

The Impact of Taxes on Dividends and Corporate Financial Policy

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Abstract

The impact of taxes on dividends and corporate financial policy has been debated by scholars for decades. The 2003 tax reform (known as JGTRRA), which substantially lowered dividend tax rates for US investors, provides an important opportunity to test the relevant theories and to draw empirical lessons of relevance for tax policy. This paper reviews some of these lessons. First, the evidence shows a large and immediate positive response of dividends paid by US firms. This increase was concentrated among firms in which an influential constituency benefited from the tax cut. Stock prices rose for high-dividend firms relative to low-dividend firms, while the value of non-dividend paying firms also increased. These findings are in some cases difficult to reconcile with the existing theoretical models, but do strongly suggest that taxes have a significant impact on dividend payments. The paper also presents a simple model of international financial equilibrium to illustrate JGTRRA’s incentives for US investors to hold more equity, and discusses the evidence on this issue. Finally, it is argued that increasing international financial integration undermines the effectiveness of JGTRRA’s shareholder-level dividend exclusion as a means of influencing US firms’ behavior. Future progress in this direction should perhaps rely instead on a firm-level dividend deduction or reductions in the corporate tax rate.

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1) Introduction

The impact of taxes on dividends and corporate financial policy has been debated by scholars for decades. The current decade has provided an important opportunity to test the various theories that have been proposed in this area, and to draw empirical lessons of relevance for tax policy. In 2003, the taxation of dividend income was transformed when Congress passed the Jobs and Growth Tax Relief Reconciliation Act (hereafter JGTRRA). This reform reduced the dividend tax rate from a maximum of 38.6% (for taxpayers in the highest bracket before 2003) to a maximum of 15%. The tax relief provided by JGTRRA applied to dividends paid by all US firms and to dividends from most – but, importantly, not all - foreign corporations. This paper reviews some of the major lessons that scholars have drawn from studying the impact of the 2003 tax reform. The focus is on both dividend policy and financial policy (with the latter interpreted broadly to encompass US investors' preference for holding equity versus debt). The framework used here emphasizes the integrated nature of global financial markets in the 2000's, and envisages JGTRRA as a reform that changed the personal tax regime facing a subset of the world's investors – namely, those resident in the US.

Two main types of consequences of JGTRRA are explored. First, US stockholders would be expected to have become more inclined to receive equity returns in the form of dividends. This would apply to US stockholders in both US and foreign firms, but it is of course only in the former that US shareholders are likely to be a large and influential constituency in determining payout policy. Thus, the empirical literature has focused on the dividend behavior of US firms in the aftermath of JGTRRA (e.g. Blouin, Raedy and Shackelford, 2004, 2007; Chetty and Saez, 2005; Brown, Liang and Weisbenner, 2007). The main conclusion is that there was a large and immediate positive response of dividends paid by US firms, especially in the form of new dividend initiations, after JGTRRA. While there are many potential alternative explanations, Chetty and Saez (2005) argue strongly for a causal impact of the tax reform. Moreover, the increase in dividends was concentrated among firms in which an influential constituency benefited from the tax cut, highlighting the possible influence of agency issues in determining firms' responses to the tax reform (Chetty and Saez, 2007). In addition, the literature has examined the impact of JGTRRA on stock prices and firm value, using a variety of approaches (Auerbach and Hassett, 2006, 2007; Dhaliwal, Krull and Li, 2007; Amromin, Harrison and

Sharpe, 2006). The main lesson drawn is that stock prices rose for high-dividend firms relative to low-dividend firms, as might be expected. However, the value of non-dividend paying firms also rose, a finding that is more unexpected.

The second type of consequence is that by reducing the taxation of equity returns JGTRRA can be expected to increase US investors' preference for holding equity rather than debt. This conclusion is illustrated within a simple framework that extends Miller's (1977) theory of financial equilibrium to an international setting. In this model, JGTRRA induces US investors to hold more equity, but has no systematic effect on US firms' propensity to issue equity rather than debt. While it is difficult to test for these portfolio effects, Desai and Dharmapala (2007) exploit a relatively obscure feature of JGTRRA – its restriction of the favorable tax rate on foreign dividends to those countries that have signed tax treaties with the US – to find evidence consistent with an increase in US investors' equity holdings in foreign countries that enjoyed favorable dividend tax treatment under the act.

The overall findings of this literature are in some cases difficult to reconcile with the theoretical models that scholars have brought to the debate (e.g. the “old” and “new” views of dividend taxation that are described in Section 2). However, they do strongly suggest that taxes have a significant impact on dividends and financial policy. Some questions about the efficiency consequences of JGTRRA remain to be fully answered; for instance, the temporary nature of JGTRRA (with the tax cuts being currently scheduled to expire in 2010) and the fact that the tax cut was deficit-financed complicate the analysis of the long-term consequences. However, there can be little doubt that it has had a substantial effect on the policies of US firms and on the behavior of US investors at home and abroad, underscoring the important role of taxation in determining these choices.

JGTRRA was intended by its proponents as an important step forward in the integration of corporate and personal taxes. Scholars have long argued for corporate tax integration as a means of reducing the distortions – to organizational form, payout policy, and financing decisions – created by the “double taxation” of corporate income (e.g. Hubbard, 1993, 2005). The paper ends with some reflections on two related questions: whether the dividend tax regime created by JGTRRA should be extended, and how further advances towards corporate tax

integration may best be pursued in the future. It is argued that the increasing degree of international financial integration that has characterized the 2000's tends to reduce the effectiveness of JGTRRA's shareholder-level (partial) dividend exclusion mechanism as a means of achieving corporate tax integration. Instead, an alternative approach of allowing firms a tax deduction for dividend payments may be more effective in this environment in influencing firm policies on payout and capital structure. The latter can also be directly influenced by reductions in the corporate tax rate, a policy that has been increasingly widely advocated on a variety of grounds (e.g. Viard, 2008).

The paper proceeds as follows. Section 2 discusses the lessons of JGTRRA regarding dividends, payout policy and firm value. Section 3 develops a simple model of international financial equilibrium, and discusses the evidence on US investors' portfolio responses to JGTRRA. Section 4 draws out some implications of the experience with JGTRRA for policies to achieve corporate tax integration, while Section 5 concludes.

2) Lessons about Dividends, Payout Policy, and Firm Value

The primary questions addressed by the literature on JGTRRA center on how the reform affected the propensity of US firms to pay dividends, how the change in this propensity affected total levels of payout, and how the reform influenced firm valuation. The discussion of these findings below begins with a simple equilibrium condition that serves as a framework for characterizing the various theories that have guided researchers in this area. It also provides some insights into how the relevant variables would respond to a reform such as JGTRRA. Then, the empirical literature on payout and valuation is discussed, and the lessons that flow from this research are summarized.

2.1) A Simple Equilibrium Condition

Consider a taxable investor who faces a dividend tax rate of $t_d \in (0, 1)$ and holds stock in a firm while also holding another asset such as a bond.¹ Let the (fixed) after-tax return to the investor from the bond be r^+ . Suppose that the firm's pretax rate of return is r , and assume that both the corporate and the capital gains tax rates are zero.² The firm pays out a fraction $d \in (0, 1)$ of the returns to the shareholder as dividends (with the remaining fraction $(1 - d)$ being received in the form of (tax-exempt) capital gains). Let $u(dr)$ be an increasing, concave function of the dividend returns paid by the firm, and let γ and α be nonnegative parameters. Then, assuming that both the stock and the alternative asset are riskless, the following condition must be satisfied if the investor holds the firm's stock:

$$\gamma u(dr) + r(1 - \alpha dt_d) = r^+ \quad (1)$$

The tax penalty traditionally imposed on dividends relative to capital gains (triggered whenever when the firm sets $d > 0$) is offset here by $u(dr)$, which represents in reduced form any of a variety of benefits that have been hypothesized to be derived by shareholders from the payment of cash dividends.

Equation (1) nests several of the major theoretical approaches that have been used in the analysis of dividend taxation. Most straightforwardly, Miller and Scholes (1978) argue that the marginal investor will generally be tax-exempt. This can be represented by imposing the restrictions $\gamma = \alpha = 0$, so that $r = r^+$. In this view, the firm's pretax return (and hence its share price) as well as its dividend policy are independent of t_d ; JGTRRA would thus affect neither the firm's dividend policy nor its valuation. As discussed below, perhaps the clearest and least contentious conclusion to emerge from the analysis of the effects of JGTRRA is that this tax irrelevance theory is contradicted by the evidence.

¹ In the Miller (1977) model discussed in Section 3, for example, t_d would be the dividend tax rate faced by the marginal investor who is indifferent between equity and bonds. However, no such restrictions are imposed at this stage. The discussion here and that in Section 3 both rely on the "marginal investor" approach to market equilibrium. An alternative approach would be to use a framework such as the after-tax capital asset pricing model (CAPM) developed by Brennan (1970). In this approach, the market equilibrium is influenced by all investors, with each investor's influence being weighted by her wealth and risk tolerance; see also Auerbach and King (1983).

² Equivalently, r could be interpreted as the after-corporate-tax (but before-personal-tax) rate of return.

