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Author(s): James R. Hines Jr.
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Dividends and Profits: Some Unsubtle Foreign Influences

JAMES R. HINES JR.*

ABSTRACT

American corporations earn a significant share of their profits from foreign sources, out of which they appear to pay dividends at rates that are three times higher than their payout rates from domestic profits. Why firms do so is unclear, although this behavior is consistent with the use of dividends to signal profitability. This payout behavior implies that a significant part of the U.S. tax revenue generated by the foreign profits of U.S. corporations arises through the taxation of dividends received by individuals, and that the cost of capital may be higher for foreign than for domestic operations.

TWO OF THE CONSPICUOUS facts about American corporate finance in the 1980s are that U.S. corporations paid dividends at very high rates out of their after-tax profits, and that an unusually high fraction of those profits came from foreign (non-U.S.) sources. These events could be related if, for some reason, foreign profits 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 U.S. corporations pay dividends out of their foreign profits at roughly three times the rate that they do out of their domestic profits.

There are three reasons why it is useful to distinguish the effects of foreign and domestic profits on dividend payouts. The first is that any difference may shed light on the underlying determinants of corporate dividend policy. One popular theory is that firms pay dividends to signal profitability. If foreign profits are particularly difficult for investors to verify, then the signaling view of dividends implies that foreign profits should stimulate greater average dividend payouts than do domestic profits.

A second reason to examine the differential impact of foreign and domestic profits is that dividend behavior affects U.S. tax revenue generated by the foreign profits of U.S. corporations. The foreign tax credit system guarantees that the U.S. government collects little corporate tax revenue from the foreign profits of American companies, since U.S. firms receive credits for the taxes their affiliates pay to foreign governments. But corporate profits are taxed

* John F. Kennedy School of Government, Harvard University. I am grateful to Kristen Willard for outstanding research assistance, to her and to Alan Auerbach, Anne Case, Kathryn Dominguez, Mitchell Peterson, James Poterba, René Stulz (the editor), Lawrence Summers, and an anonymous referee for helpful comments on an earlier draft, and to Princeton University's John M. Olin Program for the Study of Economic Organization and Public Policy for financial support.

twice, first at the corporate level and second at the personal level, when U.S. shareholders receive dividends. By stimulating additional dividends, the foreign profits of U.S. corporations may generate more tax revenue through the personal income tax than the same profits do through the corporate income tax.

The third reason to distinguish the effects of foreign and domestic profits on dividend payouts is that payout rates may influence the relative costs of different operations. If dividend payments impose tax costs on shareholders, and corporations feel obligated to pay dividends at high rates out of their foreign profits, then the implied cost of capital is higher for foreign operations than for domestic operations.

Section I of the article traces the recent growth of foreign profits of U.S. corporations, and reviews the relevant tax treatment of foreign income. Section II considers the implications of previous theoretical and empirical work on corporate dividend policy for the connection between dividend payouts and foreign profits. Section III examines the dividend behavior of a panel of U.S. firms in the 1980s, and Section IV considers dividend patterns for the aggregate U.S. corporate sector from 1950–1986; in both cases foreign profits appear to stimulate dividends at a higher rate than do domestic profits. Section V examines the implications of this behavior. Section VI is the conclusion.

I. The Growth of Foreign Earnings

American companies have always done most of their business and earned most of their profits in the United States. In recent years, however, there has been dramatic growth in the fraction of after-tax U.S. corporate profits from foreign sources. Figure 1 plots the time pattern of three different measures of the ratio of U.S. corporations' after-tax foreign profits to their after-tax domestic profits. All three tell a similar story: by the 1980s foreign profits represent an important income source for U.S. corporations. The smallest of these measures, one that subtracts from current foreign profits their associated future U.S. tax liability, indicates that, in 1971, foreign after-tax profits of U.S. corporations were 16.8 percent of their domestic after-tax profits. By 1986 the same ratio was 39.0 percent.

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 profits. The foreign profits of American corporations are subject to the U.S. corporate income tax. The U.S. corporate tax rate is currently 35 percent. In order to avoid subjecting American multinationals to double taxation, U.S. law provides a foreign tax credit for income taxes paid to foreign governments. With the foreign tax credit, a U.S. corporation that earns $100 in a foreign country with a 15 percent tax rate (and a foreign tax obligation of $15) pays only $20 to the U.S. government, since its U.S. corporate tax liability of $35 (35 percent of $100) is reduced to $20 by the foreign tax credit of $15. The foreign tax credit is subject to a number of restrictions, including a limit equal to U.S. tax liability on foreign income: if, for example, the foreign tax rate were 52 percent,

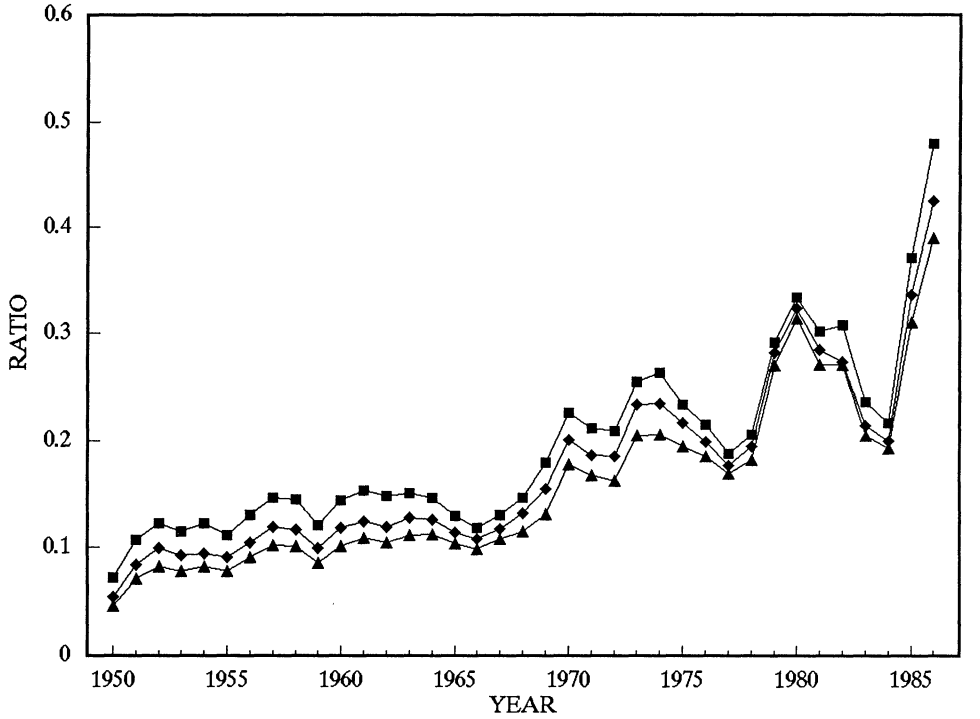

Figure 1. Foreign profits relative to domestic profits. The figure plots ratios of after-tax foreign profits to after-tax domestic profits, by year, for the aggregate U.S. corporate sector. Ratios are constructed using three different measures of after-tax foreign profits. The locus connecting squares (■) plots a ratio based on a definition of after-tax foreign profits as foreign profits minus foreign taxes paid. The locus connecting diamonds (◆) plots a ratio based on a definition of after-tax foreign profits as foreign profits minus the sum of current foreign taxes and current U.S. taxes on foreign-source income. The locus connecting triangles (▲) plots a ratio based on a definition of after-tax foreign profits as foreign profits minus the sum of current foreign taxes, current domestic taxes on foreign-source income, and estimated future domestic taxes on unrepatriated current foreign-source income. Calculations use national income and product account and tax return data.

then the firm pays $52 to the foreign government, but its U.S. foreign tax credit is limited to $35.[1]

In order to compare the foreign profits of U.S. firms to their domestic profits, it is necessary to adjust foreign profits for the U.S. tax due upon repatriation.

