\Delta \ln(\pi_t)$ lie between 0.84 and 0.86 and are not significantly different from one (though are significantly different from zero), while the other estimated coefficients do not change significantly. The regressions were re-run adding share repurchases and acquisitions on the left side of (14), and a very poor fit was obtained, suggesting that these alternative forms of cash distribution have markedly different sources than do dividends.

It is possible to decompose aggregate foreign earnings into some of its constituent parts. A question that naturally arises in this context is whether changes in foreign earnings due only to foreign exchange rate movements have the same impact on firms as do changes in foreign earnings that arise from changed profitability independent of exchange rate movements. The relative importance of foreign exchange earnings is difficult to predict: one

might argue that if exchange rates exhibit mean reversion then foreign exchange gains are ephemeral and would therefore stimulate fewer dividends than would changes in foreign-denominated profitability. Alternatively, a rise in foreign earnings due to a devalued dollar also raises the dollar-denominated value of *all* foreign assets, and this capital gain, which is correlated with foreign exchange earnings on contemporaneous profits, might stimulate a significant rise in dividends paid.

For practical purposes there is no perfect decomposition of foreign earning changes into profitability changes and exchange rate movements. One method is to identify the earnings from foreign exchange fluctuations in year t as the change in dollar-denominated foreign earnings the firm would have had in year t if foreign profits had remained constant at their t-1 level but had changed in dollar terms through the exchange rate. Denote this measure of foreign earnings by F', and the ratio of F' to total domestic and foreign earnings by α'. Subtracting F' from total foreign earnings yields one measure of foreign earnings unaffected by exchange rate movements, denoted $\underline{F}$ (with corresponding ratio $\underline{\alpha}$); naturally, $\underline{F} + F' = F^*$ (and $\underline{\alpha} + \alpha' = \alpha$). Then equation (14) can be modified to:

$$\Delta \log(D_t/\pi_t) = \beta_1\Delta\underline{\alpha}_t + \beta_2\Delta\alpha'_t + \beta_3\Delta E_t/GNP_t + \beta_4\Delta\underline{F}_t/GNP_t + \beta_5\Delta F'_t/GNP_t \qquad (16)$$

in which the implied coefficients are $\beta_1 = (\eta\text{-}1)$, $\beta_2 = \xi(\eta\text{-}1)$, $\beta_3 = (\gamma\phi_2/\phi_1)$, $\beta_4 = (\eta\gamma\phi_2/\phi_1)$, and $\beta_5 = \xi(\eta\gamma\phi_2/\phi_1)$. The parameter ξ reflects the impact of foreign exchange earnings relative to foreign earnings independent of exchange rate movements; if $\xi = 1$ then both sources of foreign earnings have equal impact on dividends.

Table 11 presents estimates of (16). In both the unconstrained OLS versions of (16) (columns 1-3) and the constrained nonlinear versions (columns 4-6) the estimated value of ξ is well below one and not significantly different from zero. Unfortunately, it is difficult to draw a precise conclusion from these regressions, since the estimated value of ξ is also not significantly different from one. The trouble is that foreign exchange changes move too closely with changes in foreign profitability for the data to distinguish them completely in the regression. The estimates in Table 11 are suggestive of a value of ξ between zero and one, but not at all conclusively.

One implication of signalling models might be that the more remote and unfathomable an earnings source, the more the market might demand tangible signals of (reported) earnings. Table 12 presents regressions in which foreign earnings are broken apart by national origin, in a manner akin to the decomposition used in (16). Thus, in the first column of Table 12, $\Delta\alpha'$ measures the change in the ratio of Canadian to total (foreign plus domestic) profits, while $\Delta\underline{\alpha}$ is the change in the ratio of non-Canadian foreign profits to total profits. Large estimated standard errors make the results generally inconclusive, except for the large effect on dividends of earnings in developing countries. This result is consistent with a signalling interpretation of dividends, but may be consistent with other explanations.

Similar results appear in estimates of Lintner-type equations on aggregate data, though some difficulties appear with the Lintner specification. Taking D_{t-1} to the right side of a Lintner-type equation (7) and aggregating yields:

$$D_t = [\beta_1 E_t + \eta\beta_1 F^*_t + \beta_2 D_{t-1}] \qquad (17)$$

in which theory implies that $\beta_2 = (1-\lambda)$, with λ the adjustment parameter $(0<\lambda<1)$, and $\beta_1 = \lambda r$, with r the desired payout rate $(0<r<1)$.

Dividing both sides of (17) by π_t, taking logs, and using a first-order Taylor approximation yields:

$$\log(D_t/\pi_t) = (\lambda r-1) + \lambda r(\eta-1)F^*_t/\pi_t + (1-\lambda)D_{t-1}/\pi_t \qquad (18)$$

The first three columns of Table 13 report the results of estimating first differences of (18) on aggregate data. The Lintner model is not successful in these estimates, since the estimated coefficients imply that $\lambda < 0$, which characterizes explosive behavior. While it is not possible to identify η in the first-difference specification, the negative and significant coefficient on $\Delta\alpha_t$ is consistent with $\eta > 1$ and $\lambda < 0$.