The “new view” of dividend taxation (Auerbach, 1979; Bradford, 1981; King, 1977), on the other hand, is premised on the assumption that shareholders are burdened by the existence of dividend taxes. Moreover, this burden is assumed to be inescapable, as all payout must take the form of dividends at some point in time.³ Even when the firm retains current earnings for reinvestment, dividend taxes are not avoided; rather, the returns generated by that investment are haunted by the specter of future dividend taxes. As is well known, these assumptions imply that when retained earnings are the marginal source of funds for investment, firms’ investment decisions are unaffected by dividend taxes. In terms of Equation (1), the new view can be represented by setting $\gamma = 0$ and $\alpha = (1/d)$, so that:

$$r = \frac{r^+}{1 - t_d} \quad (2)$$

The dividend tax is capitalized into the firm’s value, regardless of whether *this particular firm* pays dividends or not. Under the new view, a reduction in t_d would lead to a reduction in the firm’s required pretax return r (i.e. to an increase in the firm’s share price). However, as d is determined as a residual after the firm has exhausted its investment opportunities, which are independent of t_d , there should be no change in d . As discussed below, however, this applies only to a permanent change in t_d ; a temporary reduction makes dividend payout today less costly in tax terms than future payout, and would be expected to lead to an increase in d .

The new view is often contrasted with what is termed the “old view” of dividend taxation (implicit in Feldstein (1970) and described in Poterba and Summers (1985)). The old view imposes fewer restrictions on Equation (1), and can be represented by setting $\gamma > 0$ and $\alpha = 1$. It assumes that firms have the option of paying returns to shareholders in the form of dividends or capital gains, but that there exists some reason why the firm must pay dividends despite the tax penalty. Under this assumption, the firm’s *own* dividend yield d becomes relevant to its valuation (unlike in the new view): the pretax return the firm must pay its shareholders is increasing in d

³ For this reason, the new view is also sometimes referred to as the “trapped equity” view. The argument that dividend taxes are unavoidable is supported, for example, by the existence of US tax rules (e.g. Section 302) that potentially subject share repurchases to the higher dividend tax rate if repurchases are undertaken with sufficient regularity. However, repurchases by US firms have grown substantially in recent decades without triggering these tax provisions.

(holding fixed the benefits from dividends). It follows that a reduction in t_d would reduce the firm's cost of capital and so induce it to increase its level of investment (again in contrast to the new view).

The old view *per se* does not provide a theory of why dividend payments are necessary or desirable from the point of view of shareholders. However, financial economists have developed a variety of theories to explain what Black (1976) terms the “dividend puzzle” – i.e. why firms pay dividends despite the tax penalty:⁴ One influential theory (originating with Bhattacharya (1979)) is that managers can use dividends to signal private information about future firm performance to investors. In some formulations of the signaling theory, it is precisely the tax penalty associated with dividends that enables them to serve as a credible signal: firms with better future prospects are able to “burn money” through dividends to an extent that firms with less rosy prospects cannot emulate. Another widely-discussed theory (Jensen, 1986) is premised on the idea that the retention of earnings creates the temptation for managers to use this free cash flow for purposes (such as unprofitable investments) that do not enhance shareholder value. The payment of dividends can thus avert these agency problems by returning cash to shareholders. The monitoring theory (Allen, Bernardo and Welch, 2000) starts with the observation that much investment in the stock market occurs through institutions (such as pension funds) that are tax-exempt or tax-favored, and that institutions also generally have greater capacity to monitor managers than do individual shareholders. Thus, the payment of dividends can drive away individual investors and attract a clientele of institutions, who provide “monitoring services” that raise the value of the firm.⁵

None of these theories are entirely compelling. For instance, even if managers have private information about future performance, the signaling theory gives rise to another puzzle – namely, why a less costly method of signaling has not been devised. Similarly, the free cash flow theory *per se* does not explain why firms cannot disgorge cash to shareholders through

⁴ The new view does not address this puzzle, as it assumes that dividend taxes are unavoidable in the long run.

⁵ Other theories have been developed within the behavioral finance literature: for instance, Baker and Wurgler (2004) argue that investor sentiment tends to favor dividend-paying firms at certain times, inducing managers to cater to this sentiment by paying dividends.

repurchases rather than dividends. In other words, Black's (1976) "dividend puzzle" continues to serve as a source of puzzlement. In Equation (1), any or all of the theories described above are represented in reduced form by $u(dr)$; it should be stressed, though, that this is merely a "black-box" approach that reflects our ignorance of the precise factors at work.

Without necessarily imposing any of the restrictions discussed above, Equation (1) can be used to straightforwardly derive some likely consequences of JGTRRA. The tax reform disturbed the initial equilibrium by reducing t_d . Equation (1) suggests two possible channels through which equilibrium can be restored: an increase in d and/or a decrease in r . Implicit differentiation of Equation (1) suggests that reducing t_d results in an increase in d , as long as the initial t_d is sufficiently large relative to the marginal utility of dividend returns. A reduction in t_d also leads to a decrease in the required pretax return r ; in the short run, this would be manifested in the form of an increase in the firm's share price. Moreover, the valuation response to JGTRRA is predicted to be increasing in the firm's initial dividend yield d (subject to the same condition imposed earlier that the initial t_d is "sufficiently large"). The rest of this section discusses the empirical evidence on both these questions.

2.2) The Effects of JGTRRA on Dividends

As noted above, Equation (1) suggests that reducing t_d results in an increase in d . Indeed, evidence that JGTRRA was followed by a large increase in dividend payout began to emerge soon after the enactment of the legislation. In particular, Blouin, Raedy and Shackelford (2004) compare the payout policies of a sample of firms that declared dividends in the six months following the enactment of JGTRRA with those of a control group of firms that declared dividends during the corresponding period in 2002. They find that firms substantially increased both their regular and special dividend payments following JGTRRA. They do not, however, find that this effect is stronger for firms that have more individual ownership. Consequently, they are cautious about attributing causality to the tax reform.

Chetty and Saez (2005) also analyze this question, using a large sample of firms over the period from 1980 to the second quarter of 2004. They, too, find a large increase in dividends following JGTRRA, but distinguish between increases along the intensive margin (i.e. increases in the amount paid by firms that previously paid dividends) and the extensive margins (i.e.

dividend initiations by firms that were previously nonpayers). They find a particularly large effect in the latter case, with a substantial increase in initiations after the reform. To address the issue of causality, they develop an identification strategy that involves using a control group of firms with nontaxable institutions as the largest shareholder.⁶ The idea behind their strategy is that if the surge in dividends was caused by the tax cut, it should only be observed among firms with taxable shareholders. On the other hand, other possible explanations, such as changes in the corporate governance environment or the general economic climate, would apply to all firms, including those with large nontaxable ownership. Chetty and Saez (2005) find that there is indeed no increase in dividends for the control group, which suggests a causal role for JGTRRA in increasing dividends.

The dividend increase after JGTRRA was large in magnitude – amounting to a 20% increase in payments (Chetty and Saez, 2005) – but its efficiency consequences depend, in large measure, on whether total payout increased as well. For instance, under the agency theory (Jensen, 1986) JGTRRA would have beneficial consequences only to the extent that it encouraged managers to disgorge more cash to shareholders. If the observed growth in dividends merely represented a substitution from share repurchases to dividends – a change in the *form* of payout – then more cash in aggregate would not be paid out. Researchers have vigorously debated the question of whether total payout increased as a result of JGTRRA. Brown, Liang and Weisbenner (2007) find that among those firms that initiated dividends following JGTRRA, about one third did not increase total payout. As this is a substantially larger fraction than was true in years prior to 2003, they view this as evidence of substitution among those firms that initiated dividends in the wake of JGTRRA. Blouin, Raedy and Shackelford (2007) point out that dividend initiators in 2003 paid only a small fraction of aggregate dividends. They find evidence of substitution between dividends and repurchases – in particular, an increase in the fraction of payout firms paid in the form of dividends after JGTRRA – in a broader sample of firms. Moreover, the extent of this substitution is increasing in the fraction of individual ownership in

⁶ Empirically identifying nontaxable institutions in itself poses a considerable challenge, as the standard data source (Thomson's Financial database, which reports institutional ownership based on 13-F filings) does not classify institutions by tax status. Chetty and Saez (2005) thus hand-classify institutions (based on their names) into categories subject to different tax treatment.

the firm; this is interpreted by the authors as evidence that the change was caused by the reform, rather than reflecting a general trend towards dividend payment over time. On the other hand, Chetty and Saez (2005, 2006) argue that the time series pattern of share repurchases is too volatile to support any robust inference about substitution. However, they do find that for the subsample of firms that initiated dividends after JGTRRA, the amount of share repurchases increased as well, casting some doubt on the substitution hypothesis.