[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 percent of a foreign affiliate, and only those taxes that qualify as income taxes are creditable. A U.S. parent firm is taxed on its subsidiaries' foreign income only when repatriated to the parent corporation; as a consequence, the aggregate practice of U.S. multinationals is to repatriate about half of their annual foreign after-tax profits. See Hines (1991a), from which some of the material in this section is derived.

Figure 1 presents three variants of this calculation.[2] The locus connecting square boxes (■) represents the highest of these ratios: it uses a definition of after-tax foreign profits as foreign profits minus foreign taxes paid. In the locus connecting diamonds (◆), the concept of after-tax foreign profit is one that subtracts from foreign profits current foreign taxes and current U.S. taxes on foreign-source income. And the locus connecting triangles (▲) represents the ratio in which after-tax foreign profits are measured as foreign profits, 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 profits in the 1970s and 1980s. There are, no doubt, several factors responsible for this change. First there is the depreciation of the U.S. dollar against major foreign currencies, which has the effect of reducing the value of domestic profits against dollar-denominated foreign profits. Also, the OPEC price increases of the 1970s made U.S. oil companies more profitable in foreign countries.[3] And finally, there is the accumulation of U.S.-owned capital in foreign countries along with changes in its productivity.

Whatever its source, the recent importance of foreign profits coincides with dividend payments by U.S. corporations at rates that are very high by historic standards. Figure 2 plots the ratio of common dividends paid by U.S. corporations to the sum of their after-tax foreign and after-tax domestic profits, in which the least generous measure of after-tax foreign profits (▲) is used. The aggregate dividend payout ratio does not exhibit quite the same secular trend as do the ratios of foreign to domestic profits, but in every year since 1980, the

[2] The ratios in Figure 1 are constructed from national income and product account data tapes obtained from the Bureau of Economic Analysis (BEA) of the U.S. Commerce Department. These data include annual information on foreign profits and reinvested earnings of U.S. corporations. Current U.S. tax obligations on this income are calculated by assuming that firms face statutory U.S. corporate tax rates on their repatriated foreign earnings, and that they receive the aggregate foreign tax credit reported in U.S. Internal Revenue Service (various). The BEA data do not indicate the foreign tax rate on reinvested subsidiary earnings. That tax rate is 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 prior to 1962, the tax rate is estimated based on the ratio of the foreign tax credit to total taxable income. For years after 1982, BEA does not report reinvested subsidiary profits separately from reinvested branch profits; reinvested subsidiary profits are estimated somewhat on the high side by taking branch reinvestments to be zero.) The assumption underlying these figures is that reinvested income faces the same tax rate as repatriated income. Theory and evidence from U.S. multinationals (Hines and Hubbard, 1990) suggests that this procedure might understate the residual U.S. tax liability on foreign income, since firms are likely to repatriate first their heavily taxed foreign income. But some of this foreign income is earned by U.S. multinationals with domestic losses that are effectively untaxed by the United States on their foreign income, so there is no clear direction of bias in the aggregate numbers.

[3] 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.

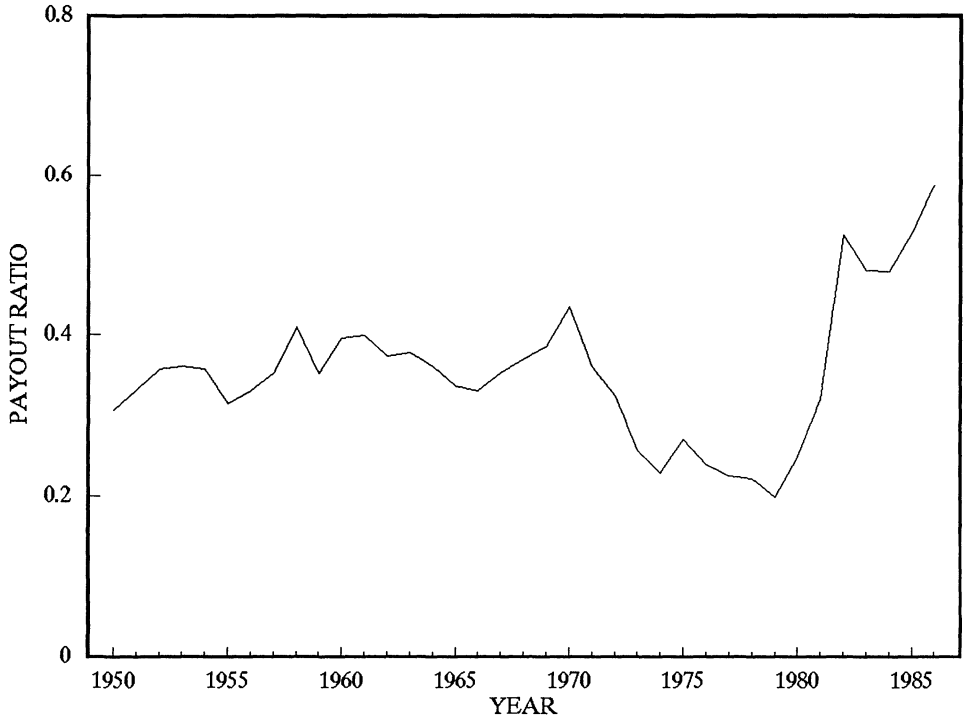

Figure 2. Dividend payout rates over time. The figure plots the ratio of common dividends to after-tax profits, by year, for the aggregate U.S. corporate sector. The numerator of this ratio does not include nondividend distributions to shareholders. After-tax foreign profits are defined as foreign profits minus the sum of current foreign taxes, current domestic taxes on foreign-source income, and estimated future domestic taxes on unrepatriated current foreign-source income. Calculations are based on national income and product account and tax return data.

payout ratio exceeds its previous highest level in the postwar period.[4] The next section considers why the payout ratio might take such a shape.

II. 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 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

[4] Lamdin (1993) offers additional evidence of very high dividend payout rates after 1986. Using a model that does not distinguish foreign from domestic profits, he attributes the high payout rates to tax changes introduced in 1986. 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.

important 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.

Under U.S. law, individual shareholders pay taxes on dividends they receive, while they do not pay taxes on unrealized capital gains. If firms reinvest profits instead of paying dividends, then shareholders receive their returns in the tax-preferred form of capital gains. There are, however, two circumstances in which the tax disadvantage of dividends need not influence dividend payout behavior. 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 limit individuals face on interest expense deductions. While there is some evidence in support of this view, it does not appear to explain the large volume of dividends in the economy.[5] The second circumstance 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.[6]

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 and Meckling (1976).[7] Another possibility, associated with Shefrin and Statman (1984), is that regular dividend payouts are beneficial to individual sharehold-

[5] See Feenberg (1981) on the (limited) empirical significance of binding interest deduction limits. 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 defer realization of their capital gains, 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), Miller and Scholes (1982), Michaely (1991), and Eades et al. (1994) find little effect of dividend taxes on share prices, and Richardson et al. (1986) reports 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.

[6] See the evidence on share repurchases in Shoven (1987) and Bagwell and Shoven (1989).

[7] Two empirical studies find evidence consistent with this view. Barclay and Smith (1988) note 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 evidence that share repurchase announcements widen bid-ask spreads, which is implied by their model. Lang and Litzenberger (1989) find that the market reacts favorably to dividend announcements by firms that would otherwise "overinvest" their funds. But Howe et al. (1992) report that firm characteristics do not appear to influence market reactions to share repurchases and special dividends.

ers 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).