Columns 4-6 of Table 13 present regressions of the level form of (18), using a maximum likelihood AR(1) correction (though coefficients were not substantially different from OLS regressions of (18) without the AR(1) correction). Values of $\lambda < 0$ and $\eta > 1$ are again implied by the estimates, which are consistent with the earlier estimates of η but also suggest that the Lintner-style models often encounter the problem of implying explosive adjustment behavior.[24] It is clear that there is only qualified empirical support for the Lintner-type specification with coefficients that are common to all firms. At the same time, it is also clear that the time series results

[24]A number of other specificatons produced similar results. The $\lambda < 0$ result appears in a more traditional specification of the Lintner model in which foreign and domestic earnings are constrained to have the same coefficient. The time series results were substantially unchanged when F^*_t was replaced by F_t; they were similarly unchanged and the new coefficient insignificant when D_{t-2} was included as a right-side variable (as suggested by Lee et al., 1987).

are quite consistent with the panel results in suggesting that foreign earnings stimulate greater dividend payouts than do domestic earnings.

6. Implications.

The firm-level and aggregate regression results indicate that US corporations pay dividends out of their foreign earnings at about three times the rate that they do out of their domestic earnings. There are a number of reasons to have expected foreign earnings to stimulate *fewer* dividends than domestic earnings do. The tax cost of repatriating earnings from low-taxed foreign locations gives firms incentives to reinvest earnings abroad rather than repatriate them, if profitable foreign investments can be found. Some foreign governments control tightly the abilities of multinationals to withdraw funds from their countries. And if foreign earnings are viewed by home management as less reliable and therefore less permanent than domestic earnings, they might be expected to stimulate fewer dividends than domestic earnings.

Nevertheless, it appears that the opposite is true. The need to signal profitability to investors may explain the impact of foreign earnings on dividends. The signalling explanation relies, however, on both the desire of managers to signal profitability and the need to convey a particularly strong signal in the case of foreign earnings. The first is the subject of some controversy (reviewed in section 3), and while the second is not controversial, it has not really been explored. The signalling explanation of dividends posits that earnings reports are manipulable by managers and therefore only mildly informative to outside investors. Therefore, the behavior described in this paper is consistent with a model in which firms

feel the need to signal their foreign earnings *both* by reporting them *and* by confirming them with dividend payouts.

There are other possible explanations for the effect of foreign earnings on dividends. If agency problems are particularly acute in the case of foreign subsidiaries, then investors might insist on high payout rates from foreign operations to domestic managers, who in turn would be expected to distribute that cash to shareholders. This agency explanation implies, however, that subsidiaries would remit dividends to parent firms in a steady fashion, which they do not do,[25] and might not carry a direct implication for dividend payments by parent firms to *shareholders*. A different kind of contracting problem might explain the linkage between dividend payouts and foreign earnings if bond covenants encumber foreign and domestic profits to different degrees, leaving shareholder-oriented management that has an incentive to distribute cash at the expense of bondholders with the ability to do so out of foreign earnings. There is little direct evidence that bond covenants have this feature, however.[26]

A similar objection applies to risk-based explanations of the effect of foreign earnings. If money held abroad is risky, then firms might be expected to repatriate their earnings, and (possibly) pay dividends with the repatriated funds. This explanation encounters the difficulties that firms often do not repatriate their earnings; that risk considerations apply to the stock of foreign investment, not to the disposition of flow earnings, and that

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[25]See Hines and Hubbard (1990), who find that only 16% of the controlled foreign corporations of US multinationals repatriated dividends to their parent firms in 1984.

[26]See Smith and Warner (1979) and Kalay (1982b) for evidence on some of the behavior covered by bond covenants.

the stock of foreign investment by US firms grows steadily; while even if repatriated, foreign earnings need not stimulate dividends to shareholders at an unusual rate.

It is possible that US firms systematically understate their foreign earnings, either for tax or for regulatory reasons; if so, then the estimated coefficient on foreign earnings might in part pick up the degree of understatement. There is evidence that US firms adjust transfer prices to choose the location of their profits (within limits) to minimize their worldwide tax liabilities,[27] but the difficulty with this explanation is that it postulates that firms underdeclare their profits in some foreign locations *without* declaring those profits to be earned anywhere else. Furthermore, given the ability of US firms to select the location of their foreign operations, one would usually expect foreign earnings to be *over*stated (in low-tax countries) at the expense of domestic earnings.

The effect of foreign earnings on dividends is consistent with a "permanent income" model of dividends if changes in contemporaneous foreign earnings are better predictors of changes in future earnings than are changes in contemporaneous domestic earnings. The firm-level data do not, however, support such a conclusion: in regressing domestic and foreign earnings on lagged values of each (not reported), there is no clear pattern of significance to the coefficient on lagged foreign income (in fact, the coefficient is negative in some cases). A similarly indeterminate pattern appears in time series regressions of domesic and foreign earnings on each other. In the "permanent earnings" dividend model of Marsh and Merton (1987), managers adjust their dividend payouts to changes in permanent earnings as

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[27]See, for example, Hines and Rice (1990).

reflected in stock price changes. One possibility is that the market reacts very favorably to foreign earnings announcements, whether or not they correspond to permanent income sources, driving up stock prices and also driving up the dividends of firms that try to maintain their ratios of dividends to share value. This paper does not explore the effect of foreign profits on stock prices.