Equation (1) suggests that the magnitude of the increase in d in response to JGTRRA should be larger the smaller is γ . A small γ would be expected, for instance, when there is more shareholder monitoring of management or better alignment of managerial incentives (so that, for example, the disgorgement of free cash flow is less important to shareholders). Indeed, Chetty and Saez (2005) find that the increase in dividends was concentrated among firms where managers owned substantial amounts of stock, among firms where taxable institutions are large shareholders, and among those where a large independent shareholder served on the board of directors. However, an incentive-alignment story cannot necessarily account for all of the evidence. For instance, Brown, Liang and Weisbenner (2007) find that dividend increases were concentrated among firms which had managers with relatively large stock holdings. In contrast, managers with large amounts of unexercised stock options (which are typically not dividend-protected) did not change their behavior in response to JGTRRA. This suggests that in addition to the strength of incentive alignment, the self-interest of managers played a role in how they responded to JGTRRA. This evidence has led Chetty and Saez (2007) to develop an agency theory of managers' responses to the tax reform, as discussed below.

2.3) The Effects of JGTRRA on Firm Value

Equation (1) suggests that equilibrium can be restored following JGTRRA through a decrease in the firm's pretax return r (as well as by increases in d). In other words, the reduction of the tax penalty for dividends implies that shareholders can now be compensated less for holding stock in a dividend-paying firm. This would be manifested in the short term in the form of an increase in the share price. Equation (1) also predicts that the valuation response to

JGTRRA is increasing in the firm's initial dividend yield d . The empirical literature has found results broadly consistent with both these predictions.⁷

Auerbach and Hassett (2007) identify significant event dates during the period from December 2002 to May 2003 as the President's initial proposal was announced and made its way through Congress. The vicissitudes undergone by the proposal provide an abundance of opportunities for using an event-study approach to measure market reactions to changes in the probability of the dividend tax cut's enactment. Auerbach and Hassett (2007) analyze abnormal returns for subsets of firms that may be expected to be differentially affected by the reform. They find that news events indicating a higher probability of enactment were associated with higher abnormal returns (relative to the market) for firms with higher dividend yields. Dhaliwal, Krull and Li (2007) find a similar result using an alternative approach that relies on analysts' earnings forecasts – obtained from the I/B/E/S database - to construct a measure of the *ex ante* rate of return demanded by equity investors. They find that following JGTRRA the implied cost of equity capital for high dividend yield firms decreased relative to that for low dividend-yield firms.

Both these results apply only within the subsample of firms that pay dividends. For non-dividend-paying firms, Auerbach and Hassett (2007) and Dhaliwal, Krull and Li (2007) both find a positive reaction (using the different approaches outlined above). Dhaliwal, Krull and Li (2007) view the larger decrease in the implied cost of equity capital for nonpayers than for dividend-paying firms as an anomaly that is inconsistent with current theories. Auerbach and Hassett (2007), however, argue that a larger effect for nonpayers is consistent with the new view. For these firms, their entire stream of dividend payments lies in the future, and so (as long as the tax cut is of sufficiently long duration) all of these future dividends will benefit from the lower

⁷ Another aspect of valuation that has been examined by researchers is the impact of JGTRRA on ex-dividend day price behavior. This term refers to the change in the price of a stock at the time a dividend is paid. This price change reveals how much investors value the dividend, and in particular provides evidence on whether dividend taxes are incorporated into their valuation. Elton and Gruber (1970) find that the price falls by less than the amount of the dividend, suggesting the capitalization of dividend taxes. Chetty, Rosenberg and Saez (2007) find that this magnitude of this phenomenon changed in 2003 in a manner consistent with JGTRRA's reduction of dividend taxes. However, they also show that this inference is not robust because of the long-run time series volatility in ex-dividend day price behavior.

rate. Thus, these firms should benefit even more than do firms that currently pay high dividends. In support of this view, they also report a similar finding for firms that are predicted to issue new shares in the future. In contrast, Amromin, Harrison and Sharpe (2006) argue that the positive abnormal returns for non-dividend-paying stock were unrelated to the tax reform, and were also, for instance, found also among non-dividend-paying UK stocks over this period. However, Auerbach and Hassett (2006) find that the magnitude of the abnormal returns for nonpayers was positively related to the predicted probability of issuing new shares, suggesting that the effect was indeed related to JGTRRA.

The event study approach of Auerbach and Hassett (2007) does not address the overall market reaction to JGTRRA, as the market return is used as the control. Dhaliwal, Krull and Li (2007) find an overall decrease in the implied cost of equity capital for US firms. Their approach, however, requires that investors' risk preferences did not change over the period studied. Amromin, Harrison and Sharpe (2006) use European stock markets (and real estate investment trusts (REITs), which are subject to distinctive tax treatment) as controls, and find no aggregate impact of JGTRRA on the US stock market. However, Auerbach and Hassett (2006) point out that this approach is not sufficiently precise to discern a positive reaction of the magnitude that might be expected, such as the 6% increase in market value predicted by Poterba (2004).

2.4) Summary

The scholarly literature suggests that JGTRRA led to a substantial and rapid increase in dividends. This increase was concentrated among firms where managers or influential shareholders were directly affected by the reform. There is evidence of an increase in the value of firms with higher dividend yields, but also of an even larger increase in the value of non-dividend-paying firms. This picture, in its entirety, is difficult to reconcile with any of the existing theories outlined above. The new view can explain the increase in dividends if the tax cut was expected to be temporary,⁸ while the increase in the value of firms is of course consistent with the new view (see Equation (2)). However, explaining the increase in the value of non-

⁸ Note that, if the dividend tax cut was expected to be temporary, the new view implies that the increase in dividends was inefficient, in that it occurred because firms eschewed efficient investment projects in order to pay dividends during the temporary period of low tax rates (Bank, 2007; Dharmapala, 2007; see also Korinek and Stiglitz, 2008).

dividend-paying firms in the manner proposed by Auerbach and Hassett (2007) requires that the tax cut is of longer duration. The old view *per se* does not explain dividend payment, so it is difficult to determine whether the dividend response is consistent with this theory. However, a central contention of the old view is that a reduction in dividend taxes leads to higher investment. This will eventually be reflected in higher dividends, but not with the immediacy of the observed response to JGTRRA (Chetty and Saez, 2007).

Inspired by the evidence on the importance of agency issues in firms' responses to JGTRRA, Chetty and Saez (2007) construct a model in which managers can invest in a "pet project" that does not generate benefits for shareholders; they can also pay dividends or invest in profitable projects. Because of the existence of this pet project, combined with imperfect alignment of interests between managers and shareholders, managers will pay lower dividends than shareholders would wish. A dividend tax cut raises the cost to managers of investing in their pet project – or more precisely reduces the tax penalty associated with paying out dividends – and so induces an immediate increase in dividend payments. This model provides a unified explanation for many of the responses to JGTRRA that researchers have found.⁹ Consistent with this model, Chetty and Saez (2006) find some evidence that JGTRRA led to a reallocation of funds from firms with lower growth prospects (measured using analysts' forecasts, as reported in the I/B/E/S database) to those with greater investment opportunities. If there was indeed a positive efficiency impact of JGTRRA, it is most likely to have occurred through this reshuffling of funds: the increase in dividend payments would have enabled investors to reinvest in firms that issue new shares to finance profitable investment opportunities. This is likely to enhance efficiency to the extent that the retained earnings in more mature firms would have been used for lower-value projects or simply consumed as managerial rents.

⁹ However, there are certain possibilities it does not encompass, such as a signaling value for dividends, or circumstances in which managers are so intent on enjoying leisure that they forego profitable investment opportunities and pay excessively high dividends. Chetty and Saez (2007) is also an example of a growing literature analyzing the linkages between taxation and corporate governance (e.g. Desai and Dharmapala, 2006, 2008a), as surveyed in Desai and Dharmapala (2008b). Bank (2007), however, cautions against using the tax code to achieve corporate governance objectives.

3) Lessons about Corporate Financial Policy and Portfolio Choices

The basic aim of this section is to analyze the consequences of JGTRRA for corporate financial policy and the portfolio choices of US investors (with a particular focus on their preference for debt versus equity). These consequences are illustrated using a simple framework that extends the model of financial equilibrium introduced by Miller (1977), although the formulation below is closer to the version in Auerbach (2002, pp. 1271-1273)) and Desai, Dharmapala and Fung (2007, pp. 351-354). As will be obvious, this model presents a highly simplified view of the world.¹⁰ Nonetheless, it provides some important insights, which are used to derive predictions about the effects of JGTRRA. Then, some relevant empirical evidence is discussed.

3.1) International Financial Equilibrium

As is well-known, the corporate tax system creates a preference for debt financing, as interest payments are tax-deductible to the corporation while returns paid to equityholders are not. In a setting where firms endogenously issue both equity and bonds, Miller (1977) argues that this tax advantage of debt is offset for some investors by a personal tax preference for equity returns because of the lower personal tax rate on the latter. Miller (1977) uses this insight to characterize an equilibrium in which each firm is indifferent about its debt-equity ratio; investors sort into clienteles for stocks and bonds according to their personal tax characteristics. The Miller model assumes a closed economy, but it has been extended to the international context by Hodder and Senbet (1990), some of whose central insights are used in the model below.