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. It is difficult for firms without profits to pay dividends, but the tax cost of dividends may be greater than necessary to signal earnings, so there remains healthy skepticism about the signaling explanation of dividend behavior.[8] One of the questions that signaling interpretations must address is why dividend payments offer more efficient signals than the tax-favored alternative of share repurchases.[9] Assuming that they do, then certain types of profits may require stronger dividend signals than do other types of profits. If, for example, foreign profits are more difficult for investors to verify than are domestic profits, then foreign profits might trigger greater dividend payments than would an equal amount of domestic profits.

The empirical work on corporate dividend policy has been significantly influenced by Lintner's (1956) model of dividends as the outcome of a partial adjustment process. Based on his interviews with corporate executives, Lintner hypothesizes that firms adjust dividends to "desired" levels that are determined by current profits. He specifies 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 profits, 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 specifies D^* as a linear function of current profits, $D^*_{it} = r_i E_{it}$, in which r_i is a firm-specific payout rate, and estimates (1) on annual data for the United States. The model is the foundation of a number of subsequent empirical dividend studies.[10]

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

[9] This question is addressed by John and Williams (1985), Ambarish, John and Williams (1987), Ofer and Thakor (1987), Williams (1988), Bernheim (1991), and Bernheim and Wantz (1995). The signaling 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).

[10] Tax considerations may influence the level of D^*_{it}, and thereby influence dividend payouts. Feldstein (1970), King (1977), and Poterba and Summers (1985) find a negative correlation between dividend taxes and dividend payouts in aggregate quarterly British time series. Poterba (1987) reports similar results for annual aggregate U.S. data. It should be noted, however, that other studies—such as Auerbach (1982) and Marsh and Merton (1987)—that do not include the tax cost of paying dividends also report reasonably good fits for aggregate annual U.S. data.

There is a second line of research, pursued by Fama and Babiak (1968), that views the dividend process as designed to convey information about future profits. Pettit (1972), Watts (1973), Ang (1975), Laub (1976), DeAngelo et al. (1992), and Kao and Wu (1994) find some support for this interpretation, although 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.

III. Foreign Profits and Domestic Dividends: Cross-Sectional Evidence

The most direct way in which to test the effect of foreign and domestic profits on dividend payouts is to estimate a model of the dividend process in which domestic and foreign profits enter separately. This section examines firm-level evidence on the effect of various profit sources. In Section IV, the analysis is extended to aggregate time series on dividends and profits.

A. The Data

This section analyzes a panel of firm-level data reported by COMPUSTAT over the period 1984–1989. COMPUSTAT culls from a subset of its firms information on their foreign pretax profits and foreign income taxes paid. Firms are not generally required to report the countries in which they earn profits; nor are they required to indicate whether profits were repatriated or reinvested abroad. In a sample of 2800 firms, foreign profits and tax data are available for approximately 500 firms for each of the reporting years. The 326 firms reporting foreign and domestic profits continuously over the whole sample period had about twice the U.S. taxable income of average COMPUSTAT firms, with U.S. federal tax liabilities in 1984 averaging \$48.6 million (vs. \$26.0 million for the COMPUSTAT average), and 1989 tax payments of \$72.3 million (vs. the average liability of \$30.4 million). Table I provides additional detail on the differences between the 1986 COMPUSTAT subsample that reports foreign profits and the 1986 subsample that does not. Firms reporting foreign profits are roughly three times the size (as measured by assets, sales, or employment) of firms that do not report foreign profits, and pay slightly more than double the dividends.

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

$$D_{it} = (\lambda_t + E_{it} + \eta F_{it})\psi_t + \varepsilon_{it} \tag{2}$$

Table I

Characteristics of COMPUSTAT Firms With and Without Foreign Profits, 1986

The sample consists of COMPUSTAT firms distinguished by those reporting nonzero foreign profits in 1986 (described in columns 1–3) and those with zero foreign profits in 1986 (described in columns 4–6). Assets, sales, and common dividends are measured in millions of 1986 dollars; employment is thousands of employees at yearend 1986.

	Firms Reporting Foreign Profits			Firms Not Reporting Foreign Profits		
	No. Obs.	Mean	Std. Dev.	No. Obs.	Mean	Std. Dev.
Assets	563	1137.2	2763.5	1246	436.5	1724.8
Sales	584	3264.9	8843.8	1635	1196.5	4012.4
Employment (thousands)	567	27.613	72.244	1483	8.9133	26.326
Dividends (Common)	616	67.294	205.81	1643	30.636	124.71
Dividends/ Assets	562	0.0427	0.0813	1164	0.1130	0.5384
Dividends/ Sales	583	0.0179	0.0324	1532	0.0552	0.1740

in which D_{it} is firm i's common dividend payout in year t, E_{it} its domestic after-tax profits, F_{it} its foreign after-tax profits, η a parameter common to all firms (and common to all time periods), and λ_t and ψ_t year-specific parameters common to all firms. The parameter η reflects the impact of foreign profits relative to domestic profits; if $\eta = 1$, then both influence dividends equally, while if $\eta > 1$, then foreign profits stimulate more dividends than do an equal amount of domestic profits. The value of η can be inferred by estimating equation (2) and comparing the coefficients on domestic and foreign profits. The linearity of equation (2) implies that aggregate behavior follows the same functional specification as does firm behavior, making it possible to compare the firm-level results in this section to the aggregate estimates in Section IV.

The model (2) was estimated separately for each of the annual cross-sections, 1984–1989; Table II presents estimates for 1986. In the simple linear specification presented in column one, the coefficient on domestic after-tax profits is 0.23, while the coefficient on foreign after-tax profits is 0.72. A comparison of columns one and two indicates that the constant term is unimportant to the regression.

As the discussion in Section I indicates, the appropriate notion of "after-tax" foreign profits is sometimes problematic for U.S. multinationals that earn profits in low-tax foreign jurisdictions from which repatriations generate U.S. tax liability. Because most firms are not required to indicate on their annual reports and 10-Ks the countries in which their foreign profits 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 profits. It is,

Table II

Dividend Payout Regression Equations

The dependent variable is common dividends paid in 1986. E is domestic after-tax profits and F is foreign after-tax profits. Tax* is the residual U.S. tax due upon repatriating foreign profits, and $F^* \equiv (F - \text{Tax}^*)$ is foreign after-tax profits minus the U.S. tax due upon repatriation. Columns 1–5 report ordinary least squares regressions; column 6 reports a nonlinear least squares regression. η is the estimated effect of foreign profits in the nonlinear least squares regression; $\eta = 1$ if foreign and domestic profits influence dividends equally. Values in parentheses are standard errors, which are White-corrected in the ordinary least squares specifications. The sample is COMPUSTAT firms reporting foreign and domestic profits and taxes in 1986.

	OLS	OLS	OLS	OLS	OLS	NLS
Constant	16.158					
	(5.757)					
E	0.2274	0.2353	0.2450	0.2454	0.1067	0.2430
	(0.0478)	(0.0469)	(0.0452)	(0.0473)	(0.0383)	(0.0151)
F	0.7164	0.7290	0.7546			
	(0.0661)	(0.0651)	(0.0651)			
Tax*			−0.7276			
			(0.5984)			
F^*				0.7554	0.7961	
				(0.0618)	(0.1739)	
E squared (×100)					0.0087	−0.00073
					(0.0029)	(0.00031)
F^* squared (×100)					−0.0109	
					(0.0102)	
EF^* (×100)					0.0064	
					(0.0065)	
η						2.4935
						(0.2570)
Adj. R^2	0.72	0.74	0.75	0.75	0.77	0.72
n	505	505	505	505	505	505

however, possible to estimate the potential U.S. tax cost of foreign profits based on a firm's average foreign tax rate from reported financial data.