It is likely that there are several consequences of the propensity of US corporations to pay dividends at high rates out of their foreign earnings. One consequence, mentioned in Section 1, is that the US government collects tax revenue contemporaneously on foreign earnings, even if those earnings are unrepatriated, as long as they stimulate dividends that trigger individual income taxes. These individual income taxes may exceed the direct corporate tax revenue collected on the foreign earnings of US multinationals.[28]

Table 14 offers some estimates of the annual contributions of foreign earnings to US tax revenue through the corporate income tax and through taxes on dividend income. The first two columns present annual corporate income tax revenue based on NIPA data described in Section 2. Very little corporate tax revenue is collected from foreign sources: of $106.3 billion in corporate tax revenue in 1986, only $8.13 billion (7.65%) was attributable to foreign earnings, even though the foreign fraction in 1986 was at its highest level

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[28]Of course, if all corporate profits are ultimately distributed to stockholders then the US government will eventually get tax revenue from the foreign earnings of US corporations through the individual income tax; the only questions are *when* and *how much* (in present value). The government also receives tax revenue from undistributed foreign profits through the tax on individual capital gains, since foreign profits raise the values of shares held by individuals; these revenues are not included in Table 14. Additionally, the dividends received by corporations are subject to taxes at low effective rates (see footnote 7) that are not included in the calculations reported in Table 14 because necessary data are not available.

for the 1950-1986 period.

Column 5 of Table 14 presents estimates of tax revenues from dividend taxes over the period 1950-1986, measured as total dividend payments by US corporations to US recipients multiplied by the effective tax rate on dividends received by domestic shareholders.[29] Columns 3 and 4 offer two interpretations of the contribution of *foreign* earnings to this tax revenue from dividends. Column 3 presents calculations of the average effect of foreign earnings on dividend tax revenue: its entries equal $\tau_{div}D_t(\eta F^*_t/(E_t+\eta F^*_t))$, taking η to equal 2.82, its estimated value in column 4 of Table 10. A comparison of columns 3 and 1 of Table 14 reveals that tax revenue from dividends generated by foreign earnings approximates the direct corporate tax revenue generated by those earnings, and that since 1976 the dividend tax revenue has exceeded the corporate tax revenue.

The estimated value of η used to calculate the entries in column 3 of Table 14 comes from a nonlinear model (equation 11) of the relationship between aggregate dividends and aggregate profits. The *marginal* contribution of foreign earnings to domestic dividend tax revenue can be calculated by using that model to predict the lost dividend tax revenue if foreign profits were zero and domestic profits were unchanged. Column 4 reports that calculation, based on actual dividends paid and the estimated parameters η and β from column 4 of Table 10.[30] These entries are also of the same order of magnitude as those in columns 1 and 3, though they are generally smaller than

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[29]These calculations are based on data kindly provided by James Poterba. The methodology underlying the effective dividend tax rate calculations is described in Feldstein et al. (1983) and Poterba (1987b).

[30]Since the parameter γ is never estimated directly, these calculations are based on the same logarithmic approximation used to derive (13). The numbers in column 4 equal $Div_t(1-[E_t/(E_t+\eta F^*_t)]\exp(-\beta\eta F^*_t/GNP_t))$.

those in column 1.

The foreign earnings of US corporations are important for many reasons beyond the tax revenue they generate. Foreign operations are already responsible for a sizable fraction of US corporate profits, one that can be expected to grow in the future. It is worth bearing in mind that this source of profitability is likely to have important consequences for the behavior of US firms even in domestic markets. Already some of the consequences are apparent in the dividend payout behavior of firms with foreign earnings. No doubt there are other effects on employment, investment, and financing decisions. As is the case with tax revenues, many of the effects of worldwide activities operate to further domestic policy objectives. In part, the challenge presented by global markets may be how best to adapt other domestic policies in response to growing foreign influences.

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FIGURE 1.