Assume that there are two countries: the United States (denoted US) and a foreign country (denoted F). Firms in this model are assumed to have an exogenously fixed country of residence (although they may operate abroad through a subsidiary, as discussed below). They face a residence-based corporate tax on their worldwide income of $\tau^{US} \in (0, 1)$ if resident in the US and $\tau^F \in (0, 1)$ if resident in F; their foreign operations face a source-based tax imposed by the host country, with a (limited) foreign tax credit allowed by their home country. Without loss

¹⁰ See Auerbach and King (1983) for a model of financial equilibrium that incorporates uncertainty about asset returns.

of generality (and in deference to current realities) it is assumed that $\tau^{US} > \tau^F$.¹¹ Firms can issue two kinds of assets: bonds and stock. Firms pay interest on the bonds they issue, and pay equity returns in the form of dividends and/or capital gains (the distinction does not matter for the purposes of this model). There is no risk associated with the returns from either bonds or equity.

There exists a continuum of investors in each country. These investors are distinguished by their personal tax rate t . US investors face tax rates in the interval $[0, t^{USmax}]$ and investors resident in F face tax rates in the interval $[0, t^{Fmax}]$. For concreteness, it is assumed that $t^{Fmax} > t^{USmax}$; this is not, however, crucial to any of the results. Both t^{Fmax} and t^{USmax} are assumed to be sufficiently large that some investors in each country wish to hold equity.¹² Investors are assumed to face only residence-based personal taxes. They are also restricted to holding nonnegative amounts of the two kinds of assets – corporate bonds and equity – issued by firms. The returns from these assets differ in their tax treatment at the personal level, with equity returns being taxed more lightly. Specifically, it is assumed that a US investor with personal tax rate t faces a tax rate of t on interest income and a tax rate of $e^{US}t$ on equity returns, while an investor with personal tax rate t resident in F faces a tax rate of t on interest income and a tax rate of $e^F t$ on equity returns; e^{US} and e^F are country-specific parameters in the interval $[0, 1]$. For concreteness, it is assumed that $e^F > e^{US}$; this is not, however, crucial to any of the results.

In Miller's (1977) equilibrium, the pretax returns on bonds and stock adjust to equate the return to equity and the net-of-tax interest rate (see also Auerbach, 2002, p. 1271). Given this, it is possible to define a parameter $\theta(t)$ that captures the degree of preference of investors for bonds relative to equity. Specifically, $\theta(t)$ is the ratio of the after-personal-tax value of \$1 of interest income to the after-personal-tax value of \$1 of equity income. For US investors:

¹¹ In practice, these assumptions mean that a firm resident in F faces a tax rate of τ^F on its domestic operations and a tax rate of τ^{US} on its US operations, while a firm resident in the US faces a tax rate of τ^{US} on both its domestic and foreign operations. Note that these corporate taxes are assumed to offer full deductibility of losses, as in Miller (1977).

¹² A minimal necessary condition for the Miller equilibrium is that the maximum personal tax rate exceeds the corporate rate. It is much less clear that this is the case today in the US than when Miller (1977) proposed his theory. However, even today (when the maximum Federal tax rate of 35% equals the corporate rate) incorporating state taxes into the analysis may result in some investors facing a personal tax rate on interest income that exceeds the corporate rate. Also, nontax considerations are ignored here, but subtracting the nontax cost of debt (e.g. a bankruptcy cost) from the expression for the tax advantage of debt will also result in some investors preferring equity.

$$\theta^{US}(t) \equiv \frac{1-t}{1-e^{US}t} \quad (3)$$

and for investors in F:

$$\theta^F(t) \equiv \frac{1-t}{1-e^F t} \quad (4)$$

The smaller is θ , the greater is the investor's tax preference for equity. As $\theta^{US'}(t) < 0$ and $\theta^F'(t) < 0$, the personal tax preference for bonds decreases with an investor's tax rate.

A firm's corporate tax preference for debt depends on the corporate tax rate at which it is able to deduct interest payments. For US firms, this rate will always be τ^{US} regardless of whether the interest payments are made by the parent or by a subsidiary in country F. For firms resident in F, however, there is an incentive to deduct interest payments in the US rather than in F (see Hodder and Senbet (1990)). This can be accomplished through a variety of strategies that involve transferring interest deductions to a US subsidiary.¹³ Thus, all firms will have a corporate tax preference for debt that is given by $(1 - \tau^{US})$.

The corporate tax preference for debt and investors' personal tax preference for equity are depicted graphically in Figure 1. To characterize the financial equilibrium shown in Figure 1, attention is restricted to cases where each country's investors hold assets issued in both countries. Let r^{US} be the pretax return to equity issued by US firms, and let r^F be the pretax return to equity issued by F firms. Similarly, let i^{US} be the pretax return to equity issued by US firms,

¹³ For example, suppose that an F corporation needs \$100 of loans to finance a new factory in country F; assume the factory will generate a return of \$15 and that the interest rate demanded by lenders is 10%. Instead of issuing bonds itself, the F corporation could set up a subsidiary in the US, which would then borrow \$100 and use the proceeds to repurchase stock owned by the parent. The parent then invests in the factory and generates the \$15 return; it uses \$10 of that return to infuse new equity into the US subsidiary, which the latter uses to pay interest on the bonds. These interest payments are thus deducted at the higher US tax rate τ^{US} (recall that the corporate tax is assumed to treat losses symmetrically). In practice, such strategies are restricted by "thin capitalization" rules (such as Section 162(j) of the US tax code). However, Desai, Foley and Hines (2004) find evidence consistent with multinational corporations locating debt in higher-tax countries.

and let i^F be the pretax return to equity issued by F firms. If US investors facing some sufficiently high personal tax rate t hold both US and F equities, then it must be the case that:¹⁴

$$r^F(1 - \tau^F)(1 - e^{US}t) = r^{US}(1 - \tau^{US})(1 - e^{US}t) \quad (5)$$

and hence that:

$$r^F(1 - \tau^F) = r^{US}(1 - \tau^{US}) = r^* \quad (6)$$

where r^* is the world after-corporate-tax return to equity. That is, returns after corporate taxes are equated across US and F firms.¹⁵ If US investors with sufficiently low t hold both US and F bonds, then $i^F(1 - t) = i^{US}(1 - t)$, and hence $i^F = i^{US} = i^*$: i.e. the interest rates offered by US and F firms are equated at i^* .

In Figure 1, equilibrium requires that the personal tax preference for equity (given by θ^{US} and θ^F) equals the corporate tax preference for debt (given by $(1 - \tau^{US})$). US investors facing the personal tax rate t^{US*} are indifferent between holding bonds issued in either country and equity issued by firms in either country; thus:

$$i^*(1 - t^{US*}) = r^*(1 - e^{US}t^{US*}) \quad (7)$$

(and an analogous condition holds for F investors facing the personal tax rate t^{F*}). Hence:

$$\frac{r^*}{i^*} = \frac{1 - t^{US*}}{1 - e^{US}t^{US*}} = \theta^{US}(t^{US*}) = \frac{1 - t^{F*}}{1 - e^F t^{F*}} = \theta^F(t^{F*}) = 1 - \tau^{US} \quad (8)$$

so that:

$$i^*(1 - \tau^{US}) = r^* \quad (9)$$

¹⁴ Given the existence of source-based corporate taxation, it might be thought that firms resident in F would face a corporate tax rate that is some weighted average of τ^F and τ^{US} (as they face the US tax rate on their US operations). It is implicitly assumed in Equation (5) that F firms are able to source their (positive) income solely in F, just as they were earlier assumed to be able to source all interest deductions in the US. The basic conclusions are unaffected, however, if F firms face a weighted average of τ^F and τ^{US} .

¹⁵ This condition is similar, for example, to that in Devereux (2000). Note that the pretax return does not reflect shareholder-level taxes. This situation is thus a little different from some of the theories of dividend taxation discussed in Section 2; however, this difference does not matter for the questions addressed in this section.

The left-hand side represents the cost of borrowing to a firm (whether located in the US or F), taking into account the subsidy provided by the (US) corporate tax, while the right-hand side represents the rate of return demanded by equityholders. Thus, each firm is indifferent about its debt-equity ratio in this international financial equilibrium. All US investors with personal tax rates above t^{US*} and all F investors with personal tax rates above t^F* hold stock. All US investors with personal tax rates below t^{US*} and all F investors with personal tax rates below t^F* hold bonds. In each case, the national origin of the assets owned by each investor is indeterminate. Firms issue a sufficient number of bonds to satisfy the demand of investors who prefer bonds and a sufficient amount of equity to satisfy the demand of investors who prefer equity. Thus, there is a determinate debt-equity ratio at the *global* level; however, as each firm is indifferent about its capital structure, the aggregate debt-equity ratio at the *national* level is indeterminate.