Column 3 of Table II reports the result of rerunning equation (2) on 1986 data in which the U.S. tax due on repatriating foreign profits is added as an explanatory variable.[11] This change makes little difference to the coefficients on domestic profits and foreign profits, while the residual tax liability has an estimated coefficient of −0.73 (with a large standard error that makes it insignificant). This is a large coefficient, given the voluntary nature of the dividend repatriation decision, but it is not possible to reject the hypothesis

[11] Tax due upon repatriation is taken to equal the maximum of: (i) zero, and (ii) foreign pretax earnings multiplied by the difference between the (current) statutory U.S. tax rate and the effective foreign tax rate, defined as reported foreign taxes divided by reported foreign pretax earnings. This calculation assigns zero value to deferral. Furthermore, the calculation ignores the fact that some of the reported current U.S. federal income tax paid by the firm represents payment of U.S. tax due on repatriated profits. Hence the residual U.S. tax liability as calculated probably represents an upper bound on the true figure.

that the coefficients on foreign profits and residual U.S. 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 those obtained with 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 II present estimates of nonlinear (quadratic) payout models. Suppose that equation (2) were modified to:

$$D_{it} = \psi_{1t}(E_{it} + \eta F^*_{it}) + \psi_{2t}(E_{it} + \eta F^*_{it})^2 + \varepsilon_{it} \qquad (3)$$

in which F^*_{it} represents foreign after-tax profits adjusted for the associated residual U.S. tax liability. There are two forms in which equation (3) 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 profits: the coefficient on (linear) domestic profits is 0.11, while the estimated coefficient on (linear) foreign profits is 0.80. Column 6 presents nonlinear least squares estimates of the same relationship, imposing the restrictions implied by equation (3). The estimated equation exhibits some quadratic curvature (ψ_2 is negative and significant), while the estimated value of η is 2.49 and significantly greater than one. Cross-sectional estimates of equations (2) and (3) for all the years 1984–1989 have similar features.[12]

Estimates of equations (2) and (3) must be interpreted with caution. It is possible that the cross-sectional estimates pick up correlations of foreign profits with payout levels that simply represent correlations with omitted variables. For example, larger, more mature firms might have higher ratios of foreign-source to domestic-source profits than smaller firms do, and might *also* pay dividends at higher rates, for reasons unrelated to their foreign profits.[13] This heterogeneity could take the form that dividends are correlated with firm maturity even after controlling for firm size as reflected by the squared term

[12] Hines (1991b) reports cross-sectional estimates of equations (2) and (3) for 1984, 1985, 1987, 1988, and 1989. Magnitudes differ, but the qualitative result that foreign profits have 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 one.

[13] For example, Smith and Watts (1992) find firm size to be correlated with dividend payout rates, after controlling for other firm characteristics. The regression sample is chosen to include only those firms reporting foreign profits (and foreign taxes paid). If firms finance their foreign operations out of retained earnings, then the selection rule oversamples low-dividend firms, which may bias the estimates in the direction of *reducing* the apparent effect of foreign profits on domestic dividends. Table I indicates that firms with foreign profits have more assets and sales, and have smaller dividend/assets and dividend/sales ratios, than do firms without foreign profits. Hence the observed correlation of dividend payouts and foreign profits is unlikely to arise simply from size differences, or from the construction of the sample.

Table III

Size-Adjusted Dividend Payout Regression Equations

The dependent variable is common dividends paid in 1986. E is domestic after-tax profits and F^* is foreign after-tax profits minus the U.S. tax due upon repatriation. Columns 1–3 add firm size variables to the Ordinary Least Squares (OLS) regression specification reported in column 4 of Table II. Columns 4–6 add firm size variables and total profits ($E + F^*$) interacted with nine one-digit Standard Industrial Classification (SIC) industry dummies (not reported). Assets, sales, and common dividends are measured in millions of 1986 dollars; employment is thousands of employees at yearend 1986. Values in parentheses are White-corrected standard errors. The sample is COMPUSTAT firms reporting foreign and domestic profits and taxes in 1986.

	OLS	OLS	OLS	OLS	OLS	OLS
($E + F^*$) interacted with industry	No	No	No	Yes	Yes	Yes
E	0.1565	0.1935	0.1697			
	(0.0237)	(0.0227)	(0.0219)			
F^*	0.5120	0.6149	0.6517	0.3336	0.4140	0.4759
	(0.0462)	(0.0404)	(0.0343)	(0.0461)	(0.0452)	(0.0427)
Assets	0.0257			0.0310		
	(0.0038)			(0.0041)		
Sales		0.0053			0.0059	
		(0.0010)			(0.0011)	
Employment			0.7555			1.0456
			(0.1091)			(0.1190)
Adj. R^2	0.79	0.78	0.79	0.80	0.78	0.80
n	451	451	451	451	451	451

in equation (3). Alternatively, firms in industries, such as petroleum, that have relatively high ratios of foreign to domestic profits might pay dividends at high rates, due to industry-specific characteristics that could be unrelated to their foreign profitability.

There are two simple methods of controlling for aspects of firm heterogeneity not captured in equations (2) and (3). The first method is to allow profit coefficients to vary by industry, and to add measures of firm size (other than profits) to the right side. Then equation (2) becomes:

$$D_{it} = (E_{it} + \eta F^*_{it})\nu_k\psi_t + \delta S_{it} + \varepsilon_{it} \tag{4}$$

for firm i in industry k, in which ν_k is a parameter specific to firms in industry k, S_{it} is firm i's size as measured either by assets, sales, or employment, and δ is a parameter to be estimated.

It is useful first to gauge the effect of firm size variables without including industry-specific slope coefficients. The first three columns of Table III report estimates of equation (4) that impose the constraint that $\nu_k = \underline{\nu}$, $\forall k$, and are run on data for 1986. Firm size variables are positively correlated with dividend payouts, and their presence shrinks the estimated coefficients on F^*_{it} and E_{it}; nevertheless, there remain large and significant differences between the estimated effects of foreign and domestic profits on dividend payouts. In the

specification (reported in Column one) that produces the estimates that differ most from those reported in Column 4 of Table II, firms are estimated to pay dividends equal to 2.6 percent of their assets, 51.2 percent of their foreign after-tax profits, and 15.7 percent of their domestic after-tax profits.

One difficulty that arises in estimating equation (4) without the restriction that $\nu_k = \underline{\nu}$, $\forall k$, is that nonlinear methods are necessary due to the interaction of η and ν_k. Since this interaction is of less interest (and is less precisely estimated) than the parameter η itself, it is simplest to incorporate industry effects by estimating a transformed version of equation (4):

$$D_{it} = (E_{it} + F^*_{it})\nu_k\psi_t + (\eta - 1)\nu_k F^*_{it}\psi_t + \delta S_{it} + \varepsilon_{it} \tag{5}$$

and further transforming equation (5) to replace $(\eta - 1)\nu_k$ by $(\eta - 1)$. This transformation permits equation (5) to be estimated as a linear equation, at the cost of possibly biasing the resulting estimates of η. Under the null hypothesis that $\eta = 1$, the coefficient on the second term in equation (5) should be zero. Columns 4–6 of Table III present estimates of equation (5) in which nine one-digit Standard Industrial Classification (SIC) industry dummy variables are interacted with total profits. The estimated values of $(\eta - 1)\psi_t$ in these regressions almost exactly equal differences between the estimated coefficients on E_{it} and F^*_{it} in the corresponding equations reported in Columns 1–3, suggesting that industry differences do not explain the effect of foreign profits on dividend payouts.

The second method of controlling for firm heterogeneity uses 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 accommodated explicitly.