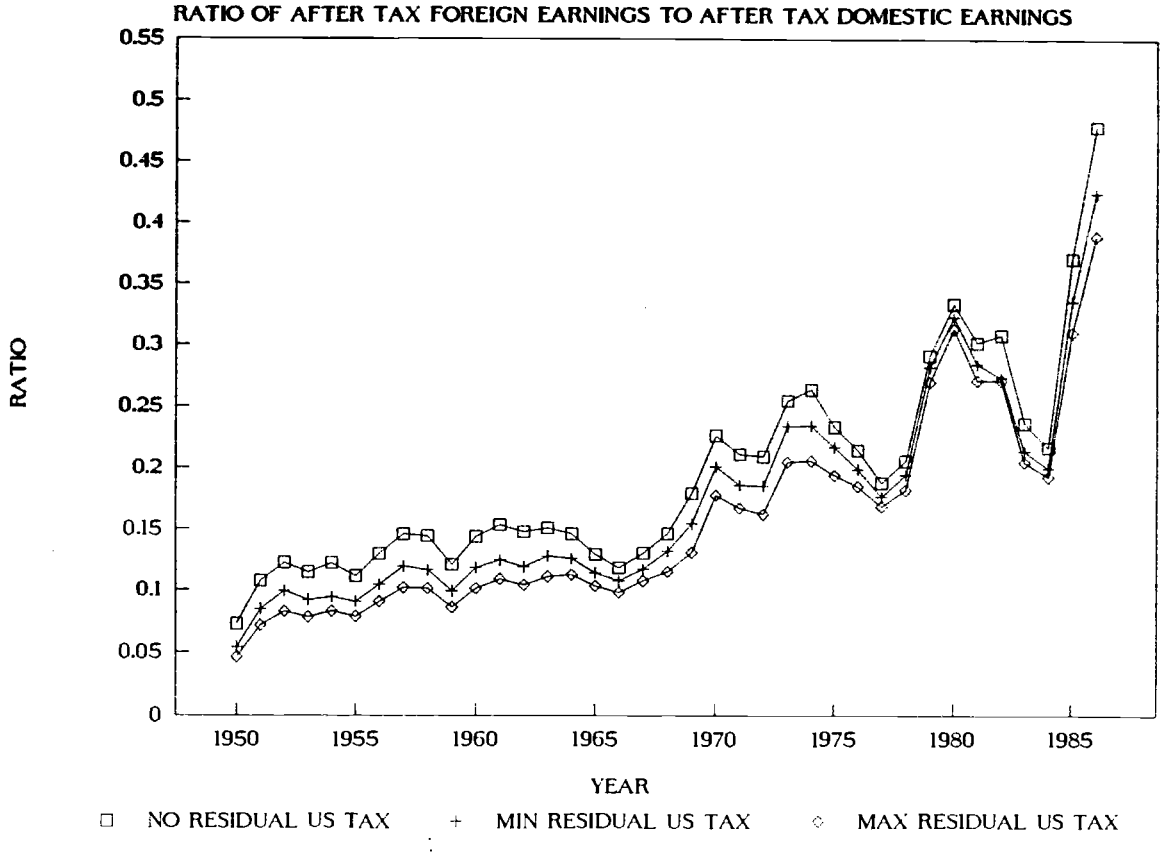
RATIO OF AFTER TAX FOREIGN EARNINGS TO AFTER TAX DOMESTIC EARNINGS
RATIO
0.55
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
1950
1955
1960
1965
1970
1975
1980
1985
YEAR
NO RESIDUAL US TAX
MIN RESIDUAL US TAX
MAX RESIDUAL US TAX

FIGURE 2.

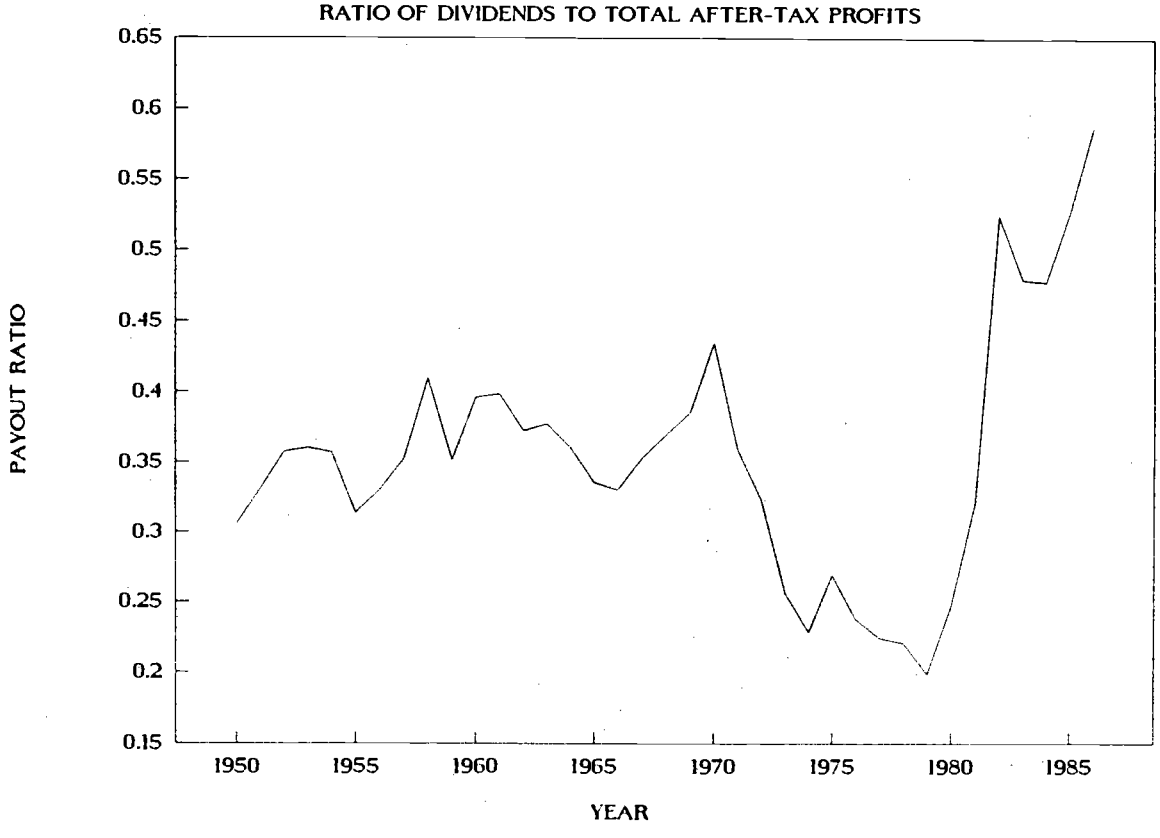
RATIO OF DIVIDENDS TO TOTAL AFTER-TAX PROFITS
PAYOUT RATIO
0.65
0.6
0.55
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
1950
1955
1960
1965
1970
1975
1980
1985
YEAR