3.2) The Effect of JGTRRA on US Investors' Equity Holdings

JGTRRA can be viewed as having disturbed the international financial equilibrium characterized above by reducing the parameter e^{US} , thereby increasing the tax preference for equity among US investors. This is depicted in Figure 1 as a shift of $\theta^{US}(t)$ to $\theta^{US+}(t)$; clearly, the new equilibrium involves a larger fraction of US investors wishing to hold stock. This entails that firms issue more equity and that the *global* debt-equity ratio falls. However, there is no necessary presumption in this model that the firms issuing the additional equity are US firms: the increased demand for equity by US investors could be satisfied (in theory, entirely) by F firms. The capital structure of US firms is indeterminate in both the old and the new equilibria, and so within this framework there is no basis for predicting that JGTRRA would reduce US firms' use of debt, as was suggested by some proponents of the reform.

Obviously, if US investors are highly home-biased, then the reduction in the global debt-equity ratio will surely be concentrated among US firms. There is indeed considerable evidence of home bias in US equity holdings. Figure 2 depicts the location of US equity holdings in 2004, computed from the Treasury International Capital (TIC) system dataset.¹⁶ The TIC system

¹⁶ The TIC data are available at www.treas.gov/tic/ and are described in more detail in Bertaut, Grier and Tryon (2006) and Desai and Dharmapala (2007). Following Cai and Warnock (2006, p. 33), the approach here is to compute US investors' aggregate holdings as US market capitalization minus foreigners' holdings of US equities plus US investors' foreign equity holdings (all of which are obtained from TIC).

reports the portfolio holdings of foreign securities by US investors and the portfolio holdings of US securities by foreign residents. It is based on periodic surveys of banks, other financial institutions, securities brokers and dealers. The holdings are divided into equity foreign portfolio investment (hereafter FPI) and debt FPI, with the latter category further subdivided into long-term and short-term debt. While there are some limitations of the TIC data, it nonetheless represents the best available source of information on inbound and outbound US FPI. As shown in Figure 1, the TIC data indicates that most portfolio equity investment by US investors – 88% – is located in the US.

However, this is not necessarily the most relevant information in this context. JGTRRA induced US investors to hold more equity, so what matters more is whether these *incremental* holdings of equity are in US or foreign stocks; it is the location of these incremental holdings that determines how much less debt US firms issue. The home bias of US investors has clearly eroded over time. Figure 3 depicts the location of the *increase* in equity holdings by US investors from 2004 to 2005 (in each case, the data is for December 31 of the relevant year). Specifically, what Figure 3 reports is the percentage of this increase – 43% – that was accounted for by increased holdings of foreign equity. This suggests that any increase in US investors’ desire for equity as a result of JGTRRA would have been met in substantial measure by the acquisition of stock in foreign rather than US corporations.

Thus, it seems reasonable to conclude that the main discernible effect of JGTRRA is likely to be on US investors’ portfolio choices. To be sure, there is likely to be some impact on the global debt-equity ratio, but it would be difficult to separate out the effects on this variable of factors other than JGTRRA that changed in 2003. Astronomers have not yet succeeded in measuring the debt-equity ratio on the planet Mars, so there is no readily identifiable control for the global debt-equity ratio. Thus, the main focus here is on changes in US investors’ portfolios. However, it is difficult to test this prediction using domestic (US) holdings, due to possible supply-side responses by US firms (in terms of the types of assets that they issue). In addition, the very existence of a home bias suggests that US investment in US firms may reflect different forces than does US investment in foreign firms. There is of course no other “home” country for US investors that can be used to control for these potential differences.

These considerations suggest that a more promising approach would be to compare US investment across different foreign countries. Indeed, a relatively obscure provision of JGTRRA relating to the treatment of foreign dividends provides a source of identification for just such an approach (Desai and Dharmapala, 2007). The lower tax rate for dividends under JGTRRA applies only to dividends paid by “qualified” foreign corporations. A foreign corporation is deemed to be “qualified” for this purpose if it satisfies at least one of three tests established by the legislation. Of these, the most relevant is the “Treaty Test,”¹⁷ which establishes that a corporation resident in a country with which the United States has a tax treaty meeting certain criteria qualifies for the lower dividend tax rate. In October, 2003, the IRS released a list of 52 countries that were deemed to satisfy the “Treaty Test”;¹⁸ these countries (listed in Table 1) are referred to below as “treaty” countries, while all those excluded from the list are referred to as “nontreaty” countries.

Qualification provides the US shareholders of foreign corporations with a substantially lower tax rate – for a top-bracket US shareholder, dividends from a British firm are taxed at 15%, while dividends from an Argentine firm are taxed at 35%. Desai and Dharmapala (2007) use this difference in tax rates to analyze the sensitivity of portfolio choices to dividend taxation, finding a substantial effect. This same source of variation can be used to shed some light on the predictions of the simple model presented above. In particular, if country F is a treaty country, then the reduced dividend tax applies, and US investors will wish to increase their equity holdings in both US firms and F firms, relative to holdings of debt. On the other hand, if F is a nontreaty country, then there is no reduction in dividend taxes for F firms, and so while US investors will want to increase equity holdings in US firms, there is no incentive to do so in F

¹⁷ In addition, under the “Possessions Test,” corporations resident in a US possession (such as Puerto Rico), or certain former US territories that are treated as possessions for tax purposes, automatically qualify. Under the “Market Test,” dividends from corporations whose shares are traded in the US are also eligible for the favorable dividend tax treatment.

¹⁸ See IRS Notice 2003-69 (“United States Income Tax Treaties That Meet the Requirements of Section 1(h)(11)(C)(i)(II”). Desai and Dharmapala (2007) calculate that these 52 countries together hosted to 82% of US outbound equity FPI holdings in 2001. Thus, most US portfolio investment is subject to the favorable tax regime under JGTRRA. Nonetheless, firms located in some significant destinations for US investment – such as Argentina, Brazil, Hong Kong, Malaysia, Singapore, and Taiwan – do not qualify for this favorable treatment.

firms.¹⁹ Thus, if US investors responded to JGTRRA's incentives to switch from debt to equity holdings, then this effect should appear only in treaty countries. Thus, it might be expected that the equity-to-debt ratio for US investment in treaty countries would rise, relative to the corresponding ratio for nontreaty countries.

Figure 4 shows how the ratio of equity to debt in US portfolio holdings changed after JGTRRA in treaty and nontreaty countries. The equity-to-debt ratio for treaty countries is computed by aggregating US investors' equity holdings across treaty countries, and dividing by US investors' debt holdings in the same group of countries. An analogous procedure is used for the equity-to-debt ratio in nontreaty countries.²⁰ The comparison is between 2001 (the last year prior to the reform for which TIC data is available) and 2004. The equity-to-debt ratio in treaty countries remained essentially unchanged over this period, apparently contradicting the theoretical prediction. However, using nontreaty countries as a control group suggests a different picture. In particular, the equity-to-debt ratio for nontreaty countries fell sharply over this period, so that (as expected) the equity-to-debt ratio for US investment in treaty countries rose, relative to the corresponding ratio for nontreaty countries.²¹

A more rigorous test along these lines is presented in Desai and Dharmapala (2007), although the primary emphasis of that paper is on the location of equity FPI across countries, rather than the mix of equity and debt. Desai and Dharmapala (2007) undertake a difference-in-difference analysis using panel data on US equity FPI, comparing investment in treaty and nontreaty countries before and after JGTRRA. Column 5 of Table 3 reports results controlling for debt FPI (and so essentially captures the effect on the equity-to-debt ratio); this also controls

¹⁹ JGTRRA reduced the top marginal rate on ordinary income from 38.6% to 35%, but this affects interest income and dividends from nontreaty countries symmetrically.

²⁰ In particular, note that these ratios are *not* obtained by averaging equity-to-debt ratios across countries. Thus, the weight placed on countries where there is little US investment is very small.

²¹ This could represent a reallocation of equity investment from nontreaty to treaty countries. Up to a point, that would not be inconsistent with the story being told here, but it may have been the case that this reallocation occurred without any net increase in foreign equity holdings. This seems unlikely, given the trend towards higher levels of investment abroad over this period (see Figure 3), but is difficult to test as there is no good control for the overall level of US equity FPI.

for other relevant factors such as changes in GDP, changes in market capitalization and changes in a stock market returns index. US equity FPI in treaty countries (relative to nontreaty countries) rose after JGTRRA, implying that the equity-to-debt ratio would also have risen correspondingly.

The overall lesson is that JGTRRA appears to have induced US investors to hold more equity. On the other hand, the effects of JGTRRA on the capital structure of US firms is not clear on theoretical grounds. Moreover, there does not appear to be any empirical evidence on this issue. Possibly, this is because all US firms were subject to JGTRRA, and so it is difficult to find a valid control group.

4) Lessons about Corporate Tax Integration

JGTRRA was intended by its proponents as an important step forward in the integration of corporate and personal taxes. Scholars have long argued for corporate tax integration (hereafter CTI) as a means of reducing the distortions – to organizational form, payout policy, and financing decisions – created by the “double taxation” of corporate income (e.g. Hubbard, 1993, 2005). This section begins by comparing JGTRRA’s approach to CTI with the dividend imputation systems that have commonly been used in other countries. Then, some international dimensions of CTI are discussed. The section ends with some reflections on two related questions: whether the dividend tax regime created by JGTRRA should be extended, and how further advances towards CTI may best be pursued in the future.