Suppose that equation (2) is modified to include time-invariant firm-specific effects:

$$D_{it} = \gamma_i + [E_{it} + \eta F^*_{it}]\psi_t + \varepsilon_{it} \tag{6}$$

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" profits would be reflected in γ_i. Firm-specific effects can be removed by subtracting both sides of equation (6) from their lagged values:

$$D_{it} - D_{i,t-1} = \beta_{1t}E_{it} + \beta_{2t}F^*_{it} + \beta_{3t}E_{it-1} + \beta_{4t}F^*_{it-1} + u_{it} \tag{7}$$

in which $\beta_{1t} = \psi_t$, $\beta_{2t} = \eta\psi_t$, $\beta_{3t} = -\psi_{t-1}$, $\beta_{4t} = -\eta\psi_{t-1}$, and $u_{it} = (\varepsilon_{it} - \varepsilon_{it-1})$. 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.

Table IV

Dividend Payout Regressions: Pooled Nonlinear First Differences

The dependent variable is year-to-year change in common dividends. Column 1 reports nonlinear least squares results over 1984–1989; column 2 restricts the sample period to 1986–1989. η is the estimated effect of foreign profits; $\eta = 1$ if foreign and domestic profits influence dividends equally. Year coefficients represent estimates of β_1 from equations of the form: $\Delta D_t = \beta_{1,t}(E_t + \eta F_t^*) - \beta_{1,t-1}(E_{t-1} + \eta F_{t-1}^*)$. Values in parentheses are asymptotic standard errors. The sample is COMPUSTAT firms reporting foreign and domestic profits and taxes continuously throughout the sample periods.

Year(s)	1984–1989	1986–1989
$\beta_{1,1984}$	0.00437	
	(0.00392)	
$\beta_{1,1985}$	0.02257	
	(0.00384)	
$\beta_{1,1986}$	0.04112	0.07208
	(0.00970)	(0.01125)
$\beta_{1,1987}$	0.06750	0.07795
	(0.00772)	(0.01028)
$\beta_{1,1988}$	0.07202	0.06869
	(0.00919)	(0.00988)
$\beta_{1,1989}$	0.16192	0.10577
	(0.01546)	(0.01711)
η	1.60013	4.07208
	(0.20491)	(0.85802)
firms	326	402
n	1630	1206

Column one of Table IV presents pooled nonlinear estimates of equation (7) over the time period 1984–1989. The year coefficients (the 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 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 IV. 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 equation (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

Table V

Dividend Payout Regression Equations, Lintner Model

The dependent variable is the first difference of annual common dividends ($D_{it} - D_{it-1}$). E is domestic after-tax profits and F^* is foreign after-tax profits minus the U.S. tax due upon repatriation. D_{it-1} is lagged dividends. Values in parentheses are White-corrected standard errors. The sample is COMPUSTAT firms reporting foreign and domestic profits and taxes.

Year(s)	1985	1986	1987	1988	1989
E	0.0253	0.1505	0.0915	0.1347	0.1193
	(0.0074)	(0.0642)	(0.0205)	(0.0465)	(0.0510)
F^*	−0.0135	0.4183	0.2990	0.2031	0.5245
	(0.0119)	(0.1841)	(0.2016)	(0.1083)	(0.1642)
D_{it-1}	0.0244	−0.5583	−0.4047	−0.4313	−0.6491
	(0.0153)	(0.2475)	(0.2316)	(0.2265)	(0.2168)
Adj. R^2	0.47	0.34	0.12	0.22	0.48
n	457	493	515	515	510

to tax and other changes). Then it is possible to estimate a Lintner-type model of the form:

$$\Delta D_{it} = \beta_{1t} E_{it} + \beta_{2t} F^*_{it} + \beta_{3t} D_{it-1} + \varepsilon_{it} \qquad (8)$$

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

Table V presents estimates of equation (8) for years 1985–1989. The equation in column one, with $(D_{1985}–D_{1984})$ on the left side, is poorly estimated, while the other years have coefficients that are reasonably consistent with earlier results. The estimated coefficient on foreign profits is uniformly greater than the coefficient on domestic profits, though standard errors are so large that the difference is statistically significant only for 1989. Inclusion of a constant term on the right side of equation (8) does not change any of the estimates appreciably, and the constants are generally insignificant.

Two difficulties arise in interpreting the results in Table V. 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 (8) was rerun with instrumental variables, instrumenting for lagged dividends with twice-lagged foreign and domestic profits (except for the 1985 equation, which uses 1984 profits). The results do not differ from the ordinary least squares (OLS) estimates.

The second difficulty in interpreting estimates of equation (8) 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 profits, then foreign profits will appear to generate dividends. The presence of a fixed effect can be corrected by first-differencing equation (8), although this procedure can run afoul of the usual problem of raising the noise level in the regression.

Table VI

Dividend Payout Regression Equations: Pooled Nonlinear Lintner Models

The dependent variable in columns 1 and 2 is the first difference of annual common dividends (D_{it}); the dependent variable in column 3 is the first difference of this first difference. η is the estimated effect of foreign profits; $\eta = 1$ if foreign and domestic profits influence dividends equally. The β_1s in columns 1 and 2 are estimated year coefficients and the β_3s estimated adjustment coefficients from equations of the form: $\Delta D_t = \beta_{1,t}(E_t + \eta F_t^*) + \beta_{3,t} D_t$. This equation is estimated in first differences in column 3. Values in parentheses are asymptotic standard errors. The sample is COMPUSTAT firms reporting foreign and domestic profits and taxes continuously throughout the sample periods.

Dependent Variable	$D_{it} - D_{it-1}$		$(D_{it} + D_{it-2} - 2D_{it-1})$
Year(s)	1985–1989	1986–1989	1986–1989
$\beta_{1,1985}$	0.0082		0.0151
	(0.0017)		(0.0096)
$\beta_{1,1986}$	−0.0034	0.1326	0.0301
	(0.0128)	(0.0125)	(0.0118)
$\beta_{1,1987}$	0.0968	0.1002	0.0461
	(0.0086)	(0.0083)	(0.0072)
$\beta_{1,1988}$	0.0694	0.0616	0.0555
	(0.0103)	(0.0085)	(0.0079)
$\beta_{1,1989}$	0.1766	0.1474	0.1527
	(0.0162)	(0.0134)	(0.0194)
$\beta_{3,1985}$	0.0253		−1.2587
	(0.0072)		(0.0650)
$\beta_{3,1986}$	0.0514	−0.6265	−1.2817
	(0.0504)	(0.0393)	(0.0681)
$\beta_{3,1987}$	−0.3921	−0.4842	−1.3550
	(0.0343)	(0.0356)	(0.0347)
$\beta_{3,1988}$	−0.3354	−0.3545	−1.3955
	(0.0461)	(0.0435)	(0.0354)
$\beta_{3,1989}$	−0.6837	−0.6996	−1.7864
	(0.0401)	(0.0385)	(0.0443)
η	2.9947	3.6943	4.0841
	(0.2856)	(0.3318)	(0.5606)
Firms	354	395	354
n	1770	1580	1420

Differencing equation (8) while maintaining year-specific slope coefficients and imposing that $\beta_{2t} = (1 + \eta)\beta_{1t}$, $\forall t$, yields:

$$(D_{it} + D_{it-2} - 2D_{it-1}) = \beta_{1t}(E_{it} + \eta F_{it}^*) + \beta_{3t} D_{it-1} - \beta_{1t-1}(E_{it-1} + \eta F_{it-1}^*) - \beta_{3t-1} D_{it-2} + \varepsilon_{it} - \varepsilon_{it-1} \quad (9)$$

Table VI presents estimates of equations (8) and (9), pooling the data over the whole sample period. The original model (8) 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 $\beta_{1,1986}$ and $\beta_{3,1986}$ 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 $\beta_{1,1986}$ and $\beta_{3,1986}$ change significantly when data for 1985 are included, which may reflect the poor fit of the 1985 equation reported in Column 1 of Table V.