Table 1

Dividend Payouts by Compustat Firms, 1984

	Dependent Variable: Common Dividends					
	OLS	OLS	OLS	OLS	OLS	NLS
constant	6.684 (3.142)					
E	0.3112 (0.0455)	0.3150 (0.0444)	0.3146 (0.0439)	0.3135 (0.0442)	0.2059 (0.0486)	0.3241 (0.0128)
F	0.4075 (0.1061)	0.4105 (0.1087)	0.4390 (0.1229)			
Tax*			-0.7496 (0.7739)			
F*				0.4318 (0.1181)	0.6333 (0.1664)	
E squared (x 100)					0.0096 (0.0020)	-0.00072 (0.00012
F* squared (x 100)					0.0535 (0.0327)	
EF* (x 100)					-0.0472 (0.0165)	
η						1.9110 (0.2011)
R^2	.86	.87	.88	.88	.90	.87
n	450	450	450	450	450	450

Note: Values in parentheses (except in the last column, the nonlinear least squares estimates) represent White-corrected standard errors. E is domestic after-tax profits and F is foreign after-tax profits; Tax* is the residual US tax due upon repatriating foreign profits, and F* = F - Tax*.

Table 2

Dividend Payouts by Compustat Firms, 1985

Dependent Variable: Common Dividends

	OLS	OLS	OLS	OLS	OLS	NLS
constant	16.412 (3.823)					
E	0.2692 (0.0538)	0.2781 (0.0534)	0.2900 (0.0502)	0.2820 (0.0531)	0.1393 (0.0717)	0.2933 (0.0163)
F	0.4990 (0.0995)	0.5051 (0.1019)	0.5389 (0.1034)			
Tax*			-0.8833 (0.6363)			
F*				0.5365 (0.1011)	0.8601 (0.2827)	
E squared (x 100)					0.0096 (0.0039)	-0.00037 (0.00014
F* squared (x 100)					-0.0204 (0.0310)	
EF* (x 100)					-0.0113 (0.0172)	
η						2.1145 (0.2355)
R^2	.77	.79	.80	.80	.81	.78
n	469	469	469	469	469	469

Note: Values in parentheses (except in the last column, the nonlinear least squares estimates) represent White-corrected standard errors. E is domestic after-tax profits and F is foreign after-tax profits; Tax* is the residual US tax due upon repatriating foreign profits, and F* = F - Tax*.

Table 3

Dividend Payouts by Compustat Firms, 1986

Dependent Variable: Common Dividends

	OLS	OLS	OLS	OLS	OLS	NLS
constant	16.158 (5.757)					
E	0.2274 (0.0478)	0.2353 (0.0469)	0.2450 (0.0452)	0.2454 (0.0473)	0.1067 (0.0383)	0.2430 (0.0151)
F	0.7164 (0.0661)	0.7290 (0.0651)	0.7546 (0.0651)			
Tax*			-0.7276 (0.5984)			
F*				0.7554 (0.0618)	0.7961 (0.1739)	
E squared (x 100)					0.0087 (0.0029)	-0.00073 (0.00031
F* squared (x 100)					-0.0109 (0.0102)	
EF* (x 100)					0.0064 (0.0065)	
η						2.4935 (0.2570)
R^2	.72	.74	.75	.75	.77	.72
n	505	505	505	505	505	505

Note: Values in parentheses (except in the last column, the nonlinear least squares estimates) represent White-corrected standard errors. E is domestic after-tax profits and F is foreign after-tax profits; Tax* is the residual US tax due upon repatriating foreign profits, and F* = F - Tax*.

Table 4

Dividend Payouts by Compustat Firms, 1987

Dependent Variable: Common Dividends

	OLS	OLS	OLS	OLS	OLS	NLS
constant	25.833 (8.246)					
E	0.1165 (0.0456)	0.1240 (0.0491)	0.1258 (0.0433)	0.1263 (0.0427)	0.3265 (0.0467)	0.1311 (0.0193)
F	0.6755 (0.0834)	0.6975 (0.0843)	0.8075 (0.0715)			
Tax*			-0.7722 (0.4239)			
F*				0.8119 (0.0797)	0.6536 (0.1176)	
E squared (x 100)					-0.0004 (0.0007)	-0.00006 (0.00007
F* squared (x 100)					0.0380 (0.0055)	
EF* (x 100)					-0.0353 (0.0057)	
η						6.5948 (1.1876)
R^2	.51	.55	.56	.56	.60	.52
n	522	522	522	522	522	522

Note: Values in parentheses (except in the last column, the nonlinear least squares estimates) represent White-corrected standard errors. E is domestic after-tax profits and F is foreign after-tax profits; Tax* is the residual US tax due upon repatriating foreign profits, and F* = F - Tax*.