There are several different mechanisms through which CTI may be implemented. Treating corporations as pass-through entities is clearly impractical, so discussions of CTI have focused on three other policy tools (e.g. Hubbard, 1993, 2005): dividend imputation credits, dividend deduction at the firm level, and (full or partial) dividend exclusion at the shareholder level. Traditionally, the first of these has been the dominant approach, especially in Europe. Under an imputation system, shareholders receive a credit for corporate taxes paid at the firm level; this credit can be used to offset shareholders’ personal tax liability on their dividend income. Imputation credits, however, are typically restricted to corporate taxes paid by domestic

firms, resulting in a lower tax rate on domestic equity returns than on foreign equity returns. This creates a tax incentive to invest in domestic rather than foreign corporations, potentially causing inefficient under-diversification among domestic investors (e.g. Fuest and Huber, 2001; Avi-Yonah, 2005). From an individual investor's point of view, it may be rational to accept a higher level of risk by concentrating on domestic equities in order to obtain the higher expected after-tax return on those domestic securities. However, from society's point of view, the tax payments are (to a first approximation) simply a transfer. Thus, society as a whole ends up with a welfare loss by bearing more risk than necessary for the expected returns obtained. This implies that while CTI ameliorates domestic distortions, it creates new inefficiencies in international portfolio choices. Desai and Dharmapala (2007) find a large elasticity of equity FPI with respect to dividend taxes, comparing US FPI in treaty and nontreaty countries after JGTRRA. Thus, an important lesson from investors' response to JGTRRA is that tax-induced international portfolio distortions may be substantial in magnitude.

In the 2000's, international diversification issues have become more important than ever. At the same time, the dividend imputation systems of Europe have encountered legal problems, running afoul of the European Union's nondiscrimination principles (e.g. Graetz and Warren, 2007). As a result, there has been a movement away from dividend imputation towards shareholder-level dividend exclusion.²² JGTRRA's partial shareholder-level dividend exclusion can be viewed as part of this worldwide trend. As a mechanism for CTI in a globalized economy, JGTRRA's approach appears to be superior to a dividend imputation system. Most importantly, it does not restrict its partial dividend exclusion to dividends paid by US firms.²³ However, as discussed above, JGTRRA does not treat all foreign countries identically. Admittedly, most US equity FPI is subject to the favorable tax regime under JGTRRA. Nonetheless, dividends from firms located in some significant destinations for US investment – such as Argentina, Brazil, Hong Kong, Malaysia, Singapore, and Taiwan – do not qualify for this favorable treatment.

²² For example, the German tax reform of 2001 abandoned dividend imputation in favor of partial dividend exclusion (Fuest and Huber, 2001).

²³ However, the original proposal for a full dividend exclusion by President Bush in January, 2003 only applied to US corporations' dividends, and so would have created a very substantial bias against foreign equities, and hence a potentially very large welfare loss – see Avi-Yonah (2005).

The various justifications offered for JGTRRA's distinction between treaty and nontreaty countries are not entirely persuasive. In the legislative discussion surrounding the act, concern was expressed about extending the benefits of JTRRA to income on which no corporate tax had ever been paid (Sheppard, 2004). However, the distinction that JGTRRA draws between treaty and nontreaty countries does not have any necessary relationship to the corporate tax rate imposed in those countries. The focus on information exchange in defining which treaties are eligible for "qualification" may reflect fears about tax avoidance strategies or about tax evasion, but these concerns have never been described in detail. Moreover, concerns about the exchange of information are perhaps best addressed through the tax information exchange agreements (TIEA's) that the US has signed with many countries, including some with which it does not have tax treaties. However, JGTRRA uses treaty status rather than the presence of TIEA's as the basis for its applicability. Thus, while JGTRRA's treatment of foreign dividends is clearly preferable to that of most dividend imputation systems (and of the President's original proposal), it nonetheless distorts the location of FPI in an arbitrary manner that may create significant welfare losses.²⁴

While the effects of CTI on international portfolio diversification are widely appreciated, the model in Section 3 suggests another dimension to the interaction between global financial integration and CTI. In particular, there is a growing disjuncture between two different effects of CTI: influencing the portfolio choices of investors resident in the US versus influencing the behavior of firms resident in the US. In a closed economy, these two effects are intrinsically linked, as the number and types of securities issued by domestic firms must meet the demands of domestic investors. Obviously, however, this link is severed in an open economy, and policymakers pursuing CTI must choose among the different approaches to implementing CTI based on their ultimate objectives. This point can be illustrated using the model in Section 3. As already discussed, dividend exclusion – a reduction in e^{US} – induces US investors to hold more equity, but has no necessary impact on US firms' capital structure. On the other hand, allowing firms a deduction for dividends paid out to shareholders will result in a new equilibrium in which (assuming all equity returns are paid out as dividends) US firms issue only equity, while US

²⁴ Another possible reason for this distinction – that Congress wished to provide researchers with a "natural experiment" – can safely be dismissed.

investors' preferences are unchanged (though of course those who previously held US debt must now switch to foreign debt).²⁵

While this outcome is extreme, it illustrates that firm-level dividend deduction and shareholder-level dividend exclusion have very different consequences in an open economy. In particular, it highlights the potential inefficiency of using a dividend exclusion to influence firm behavior. While JGTRRA apparently achieved the aim of inducing US firms to pay more dividends, its efficacy in doing so was blunted by some degree of "leakage." The typical US shareholder benefiting from the tax cut held about a tenth of her portfolio overseas, and the revenue loss from the lower tax rate on foreign (treaty country) dividends is not compensated by any payout policy changes by US firms. This dissipation is much larger in the case of the impact of JGTRRA on US firms' capital structure. As Figure 3 suggests, nearly half of the increase in demand for equities by US investors would be expected to be satisfied by foreign firms. Thus, the impact on US firms' capital structure is likely to be only about half what it would be in a closed economy. This is not, of course, to argue that the tax cut should not have been extended to foreign dividends; that would obviously have created potentially large portfolio location distortions. Rather, the point is that in a globalized economy, there are constraints on what governments can accomplish, and the achievement of CTI is no exception to this rule.

On the other hand, if policymakers are primarily interested in influencing the portfolio holdings of US investors, rather than the behavior of US firms, then shareholder-level dividend exclusion involves no such dissipation of effort. In terms of the model in Section 3, there is no particular efficiency gain to changing the mix of debt and equity in that US investors hold, but it is possible to imagine circumstances in which doing so may be desirable. For instance, if stock market participation is viewed as being inefficiently (and perhaps irrationally) low, then there may be some potential justification for government policy to promote equity holdings (see Desai, Dharmapala and Fung (2007) for a discussion). However, the political rhetoric surrounding JGTRRA did not focus on these types of issues.

²⁵ Strictly speaking, this new equilibrium requires that there is not a substantial number of investors in either country for whom $t = 0$; otherwise, US firms may still issue a limited amount of debt to satisfy part of the demand of these investors. Also, it is assumed that firms resident in F are unable to avail themselves of the US dividend deduction – having already located all their debt in the US (see footnote 13), they cannot also locate all their equity there.

The higher costs of achieving CTI raise several questions about future policy. The first is the impending issue of whether the dividend tax cuts (scheduled for expiration in 2010) should be extended. If they are not, then it is unlikely that the increases in dividends in the wake of JGTRRA would be reversed; firms are loath to reduce regular dividend payments. However, there would then be reduced pressure on managers of firms that do not currently pay dividends to do so in the future. This would slow down the efficient reallocation of investment funds that Chetty and Saez (2006, 2007) argue was spurred by JGTRRA. In any event, as JGTRRA achieved only a partial implementation of CTI, there is scope for further progress towards this goal, regardless of whether the tax cuts are extended or allowed to lapse.

One policy option that goes beyond merely extending the tax cuts would be to further reduce dividend taxes, perhaps moving to full dividend exclusion. There are of course many budgetary and distributional concerns that are relevant to this decision. One factor that has not attracted much attention, however, is the impact on international portfolio choices. Seeking to reduce the dividend tax cut below 15% collides with an important constraint: the withholding tax rates imposed by foreign countries on dividends paid to US shareholders. Typically, this rate is 15% for treaty countries, though some treaties reduce it to 10% or less.²⁶ If the US dividend tax rate were lowered to zero, this would (for the most part) only apply in practice to US investors' domestic stock holdings. For example, consider a US investor who owns stock in the US and France. If the US dividend tax rate were zero, the dividends she receives from her US stock would be tax-exempt, but she would pay a 15% withholding tax to France. Moreover, she would not have a US tax liability on the French dividends against which to claim a foreign tax credit.²⁷ This would obviously severely discourage international diversification, with potentially large efficiency losses.

Of course, tax treaties could be renegotiated, perhaps to eliminate withholding taxes altogether. However, as treaty provisions are typically reciprocal, this would entail an additional

²⁶ Wacker (2004, Table 1) details the withholding tax rates specified in the tax treaties to which the US is a signatory.