Estimates of the differenced equation (9) are reported in Column 3 of Table VI. Here, too, the estimate of η (4.1) is significantly greater than one. The estimates of the β_3s are, however, significantly greater than one in absolute value, implying an explosive adjustment process in a Lintner framework. The same problem appears in estimates of equation (9) run on individual years. 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 profits stimulate dividend payments at greater rates than do domestic profits. 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 covering a broader time-span.

IV. Foreign Profits and Domestic Dividends: Time Series Evidence

The analysis in this section uses the time series variation in the ratio of foreign to domestic profits to specify and test a simple aggregate representation of the dividend process for U.S. firms. Time series data offer an opportunity to identify the effect of foreign profits in a way that avoids some of the limitations of the available cross sectional variation, since data are available for many more years, all U.S. corporations are included, and it is possible to identify the foreign countries in which U.S. firms earn profits.

In order to compare the parameters estimated from aggregate time series data to those estimated from firm-level panel data, it is helpful to construct an aggregate dividend model that is based on firm-level behavior. Linear functions are the simplest to aggregate. Returning to the firm-level model equation (2), with the constant term excluded,

$$D_{it} = (E_{it} + \eta F^*_{it})\psi_t \tag{10}$$

The advantage of equation (10) is that its form is unchanged by aggregation.

In order to estimate variants of equation (10) 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 profits is less optimistic than otherwise. Firms that target their dividends with permanent profits in mind might pay particular attention to the profitability of the corporate sector relative to the rest of

the economy, reasoning that this profitability ratio follows mean reversion. The following specification is consistent with such a picture:

$$\psi_t = [\phi_1 + \phi_2(E_t + \eta F_t^*)/\text{GNP}_t]^\gamma \tag{11}$$

in which E_t and F_t^* represent economy-wide aggregate domestic after-tax corporate profits and aggregate after-tax foreign profits, respectively; GNP_t is U.S. gross national product 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 equations (10) and (11):

$$D_{it} = (E_{it} + \eta F_{it}^*)[\phi_1 + \phi_2(E_t + \eta F_t^*)/\text{GNP}_t]^\gamma \tag{12}$$

Define π_t to be total after-tax profits, the sum of domestic after-tax profits and foreign after-tax profits ($\pi_t \equiv E_t + F_t^*$), and define D_t to equal aggregate corporate dividends paid in year t. Summing equation (12) over all firms i and normalizing by aggregate profits, π_t, yields:

$$D_t/\pi_t = [1 + (\eta - 1)F_t^*/\pi_t]\phi_1^\gamma[1 + \phi_2(E_t + \eta F_t^*)/(\phi_1 \text{ GNP}_t)]^\gamma \tag{13}$$

Define α_t to be the ratio of foreign after-tax profits to total after-tax profits ($\alpha_t \equiv F_t^*/\pi_t$). Assuming that the bracketed terms on the right side of equation (13) are both close to one, the logs of both sides of equation (13) can be approximated by a first-order Taylor series approximation:

$$\log(D_t/\pi_t) \approx (\eta - 1)\alpha_t + \gamma\log(\phi_1) + (\gamma\phi_2/\phi_1)E_t/\text{GNP}_t + (\gamma\phi_2/\phi_1)\eta F_t^*/\text{GNP}_t \tag{14}$$

Estimates of equation (14) reveal significant first-order autocorrelation in the residuals.[14] The corresponding first-difference specification is:

$$\Delta\log(D_t/\pi_t) = \beta_1\Delta\alpha_t + \beta_2\Delta E_t/\text{GNP}_t + \beta_3\Delta F_t^*/\text{GNP}_t \tag{15}$$

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 equation (15) is linear in parameters when run without imposing the restriction that $(\beta_1 + 1)\beta_2 = \beta_3$.

Column one of Table VII presents unconstrained estimates of equation (15), run on aggregate U.S. data covering the time period 1950–1986.[15] It is striking that the time series estimates of η reported in Table VII closely resemble the firm-level estimates reported in Tables II–VI. In the unconstrained version of

[14] The Durbin-Watson statistics in unconstrained estimates of equation (14) take 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 equation (15), its estimated coefficient equals 1.002. Estimating equation (14) in first differences appears to be the most reasonable strategy.

[15] The national income account data used in these regressions are described in Section I. In order to facilitate comparability between domestic and foreign earnings, corporate profits were used without the national income and product account inventory valuation and capital consumption adjustments. The time series regressions were rerun, adding the capital consumption adjustment to domestic profits, with results that were very close to those in the text.

Table VII

Aggregate U.S. Dividend Payout Regression Equations

The dependent variable is: $\Delta \ln(D_t/\pi_t)$, the annual change in the log of the ratio of dividends to total corporate profits for the U.S. economy. $\Delta\ \alpha_t$ is the annual change in the ratio of foreign to total (domestic plus foreign) profits for the U.S. corporate sector. The coefficient on $\Delta\alpha_t$ equals $(\eta - 1)$, in which η is the estimated effect of foreign profits; $\eta = 1$ if foreign and domestic profits influence dividends equally. $\Delta\ (E_t/\text{GNP}_t)$ is the change in the ratio of domestic corporate profits to the gross national product (GNP), and $\Delta\ (F_t/\text{GNP}_t)$ is the change in the ratio of foreign profits (of U.S. corporations) to U.S. GNP. $\Delta\ \theta_t$ is the change in the relative tax cost of paying dividends (defined so that low values of θ correspond to high costs of paying dividends), and Nixon is a dummy variable for the Nixon voluntary dividend controls between 1972–1974. Columns 1–3 present ordinary least squares regressions, while columns 4–6 present nonlinear least squares regressions. The equations reported in columns 4–6 restrict the coefficient on $\Delta\ (F_t/\text{GNP}_t)$ to equal the product of the coefficient on $\Delta\ (E_t/\text{GNP}_t)$ and one plus the coefficient on $\Delta\ \alpha_t$. Standard errors are in parentheses. The sample consists of annual observations between 1950–1986.

	OLS	OLS	OLS	NLS	NLS	NLS
$\Delta\ \alpha_t$	3.527	3.305	3.261	1.820	1.658	1.642
	(0.626)	(0.667)	(0.636)	(0.730)	(0.657)	(0.656)
$\Delta\ (E_t/\text{GNP}_t)$	−5.891	−6.519	−6.458	−13.211	−12.765	−12.600
	(1.724)	(1.841)	(1.756)	(1.433)	(1.310)	(1.325)
$\Delta\ (F_t/\text{GNP}_t)$	−88.772	−82.411	−78.237	****	****	****
	(11.065)	(12.834)	(12.409)			
$\Delta\ \theta_t$		0.584	0.763		1.833	1.845
		(0.596)	(0.576)		(0.631)	(0.633)
Nixon			−0.053			−0.034
			(0.026)			(0.039)
Adj. R^2	0.90	0.90	0.91	0.81	0.85	0.85
$D - W$	1.763	1.783	2.11			
n	36	36	36	36	36	36

the estimation, reported in Column one, there are two available estimates of η: $(\beta_1 + 1)$ 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 equation (15). Over the period 1950–1986, the tax cost (to shareholders) of receiving dividends changed relative to the tax cost of accruing capital gains; firms that maximize shareholder welfare might adjust their payouts in response to movements in this ratio. Denoting the relative tax price by θ, dividends are expected to respond positively to θ.[16] Suppose that the dividend equation takes the form:

$$D_{it} = (E_{it} + \eta F^*_{it})[\phi_1 + \phi_2(E_t + \eta F^*_t)/\text{GNP}_t]^\gamma\, e^{\mu\theta} \qquad (16)$$

[16] The tax cost parameter θ is taken from Poterba (1987); 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.