Table 5

Dividend Payouts by Compustat Firms, 1988

	Dependent Variable: Common Dividends					
	OLS	OLS	OLS	OLS	OLS	NLS
constant	10.955 (6.086)					
E	0.2384 (0.0557)	0.2487 (0.0538)	0.2421 (0.0556)	0.2411 (0.0549)	0.2200 (0.0443)	0.2482 (0.0222)
F	0.4202 (0.0877)	0.4214 (0.0863)	0.4483 (0.1112)			
Tax*			-0.3440 (0.4921)			
F*				0.4549 (0.0909)	0.4564 (0.0833)	
E squared (x 100)					0.0137 (0.0029)	-0.00022 (0.00025
F* squared (x 100)					0.0237 (0.0025)	
EF* (x 100)					-0.0434 (0.0049)	
η						1.9523 (0.3261)
R^2	.68	.71	.71	.71	.76	.68
n	524	524	524	524	524	524

Note: Values in parentheses (except in the last column, the nonlinear least squares estimates) represent White-corrected standard errors. E is domestic after-tax profits and F is foreign after-tax profits; Tax* is the residual US tax due upon repatriating foreign profits, and F* = F - Tax*.

Table 6

Dividend Payouts by Compustat Firms, 1989

Dependent Variable: Common Dividends

	OLS	OLS	OLS	OLS	OLS	NLS
constant	11.189 (3.993)					
E	0.1791 (0.0434)	0.1886 (0.0416)	0.1906 (0.0373)	0.1869 (0.0443)	0.0959 (0.0760)	0.1794 (0.0191)
F	0.6768 (0.0594)	0.6831 (0.0597)	0.6682 (0.0283)			
Tax*			0.4224 (1.1773)			
F*				0.7025 (0.0673)	0.8709 (0.2256)	
E squared (x 100)					0.0099 (0.0027)	-0.00013 (0.00006
F* squared (x 100)					-0.0084 (0.0065)	
EF* (x 100)					-0.0108 (0.0055)	
η						4.2894 (0.6178)
R^2	.82	.84	.84	.83	.85	.81
n	519	519	519	519	519	519

Note: Values in parentheses (except in the last column, the nonlinear least squares estimates) represent White-corrected standard errors. E is domestic after-tax profits and F is foreign after-tax profits; Tax* is the residual US tax due upon repatriating foreign profits, and F* = F - Tax*.

Table 7

Dividend Payouts by Compustat Firms: Pooled Nonlinear First Differences

Dependent Variable: Δ Common Dividends

Year(s)	1984-1989	1986-1989
E_{1984}	0.00437 (0.00392)	
E_{1985}	0.02257 (0.00384)	
E_{1986}	0.04112 (0.00970)	0.07208 (0.01125)
E_{1987}	0.06750 (0.00772)	0.07795 (0.01028)
E_{1988}	0.07202 (0.00919)	0.06869 (0.00988)
E_{1989}	0.16192 (0.01546)	0.10577 (0.01711)
η	1.60013 (0.20491)	4.07208 (0.85802)
firms	326	402
n	1630	1206

Note: Values in parentheses are asymptotic standard errors. η is the estimated effect of foreign earnings (relative to domestic earnings with unit value); year coefficients represent estimates of β from equations of the form: $\Delta D_t = \beta_t(E_t+\eta F^*_t) - \beta_{t-1}(E_{t-1}+\eta F^*_{t-1})$.

Table 8

Dividend Payouts by Compustat Firms, Lintner Model

Dependent Variable: Δ Common Dividends

Year(s)	1985	1986	1987	1988	1989
E	0.0253 (0.0074)	0.1505 (0.0642)	0.0915 (0.0205)	0.1347 (0.0465)	0.1193 (0.0510)
F*	-0.0135 (0.0119)	0.4183 (0.1841)	0.2990 (0.2016)	0.2031 (0.1083)	0.5245 (0.1642)
Div_{t-1}	0.0244 (0.0153)	-0.5583 (0.2475)	-0.4047 (0.2316)	-0.4313 (0.2265)	-0.6491 (0.2168)
R^2	.47	.34	.12	.22	.48
n	457	493	515	515	510

Note: Values in parentheses represent White-corrected standard errors. E is domestic after-tax profits and F* is foreign profits after foreign taxes and after the residual US tax due upon repatriation to the US.