²⁷ This problem would be mitigated, at least in part, if the taxpayer had other foreign-source income (such as interest) that was subject to US taxation.

revenue cost to the US (from eliminating withholding taxes imposed by the US on dividends paid by US firms to foreign shareholders), in addition to the direct revenue loss from reducing dividend taxes on US residents. Thus, it seems inadvisable to pursue further dividend tax cuts, especially as there are other ways to achieve CTI.

More generally, if the aim of CTI is to reduce distortions to US firms' payout and capital structure decisions, then (as argued above) dividend exclusion for US investors may be a poorly-targeted means to that end. This leaves the alternative of using a firm-level dividend deduction. This would encourage dividend payments²⁸ and would also treat debt and equity symmetrically at the firm level. Traditionally, policymakers have resisted offering a firm-level dividend deduction because it would allegedly benefit foreign shareholders, and because of what are believed to be its relatively large revenue costs (Avi-Yonah, 2005; Hubbard, 1993; 2005). However, in a world such as that represented in the model in Section 3, the pretax return to US firms' equity would adjust to take account of the lower effective corporate tax burden. Foreign shareholders would thus continue to earn r^* (before personal taxes) in the new equilibrium, and would not reap any "benefits" from the dividend deduction. Of course, they may benefit from an increase in the firm's share price at the time of the (unanticipated) announcement of the new policy. However, opposing dividend deduction on this basis would be akin to arguing that a US firm should not introduce a profitable new product because part of the gain in its share value would benefit foreign shareholders.²⁹

It was argued above that in current circumstances, a dividend deduction may be a more effective means of implementing CTI than is a dividend exclusion. Even when they are equally effective, growing global integration of financial markets tilts the balance increasingly towards the former in terms of the revenue costs. To illustrate this, suppose that US investors own a

²⁸ An alternative policy that would encourage dividends is an additional tax on undistributed profits, of the type briefly introduced in the US in the 1930's (Christie and Nanda, 1994). However, this would increase the overall corporate tax burden at a time when the US already has one of the highest corporate tax rates in the OECD.

²⁹ Note that the recirculation of funds to firms with better investment projects – argued by Chetty and Saez (2006, 2007) to be the primary efficiency benefit of JGTRRA – can be accomplished by the payment of dividends to foreign as well as domestic shareholders. Of course, foreign investors may be home-biased, but foreign shareholders of US firms are, by definition, those who have overcome home bias.

fraction $\mu < 1$ of stock in US firms (with foreign investors owning the rest) and also own some foreign stock, from which they receive dividends of D_F . US shareholders face a dividend tax rate of t_d on both US and foreign dividends and a zero capital gains tax rate, while US firms face a corporate tax rate of τ . Imagine that two different reforms – a (full) shareholder-level dividend exclusion and a (full) firm-level dividend deduction – would both have the same effect on US firms’ dividend payments, raising the total paid out from D_P prior to the reform to D_R after the reform. Then, the dividend deduction is less costly in revenue terms if the following condition holds:³⁰

$$t_d[\mu D_P + D_F] > \tau D_R - t_d [\mu(D_R - D_P)] \quad (10)$$

Equation (10) could be satisfied if, for instance, D_F is relatively large and t_d is sufficiently large relative to τ .³¹

If the primary aim of CTI is to influence US firms’ capital structure rather than their payout policy, then there is also another alternative policy that is very attractive. This is to reduce the corporate tax rate, thereby reducing the tax advantage of debt at the firm level. Of course, this policy is likely to have many other beneficial consequences as well, and has been increasingly advocated in recent years on a variety of grounds (e.g. Viard, 2008). For instance, the US corporate tax rate is widely viewed as being out of step with foreign rates, and there is growing evidence that the burden of the tax falls to a substantial degree on workers. In addition to all of this, of course, reducing the corporate tax rate would obviously alleviate the double taxation of corporate income, and thus enhance the efficiency of firms’ choices of organizational form and capital structure.

³⁰ The left-hand-side is the revenue loss from a dividend exclusion, and represents the revenue currently collected on all dividends received by US shareholders. The right-hand-side represents the revenue loss from the dividend deduction, adjusted for the increased dividend tax revenues obtained from US investors when US firms increase their dividend payments.

³¹ The relevant t_d should be weighted across investors by their stock holdings. Prior to JGTRRA, the top Federal marginal rate on dividends was 38.6%, and the relevant t_d may not have been much smaller, given the concentration of dividend income among higher-income taxpayers, and the fact that these taxpayers are typically ineligible for tax-favored savings vehicles.

5) Conclusion

The 2003 tax reform provided scholars with an unusual opportunity to analyze the impact of a large reduction in dividend taxes. A number of important lessons for tax policy can be distilled from this episode. The fall in dividend taxes led to a substantial and immediate increase in dividend payments by US firms, especially in the form of dividend initiations. These dividend increases were concentrated among firms with influential shareholders or managers who benefited from the reform. JGTRRA also increased the value of firms with high dividend yields relative to firms with lower yields, while also raising the value of firms that had yet to pay any dividends. The reform also appears to have changed US investors' preferences for equity over debt. However, in an increasingly financially integrated world, there is no clear basis for expecting much change in US firms' capital structure.

This combination of outcomes is difficult to reconcile with any one theoretical perspective on dividend taxation, and so should stimulate further thought on this issue. There are also important lessons for policy regarding the integration of corporate and personal taxes. In particular, it appears that JGTRRA's shareholder-level approach may be less effective in a financially integrated world economy than would measures – such as dividend deduction or corporate tax rate reductions - directed at US firms. Many of the longer-term consequences of the reform are still unclear, especially given the ostensibly temporary nature of the tax cut. For instance, any effect on investment would be very difficult to detect, given its long-run time series volatility (Chetty and Saez, 2005, p. 829). Finally, it is worth bearing in mind the wider budgetary context. JGTRRA instituted a deficit-financed dividend tax cut, and so certain aspects of its impact may differ from that of a revenue-neutral measure.

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Figure 1: International Financial Equilibrium