In this specification, the elasticity of dividend payouts to a change in θ equals $\mu\theta$. When transformed equation (16) can be estimated in the same fashion as equation (15), 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 expected 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.[17]

The simple linear specification of equation (15) 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 VII present nonlinear estimates that impose this restriction. While the estimated parameters change somewhat from the simple linear specification, the message is the same: foreign profits influence dividend behavior more strongly than do domestic profits. 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 VII can be generalized along a number of dimensions. When included, a constant term is always insignificant and does not affect any of the other estimated coefficients. The specification of equation (15) can be modified slightly by taking $\Delta \log(\pi_t)$ to the right side; the estimates in Table VII impose a unit coefficient on that term. When estimated in unconstrained form, the coefficients on $\Delta \log(\pi_t)$ lie between 0.84 and 0.86 and are not significantly different from one (although they are significantly different from zero), while the other estimated coefficients do not change significantly.

It is possible to expand the definition of dividend payouts to include distributions that arise through share repurchases or acquisitions. Table VIII reports the results of estimating the simple version of equation (15) over two time periods, 1950–1986 and 1950–1982, using three different definitions of dividend-like distributions.[18] When share repurchases and acquisitions are added to dividends, and the equation is estimated over the 1950–1986 time period, the estimated η is no longer significantly greater than one (in fact, in Column 3 of Table VIII, the point estimate of η is negative, although it is associated with a large standard error).

This change appears to reflect the impact of corporate distributions through expenditures for acquisitions in the 1980s. The specification reported in Column 2 of Table VIII, in which only share repurchases are added to dividends,

[17] 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 (1987) 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.

[18] Shoven (1987) and Bagwell and Shoven (1989) provide annual data on nondividend payments to shareholders.

Table VIII

Aggregate U.S. Corporate Distribution Regression Equations

The dependent variable is: $\Delta \ln(D_t/\pi_t)$, the annual change in the log of the ratio of corporate distributions to total corporate profits for the U.S. economy. $\Delta \alpha_t$ is the annual change in the ratio of foreign to total (domestic plus foreign) profits for the U.S. corporate sector. The coefficient on $\Delta\alpha_t$ equals $(\eta - 1)$, in which η is the estimated effect of foreign profits; $\eta = 1$ if foreign and domestic profits influence dividends equally. $\Delta (E_t/\text{GNP}_t)$ is the change in the ratio of domestic corporate profits to the gross national product (GNP), and $\Delta (F_t/\text{GNP}_t)$ is the change in the ratio of foreign profits (of U.S. corporations) to U.S. GNP. Corporate distributions consist only of common dividends for the purposes of the regressions reported in columns 1 and 4. The regressions reported in columns 2 and 5 add share buybacks to common dividends in defining corporate distributions, while the regressions reported in columns 3 and 6 add share buybacks and expenditures on acquisitions to common dividends in defining corporate distributions. Standard errors are in parentheses. The sample for the regressions in columns 1–3 consists of annual observations between 1950–1986; in columns 4–6 the sample period is limited to 1950–1982.

	Dependent Variable: $\Delta \ln(D_t/\pi_t)$; D_t defined as:					
	Dividends	Dividends + Share Rep.	Dividends + Share Rep. + Acquisitions	Dividends	Dividends + Share Rep.	Dividends + Share Rep. + Acquisitions
	Sample Period: 1950–1986			Sample Period: 1950–1982		
$\Delta \alpha_t$	3.527	1.585	−1.864	5.245	5.833	4.318
	(0.626)	(1.527)	(2.790)	(1.132)	(1.230)	(2.188)
$\Delta (E_t/\text{GNP}_t)$	−5.891	−9.113	−14.185	−3.393	−2.592	−4.479
	(1.724)	(4.202)	(7.679)	(2.207)	(2.534)	(4.265)
$\Delta (F_t/\text{GNP}_t)$	−88.772	−61.163	−2.558	−107.246	−113.009	−80.796
	(11.065)	(26.962)	(49.274)	(14.968)	(17.180)	(28.920)
Adj. R^2	0.90	0.54	0.15	0.90	0.88	0.63
$D - W$	1.763	1.681	1.683	1.831	1.470	1.683
n	36	36	36	32	32	32

produces an estimated effect of foreign profits that is stronger than the effect of domestic profits (though the difference is not statistically significant). Columns 4–6 of Table VIII report estimates of equation (15) that use expanded definitions of distributions and cover only the period 1950–1982; these estimates resemble the estimates reported in Table VII. Hence it appears that foreign profits influence dividends more strongly than they do acquisitions. These results are consistent with an explanation in which dividend payments are used to signal profits to a greater degree than are expenditures on acquisitions.

One version of the signaling story holds that the less information conveyed by reported profits, the more the market might require tangible signals of profitability. Table IX presents regressions in which foreign profits are distinguished by national origin. The column headers indicate the country, or group of countries, for which profits are distinguished from other foreign profits. Thus, in the first column of Table IX, $\Delta\alpha'$ measures the change in the ratio of Canadian to total (foreign plus domestic) profits, while $\Delta\underline{\alpha}$ is the change in the

Table IX

Aggregate U.S. Dividend Payout Regression Equations Distinguishing Foreign Locations

The dependent variable is $\Delta \ln(D_t/\pi_t)$, the annual change in the log of the ratio of dividends to total corporate profits for the U.S. economy. $\Delta \alpha_t'$ is the annual change in the ratio of foreign profits in the indicated country to total (domestic plus foreign) profits for the U.S. corporate sector. $\Delta \underline{\alpha}_t$ is the corresponding change in the ratio of profits in all *other* foreign countries to total (domestic plus foreign) profits for the U.S. corporate sector. The coefficient on $\Delta\alpha_t$ equals $(\eta - 1)$, in which η is the estimated effect of foreign profits; $\eta \doteq 1$ if foreign and domestic profits influence dividends equally. $\Delta (E_t/\text{GNP}_t)$ is the change in the ratio of domestic corporate profits to the gross national product (GNP). $\Delta (F_t'/\text{GNP}_t)$ is the change in the ratio of foreign profits of U.S. corporations in the indicated country to U.S. GNP; $\Delta (\underline{F}_t/\text{GNP}_t)$ is the corresponding change in the ratio of profits in all other foreign countries to U.S. GNP. Standard errors are in parentheses. English speaking countries include Australia, the Bahamas, Bermuda, Canada, Ireland, New Zealand, South Africa, and the United Kingdom. The sample consists of annual observations between 1950–1986.