Table 9

Dividend Payouts by Compustat Firms: Pooled Nonlinear Lintner Models

Dependent Variable:	$Div_t - Div_{t-1}$		$(Div_t + Div_{t-2} - 2Div_{t-1})$
Year(s)	1985-1989	1986-1989	1986-1989
b_{1985}	0.0082 (0.0017)		0.0151 (0.0096)
b_{1986}	-0.0034 (0.0128)	0.1326 (0.0125)	0.0301 (0.0118)
b_{1987}	0.0968 (0.0086)	0.1002 (0.0083)	0.0461 (0.0072)
b_{1988}	0.0694 (0.0103)	0.0616 (0.0085)	0.0555 (0.0079)
b_{1989}	0.1766 (0.0162)	0.1474 (0.0134)	0.1527 (0.0194)
d_{1985}	0.0253 (0.0072)		-1.2587 (0.0650)
d_{1986}	0.0514 (0.0504)	-0.6265 (0.0393)	-1.2817 (0.0681)
d_{1987}	-0.3921 (0.0343)	-0.4842 (0.0356)	-1.3550 (0.0347)
d_{1988}	-0.3354 (0.0461)	-0.3545 (0.0435)	-1.3955 (0.0354)
d_{1989}	-0.6837 (0.0401)	-0.6996 (0.0385)	-1.7864 (0.0443)
η	2.9947 (0.2856)	3.69428 (0.3318)	4.0841 (0.5606)
firms	354	395	354
n	1770	1580	1420

Note: Values in parentheses are asymptotic standard errors. η is the estimated effect of foreign earnings (relative to domestic earnings with unit value). Year coefficients represent estimates of b_t and d_t from equations of the form: $\Delta Div_t = b_t(E_t+\eta F^*_t) + d_t Div_{t-1}$, run once differenced in column 3.

Table 10

Aggregate US Dividend Payouts, 1950 - 1986

Dependent Variable: $\Delta \ln(D_t/\pi_t)$

	OLS	OLS	OLS	NLS	NLS	NLS
$\Delta \alpha_t$	3.527 (0.626)	3.305 (0.667)	3.261 (0.636)	1.820 (0.730)	1.658 (0.657)	1.642 (0.656)
$\Delta (E_t/GNP_t)$	-5.891 (1.724)	-6.519 (1.841)	-6.458 (1.756)	-13.211 (1.433)	-12.765 (1.310)	-12.600 (1.325)
$\Delta (F_t/GNP_t)$	-88.772 (11.065)	-82.411 (12.834)	-78.237 (12.409)	****	****	****
$\Delta \theta_t$		0.584 (0.596)	0.763 (0.576)		1.833 (0.631)	1.845 (0.633)
Nixon			-0.053 (0.026)			-0.034 (0.039)
R^2	.90	.90	.91	.81	.85	.85
D-W	1.763	1.783	2.11			
n	36	36	36	36	36	36

Note: Standard errors in parentheses. The coefficient on $\Delta\alpha_t$, β_1, equals $(\eta-1)$. Columns 4-6 present nonlinear estimates of the equation estimated in columns 1-3, adding the additional restriction that $(\beta_1+1)\beta_2 = \beta_3$.

Table 11

Foreign Exchange Profits vs. Regular Earnings, 1950 - 1986

Dependent Variable: $\Delta \ln(D_t/\pi_t)$

	OLS	OLS	OLS	NLS	NLS	NLS
$\Delta \alpha'_t$	1.578 (1.458)	1.782 (1.471)	1.339 (1.463)	****	****	****
$\Delta \underline{\alpha}_t$	3.745 (0.687)	3.463 (0.741)	3.580 (0.730)	2.921 (0.767)	2.823 (0.696)	2.808 (0.696)
$\Delta (E_t/GNP_t)$	-5.699 (1.841)	-6.531 (2.014)	-4.879 (2.250)	-13.344 (1.420)	-12.664 (1.319)	-12.503 (1.336)
$\Delta (F'_t/GNP_t)$	-42.788 (34.533)	-48.203 (34.920)	-42.492 (35.150)	****	****	****
$\Delta (\underline{F}_t/GNP_t)$	-90.265 (11.666)	-82.404 (13.989)	-83.668 (14.392)	****	****	****
ξ				0.016 (0.982)	0.537 (0.891)	0.547 (0.897)
$\Delta \theta_t$		0.722 (0.710)	0.966 (0.697)		2.111 (0.671)	2.127 (0.674)
Nixon			-0.0050 (0.0340)			-0.033 (0.039)
R^2	.90	.90	.90	.82	.86	.86
D-W	1.758	1.738	1.666			
n	33	33	33	33	33	33

Note: α' and F' are based on foreign exchange profits only; $\underline{\alpha}$ and $\underline{F}$ exclude profits earned on foreign exchange rate movements. The coefficient ξ in the nonlinear regressions is the effect of the foreign exchange component of foreign earnings; if $\xi = 1$ then foreign exchange earnings have the same impact as foreign profits under stable exchange rates.