Tax preference

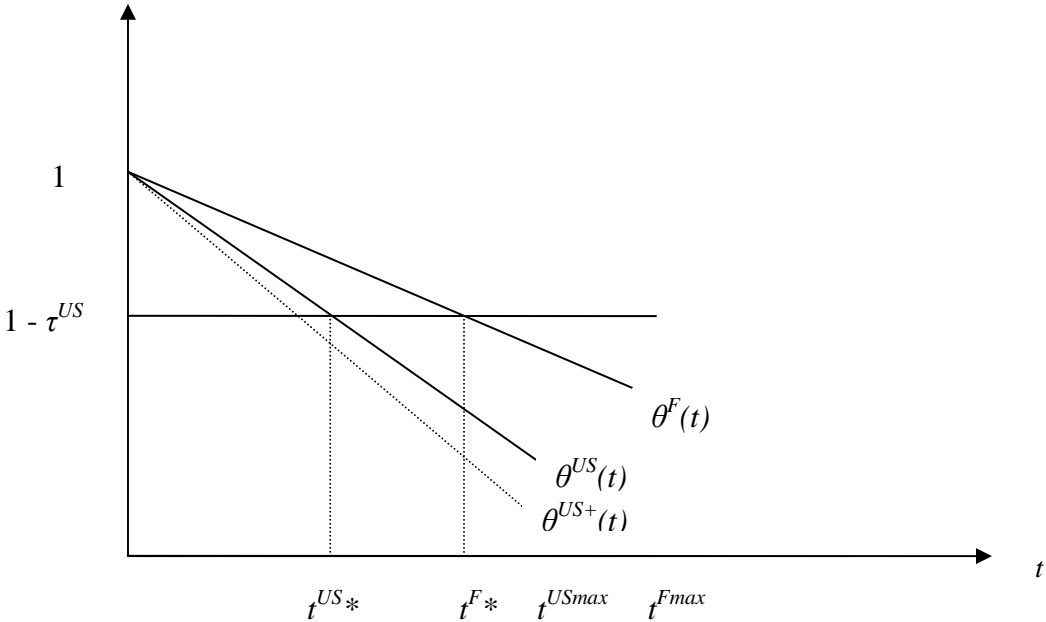
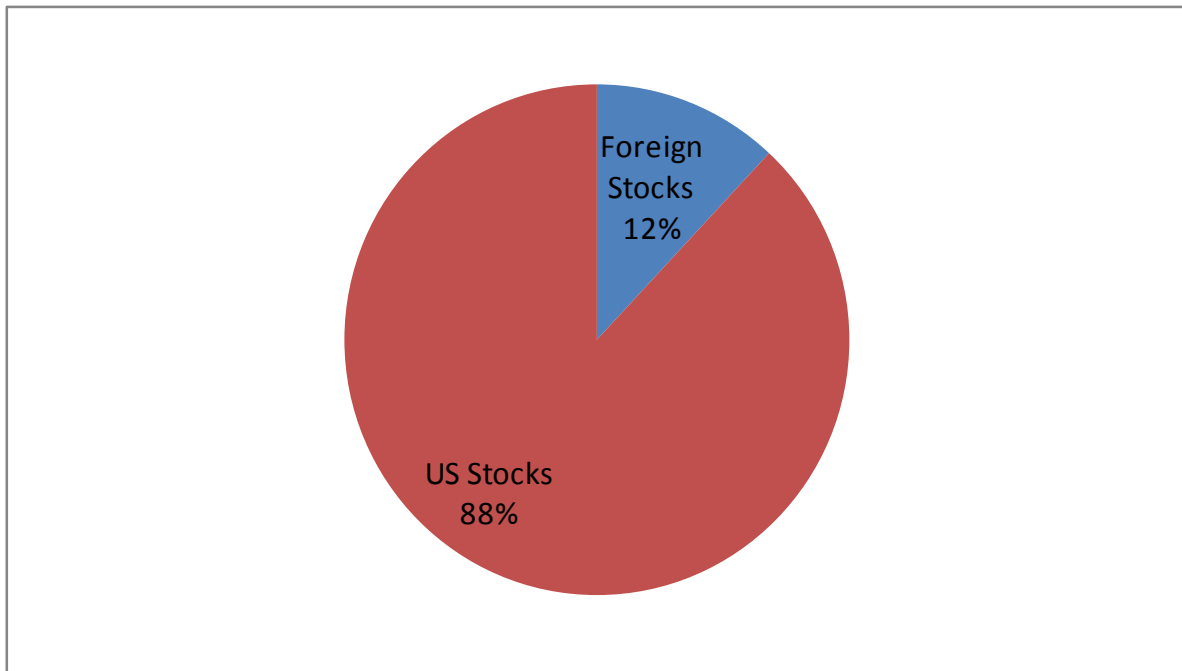
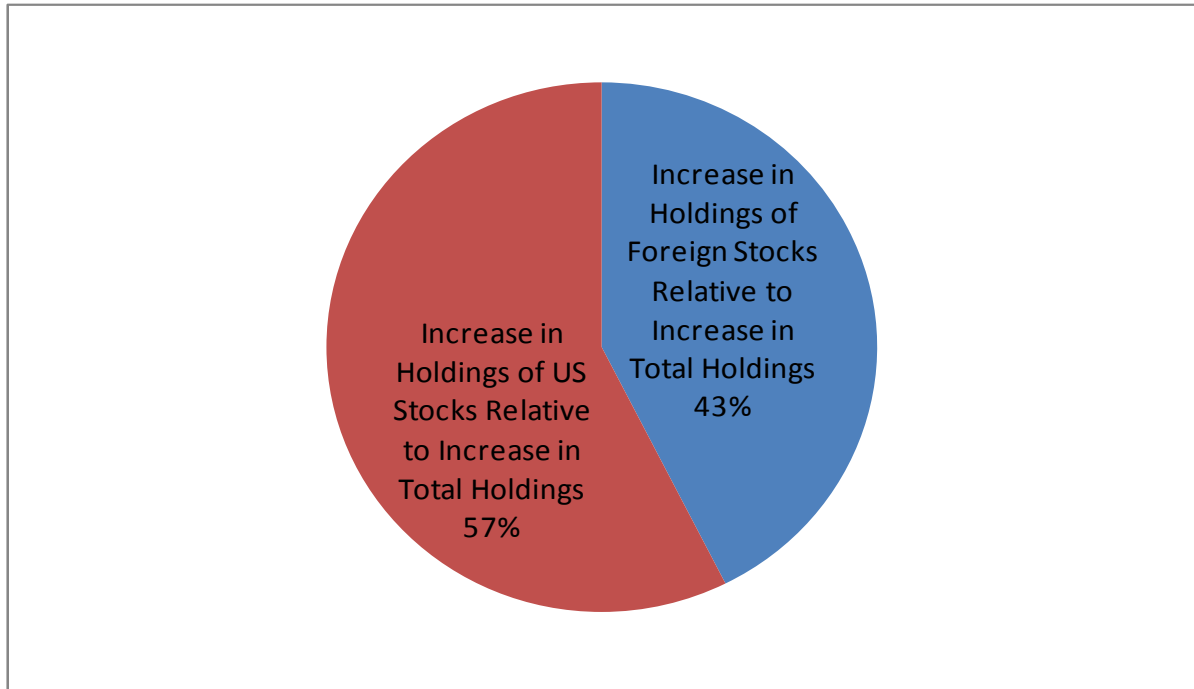


Figure 2: Holdings of Domestic and Foreign Equity by US Portfolio Investors, 2004



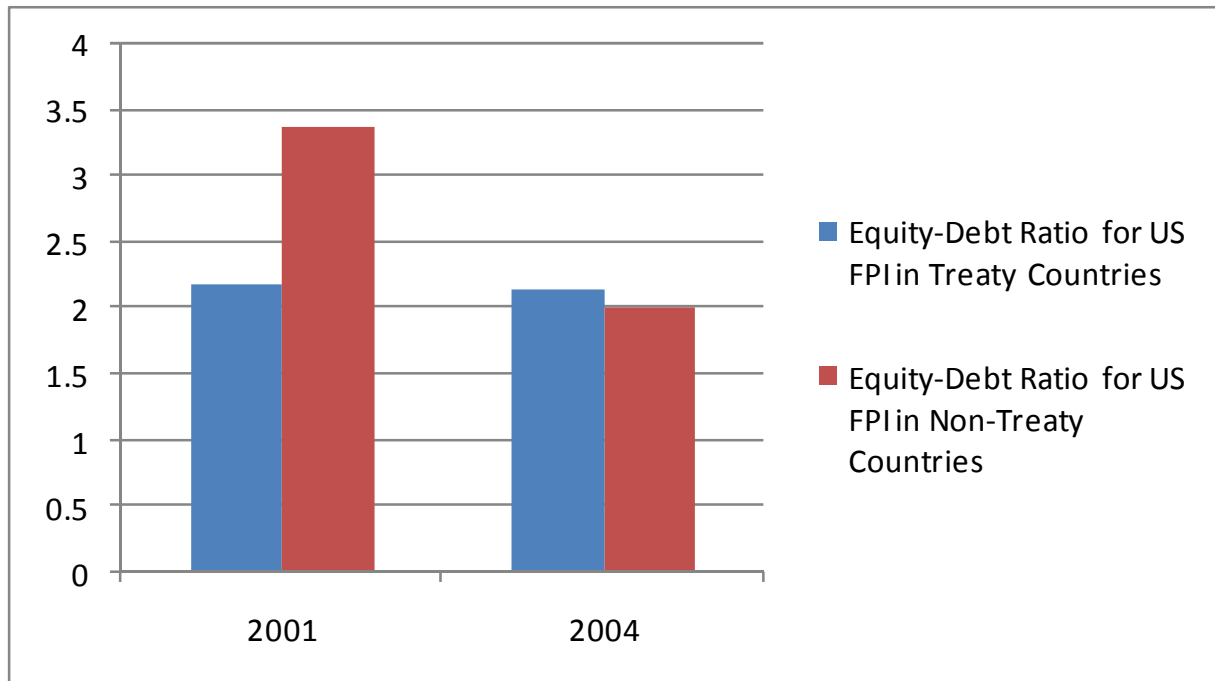
Source: Author's calculations, based on data from the Treasury International Capital (TIC) system, available at www.treas.gov/tic/. US investors' aggregate holdings are computed as US market capitalization minus foreigners' holdings of US equities plus US investors' foreign equity holdings.

Figure 3: Increases in Holdings of Domestic and Foreign Equity by US Portfolio Investors, 2004-2005



Source: Author's calculations, based on data from the Treasury International Capital (TIC) system, available at www.treas.gov/tic/. US investors' aggregate holdings in each year are computed as US market capitalization minus foreigners' holdings of US equities plus US investors' foreign equity holdings.

Figure 4: Holdings of Foreign Equities Relative to Foreign Debt by US Portfolio Investors



Source: Author's calculations, based on data from the Treasury International Capital (TIC) system, available at www.treas.gov/tic/. The equity-to-debt ratio for treaty countries is computed by aggregating equity FPI across treaty countries and dividing by the sum of debt FPI holdings (also aggregated across treaty countries). The equity-to-debt ratio for nontreaty countries is computed in an analogous manner.

Table 1: List of Treaty Countries

| | | | |
|----------------|------------|--------------------|---------------------|
| Australia | Greece | Lithuania | Slovak Republic |
| Austria | Hungary | Luxembourg | Slovenia |
| Belgium | Iceland | Mexico | South Africa |
| Canada | India | Morocco | Spain |
| China | Indonesia | Netherlands | Sweden |
| Cyprus | Ireland | New Zealand | Switzerland |
| Czech Republic | Israel | Norway | Thailand |
| Denmark | Italy | Pakistan | Trinidad and Tobago |
| Egypt | Jamaica | Philippines | Tunisia |
| Estonia | Japan | Poland | Turkey |
| Finland | Kazakhstan | Portugal | Ukraine |
| France | Korea | Romania | United Kingdom |
| Germany | Latvia | Russian Federation | Venezuela |

Source: Internal Revenue Service (IRS) Notice 2003-69 (“United States Income Tax Treaties That Meet the Requirements of Section 1(h)(11)(C)(i)(II)”), issued in October, 2003, and available at: http://www.irs.gov/irb/2003-42_IRB/ar09.html.