Special Location:	Canada	Canada + United Kingdom	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)
$\Delta (E_t/\text{GNP}_t)$	−5.272	−6.658	−5.806	−3.378	−3.337
	(2.802)	(2.168)	(1.943)	(1.953)	(2.332)
$\Delta (F_t'/\text{GNP}_t)$	−130.416	−37.367	−88.273	−9.692	−167.630
	(123.731)	(66.125)	(38.906)	(31.722)	(43.959)
$\Delta (\underline{F}_t/\text{GNP}_t)$	−84.554	−106.611	−92.498	−169.717	−59.999
	(15.641)	(22.046)	(21.562)	(31.057)	(19.158)
Adj. R^2	0.89	0.89	0.89	0.91	0.90
$D - W$	1.768	1.830	1.700	1.660	1.652
n	36	36	36	36	36

ratio of non-Canadian foreign profits to total profits. Large estimated standard errors make the results generally inconclusive, except for the large dividend impact of profits earned in developing countries. This result is consistent with a signaling interpretation of dividends in which the market requires particularly strong verification of profits reported in developing countries.[19]

V. Implications

The firm-level and aggregate regression results suggest that U.S. corporations pay dividends out of their foreign profits at about three times the rate that they do out of their domestic profits. There are a number of reasons to have expected foreign profits to stimulate *fewer* dividends than domestic

[19] Alternative specifications produce similar results. Hines (1991b) reports regressions in which foreign exchange profits enter separately from other foreign profits, and in which there is little evidence that foreign exchange gains and losses influence dividend payouts. Hines (1991b) also reports specifications of a Lintner-type model fit to aggregate data, with results that are similar to the firm-level results reported in Table VI.

profits do. The tax cost of repatriating profits from low-taxed foreign locations gives many firms incentives to reinvest profits abroad rather than repatriate them, if attractive foreign investments can be found. Some foreign governments control tightly the abilities of multinationals to withdraw funds from their countries. And if foreign profits are viewed by home management as less reliable and therefore less permanent than domestic profits, they might be expected to stimulate fewer dividends than do domestic profits.

Nevertheless, it appears that the opposite is true. The need to signal profitability to investors may explain the impact of foreign profits on dividends, particularly if the market is skeptical of foreign profit reports. In addition, firm-level differences in the tax costs of repatriating foreign profits appear to influence dividend payments, as implied by signaling models such as Bernheim (1991).

There are other possible explanations for the effect of foreign profits 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,[20] 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 profits if bond covenants encumber foreign and domestic profits to different degrees, but there is little direct evidence that bond covenants have this feature.[21]

It is possible that U.S. firms systematically understate their foreign profits, either for tax or for regulatory reasons; if so, then the estimated coefficient on foreign profits might in part pick up the degree of understatement. There is evidence that U.S. firms adjust transfer prices to choose the location of their profits (within limits) to minimize their worldwide tax liabilities,[22] 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 U.S. firms to select the locations of their foreign operations, there may be an incentive to overstate foreign profits (in low-tax countries) at the expense of domestic profits.[23]

The effect of foreign profits on dividends is consistent with a "permanent income" model of dividends if changes in contemporaneous foreign profits are better predictors of changes in future profits than are changes in contemporaneous domestic profits.[24] In the "permanent earnings" dividend model of

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

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

[22] See, for example, Hines and Rice (1994).

[23] Harris et al. (1993) offer evidence of such behavior on the part of American multinationals.

[24] Little is known about the relative permanence of foreign and domestic profitability. Errunza and Senbet (1984) and Fatemi (1984) report evidence that markets value multinational operations

Marsh and Merton (1987), managers adjust their dividend payouts to changes in permanent earnings as reflected in stock price changes. The market may react very favorably to foreign earnings announcements, thereby raising the dividends of firms that maintain their ratios of dividends to share value.[25]

There may be an important tax consequence of the propensity of U.S. corporations to pay dividends at high rates out of their foreign profits. Individual income taxes paid by shareholders receiving dividends out of foreign profits may exceed direct corporate taxes on the same profits.

Table X presents estimates of the annual contributions of foreign profits to U.S. tax revenue through the corporate income tax and through individual taxes on dividend income.[26] The first two columns present annual corporate income tax revenue based on national income and product account data described in Section I. 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 percent) is attributable to foreign profits, even though the foreign fraction in 1986 was at its highest level for the 1950–1986 period.

Column 5 of Table X presents estimates of tax revenues from dividend taxes over the period 1950–1986, measured as total dividend payments by U.S. corporations to U.S. recipients multiplied by the effective tax rate on dividends received by domestic shareholders.[27] Columns 3 and 4 offer two interpretations of the contribution of *foreign* profits to this tax revenue from dividends. Column 3 presents calculations of the average effect of foreign profits on dividend tax revenue: its entries equal $\tau_{\text{div}} D_t\{\eta F_t^*/(E_t + \eta F_t^*)\}$, taking η to equal 2.82, its estimated value in Column 4 of Table VII. A comparison of Columns 3 and 1 of Table X reveals that tax revenue from dividends generated by foreign profits approximates the direct corporate tax revenue generated by those profits, and that the dividend tax revenue exceeds the corporate tax revenue in every year since 1976.

The estimated value of η used to calculate the entries in Column 3 of Table X comes from a nonlinear model (equation 12) of the relationship between aggregate dividends and aggregate profits. The *marginal* contribution of foreign profits 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

more than domestic operations, suggesting that foreign profits have greater permanence (or less risk). Doukas and Travlos (1988) and Morck and Yeung (1991) identify particular firm characteristics associated with market value generated by foreign operations. It is noteworthy that Bartov and Bodnar (1994) find exchange rate fluctuations to be uncorrelated with abnormal returns of affected firms.

[25] Note that this explanation carries the (untested) implication that current dividends associated with foreign profitability will predict future foreign profitability, and suggests that foreign acquisitions and divestitures will influence dividend payouts. It also suggests that foreign operations can contribute to a firm's short-term financial pressures.

[26] Note that these estimates do not include individual taxes on capital gains accruing to shareholders of corporations with undistributed foreign profits.

[27] 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 (1987).

Table X

U.S. Tax Revenue, Domestic and Foreign Sources

Columns 1 and 2 report estimated U.S. corporate tax revenue from the foreign and domestic profits of U.S. corporations, based on national income and product account information. Columns 3 and 4 report the estimated effect of foreign profits of U.S. corporations on U.S. tax collections from shareholder dividend taxes. The basis of these calculations is the $\eta = 2.82$ value reported in column 4 of Table VII. Column 5 presents estimates of annual U.S. shareholder dividend tax collections from all sources. Dollar amounts are billions of current dollars.

	Corporate Income Tax		Shareholder Dividend Tax		
Year	Foreign Profits	Domestic Profits	Foreign Profits (Average)	Foreign Profits (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

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 VII.[28] These entries are of the same order of magnitude as those in Columns 1 and 3, though they are generally smaller than those in Column 1. Consequently, both the marginal and average effects of foreign profits on domestic dividends imply that tax revenues from shareholder dividend taxes are of the same order of magnitude as corporate tax revenues generated by foreign profits.

VI. Conclusion

This article examines the impact of foreign profits on corporate dividend payouts, finding that foreign profits generate dividends at roughly three times the rate at which domestic profits generate dividends. This pattern appears in both cross-sectional and aggregate time series data, and appears to be robust to alternative specifications of the dividend payout process.

The proclivity of firms to pay dividends out of foreign profits carries three implications for the analysis of corporate financial policy. The first is that it strengthens the signaling interpretation of dividend payments, since firms may feel particularly strong needs to signal foreign profitability, and do so by paying dividends. The second, and related, implication is that the cost of capital for foreign operations may be higher than previously estimated, if firms feel obligated to make significant dividend payments out of foreign profits. The third implication is that the foreign profits of American multinationals generate significant U.S. tax revenue through the individual taxation of shareholder dividends, and that the magnitude of these individual tax collections rivals the tax revenue collected on foreign profits via the corporate tax.

The foreign profits of U.S. corporations are important for many reasons beyond the tax revenue they generate. Foreign operations are already responsible for a sizable fraction of U.S. 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 U.S. firms in domestic markets. Already some of the consequences are apparent in the dividend payout behavior of firms with foreign profits, and there may be other important effects on investment and financing decisions.

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[28] Since the parameter γ is never estimated directly, these calculations are based on the same logarithmic approximation used to derive equation (14). The numbers in Column 4 equal $\text{Div}_t\{1 - [E_t/(E_t + \eta F_t^*)]\exp(-\beta\eta F_t^*/\text{GNP}_t)\}$.

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