Table 12

It (Sometimes) Matters Where, 1950 - 1986

Dependent Variable: $\Delta \ln(D_t/\pi_t)$

Special Location:	Canada	Canada + UK	English Speaking	Europe	Developing
$\Delta \alpha'_t$	5.050	1.764	3.814	0.672	7.264
	(5.909)	(3.171)	(2.312)	(1.199)	(2.283)
$\Delta \underline{\alpha}_t$	3.400	4.055	3.529	7.276	2.390
	(0.723)	(0.904)	(1.134)	(1.587)	(0.867)
$\Delta (E_t/GNP_t)$	-5.272	-6.658	-5.806	-3.378	-3.337
	(2.802)	(2.168)	(1.943)	(1.953)	(2.332)
$\Delta (F'_t/GNP_t)$	-130.416	-37.367	-88.273	-9.692	-167.630
	(123.731)	(66.125)	(38.906)	(31.722)	(43.959)
$\Delta (\underline{F}_t/GNP_t)$	-84.554	-106.611	-92.498	-169.717	-59.999
	(15.641)	(22.046)	(21.562)	(31.057)	(19.158)
R^2	.89	.89	.89	.91	.90
D-W	1.768	1.830	1.700	1.660	1.652
n	36	36	36	36	36

Note: Standard errors in parentheses. α' and F' are based on foreign earnings only in indicated regions (e.g., Canada in the first column); $\underline{\alpha}$ and $\underline{F}$ are based on foreign earnings not in the indicated regions. English speaking countries include Australia, the Bahamas, Bermuda, Canada, Ireland, New Zealand, South Africa, and the UK.

Table 13

Aggregate US Dividend Payouts, Lintner Model, 1950 - 1986

Dependent Variable:	$\Delta \ln(D_t/\pi_t)$			$\ln(D_t/\pi_t)$		
	OLS	OLS	OLS	AR(1)	AR(1)	AR(1)
constant				-1.936 (0.053)	-2.285 (0.255)	-2.320 (0.253)
$\Delta \alpha_t$	-1.181 (0.505)	-1.221 (0.538)	-1.164 (0.540)			
α_t				-0.374 (0.226)	-0.750 (0.346)	-0.752 (0.342)
$\Delta (D_{t-1}/\pi_{t-1})$	2.375 (0.205)	2.402 (0.236)	2.356 (0.240)			
(D_{t-1}/π_{t-1})				2.743 (0.138)	2.687 (0.142)	2.640 (0.146)
$\Delta \theta_t$		-0.216 (0.885)	-0.152 (0.886)			
θ_t					0.605 (0.428)	0.686 (0.428)
Δ Nixon			-0.048 (0.046)			
Nixon						-0.034 (0.039)
ρ				0.230 (0.172)	0.250 (0.174)	0.241 (0.177)
R^2	.80	.79	.79	.93	.93	.93
D-W	2.161	2.164	2.111			
n	35	35	35	36	36	36

Note: Standard errors in parentheses.

Table 14

US Tax Revenue, Domestic and Foreign Sources

Year	Corporate Income Tax		Shareholder Dividend Tax		
	Foreign Earnings	Domestic Earnings	Foreign Earnings (Average)	Foreign Earnings (Marginal)	Total
1950	$ 0.64	$ 17.26	$ 0.34	$-0.07	$ 2.98
1951	0.75	21.85	0.51	0.05	3.05
1952	0.76	18.64	0.59	0.13	3.14
1953	0.72	19.58	0.56	0.13	3.12
1954	0.78	16.82	0.58	0.13	3.05
1955	0.85	21.15	0.64	0.05	3.50
1956	1.01	20.99	0.76	0.09	3.72
1957	1.08	20.32	0.84	0.16	3.75
1958	0.91	18.09	0.83	0.27	3.72
1959	0.95	22.65	0.78	0.16	4.00
1960	1.06	21.64	0.92	0.27	4.12
1961	1.11	21.69	0.99	0.32	4.20
1962	1.25	22.75	1.00	0.27	4.40
1963	1.22	24.98	1.15	0.29	4.82
1964	1.12	26.88	1.17	0.22	4.86
1965	1.11	29.79	1.18	0.11	5.21
1966	0.92	32.78	1.20	0.14	5.53
1967	0.99	31.71	1.35	0.28	5.80
1968	1.43	37.97	1.63	0.40	6.63
1969	2.06	37.62	1.75	0.59	6.49
1970	1.77	32.63	2.13	0.99	6.36
1971	1.93	35.77	1.99	0.80	6.21
1972	2.49	39.41	2.04	0.70	6.51
1973	3.32	45.98	2.43	0.52	6.63
1974	4.30	47.50	2.44	0.45	6.65
1975	2.86	48.04	2.65	0.77	7.47
1976	2.73	61.47	2.95	0.51	8.59
1977	2.14	70.86	3.13	0.36	9.71
1978	3.13	80.37	3.81	0.22	11.22
1979	2.97	85.03	5.10	0.12	11.78
1980	2.45	82.35	6.08	1.45	12.97
1981	3.70	77.40	6.99	2.50	16.11
1982	3.01	60.09	6.44	3.94	14.85
1983	3.27	73.93	5.63	3.09	15.36
1984	2.84	91.06	5.78	3.10	16.40
1985	6.24	90.16	7.95	4.82	17.04
1986	8.13	98.17	9.29	6.22	17.74

Note: Dollar amounts are billions of current dollars; entries are based on calculations described in the text.