International Review of Business Research Papers
Vol. 7. No. 6. November 2011. Pp. 46-64

Merger Gains Induced by Dividend Tax Capitalization

Gernot Brähler[*], Max Göttsche[**] and Tobias Heerdt[***]

Under certain conditions shareholders will impound dividend taxes in equity prices. We demonstrate that such a capitalization of dividend taxes may not only be seen as a value decreasing factor but also as a source of value. A mechanism which is proper to endow shareholders with gains derived from dividend tax capitalization is a corporate merger. In corporate mergers shareholders can receive financial synergies from differences in dividend tax rates across the shareholders of the acquired and acquiring firms. This Pareto-optimal synergistic gain is based on an arbitrage scheme which provides for a revaluation of future earnings with the lower dividend tax rates of other shareholder groups. The insight of our analysis also sheds light on the line of inquiry on dividend clienteles, i.e. shareholder groups characterized by their identical tax rates on dividends. The research on dividend clienteles suggests that a change in dividend policy is costly for shareholders (see Elton and Gruber 1970). It seems reasonable to suppose that such costs may incur in a corporate merger where at least one shareholder group should face a change in dividend policy. However, our finding that under dividend tax capitalization shareholders may receive financial synergies only due to differences in dividend tax rates contradicts this suggestion to some extent.

JEL Codes: G34, H21 and H25

1. Introduction

In this paper we analyze the implications of dividend tax capitalization on equity valuation from the perspective of the target and acquiring firm`s shareholders in a tax-free corporate merger.[i] Tax capitalization is traditionally defined as the effect of taxes on prices when current prices are lower than they would be in a pre-tax consideration because of future explicit taxes on those assets (Maydew 2001).

Under certain conditions, shareholders will impound taxes in retained earnings which are taxable upon distribution in equity prices. In contrast, contributed capital does not bear an implicit tax liability as it can be returned to shareholders tax-free. When shareholders capitalize taxes on dividends paid-out of retained earnings, but not on tax-free returns of capital, there might be room for opportunities for tax arbitrage across investors facing different marginal tax rates (Stiglitz 1985). We analyze this tax arbitrage scheme and examine whether, in the presence of dividend tax capitalization, both target and acquiring firm shareholders can receive abnormal returns in a corporate merger due to differential marginal tax rates on dividends alone.

[*] Prof. Dr. Gernot Brähler, Department of Taxation/Auditing, Ilmenau University of Technology, Germany, Email: gernot.braehler@tu-ilmenau.de.

[**] Prof. Dr. Max Göttsche, Department of Controlling and Auditing, Catholic University of Eichstätt-Ingolstadt, Germany, Email: max.goettsche@ku-eichstaett.de.

[***] Tobias Heerdt, Department of Taxation, Catholic University of Eichstätt-Ingolstadt, Germany, Email: tobias.heerdt@ku-eichstaett.de.

We employ the Ohlson Model (Ohlson 1995) to demonstrate the dividend tax induced share price effects of the combination of the accounting numbers contributed capital and retained and expected earnings in a tax-free corporate merger. For this purpose we extend the Ohlson Model in the spirit of Harris and Kemsley (1999) to dividend taxes and determine the after-tax pre-combination wealth position of holding the shares in the merging firms. Additionally, we incorporate these after-dividend-tax reservation prices into an exchange ratio determination model to compare pre- and post-merger shareholder wealth. We do not incorporate growth, operational and other financial synergies, apart from the effects of dividend taxation.

Our analysis shows three main results. First, if the equity of the merging firms only consists of retained and future earnings, different shareholder-level income tax rates on dividends of combining firm shareholders should not be taken into account. When abstracting from the investors` tax basis, e.g. founding investors, in the shares of the merging firms, the combination of distributable retained and future earnings is initially wealth-increasing to shareholders facing lower tax rates when dividend taxes are impounded in reservation prices. In this case, shareholders who are subject to higher tax rates will suffer a loss, which will however be outweighed by the gain. In equilibrium, these shareholders will insist on an adjustment of the exchange ratio to their reservation value, i.e. the pre-merger value. This adjustment of the exchange ratio will completely balance out the initial increase gained by those shareholders whose dividend income is subject to lower tax rates. Therefore, the amalgamation of retained, future earnings in a corporate merger proves to be non-synergistic.[ii]

Second, the after-tax equity value of the combined firm can exceed the sum of the pre-combination values of the merging corporations under an asymmetric taxation of capital gains and capital losses; namely, if the tax basis of shareholders facing higher tax rates and the capital contributed is taken into consideration. Due to the aforementioned asymmetry, an acquiring investor`s willingness to compensate a seller for a portion of retained and future earnings, which are taxable upon distribution, is reduced to the net-of-tax amount of future dividend payments. In a corporate merger, this dividend tax capitalization effect can be partially mitigated if these retained and future earnings are apportioned to shareholders who are subject to lower dividend tax rates and therefore impute a higher after-tax value to the equity. Simultaneously, the shareholders facing higher dividend taxation on corporate distributions can participate in tax-free returns of capital paid in by the lower-taxed shareholders up to their tax basis. By relating to the exchange ratio determined by the pre-merger reservation values of the shareholders of the combining firms the reduction of the contingent dividend tax liability on retained and future earnings will endow lower-taxed shareholders with merger gains while shareholders facing higher dividend tax rates are compensated with capital repayments and thereby retain their pre-merger value. In this case the entire gain is appropriated by the lower-taxed shareholders. Hence there would be a Pareto improvement through the pure combination of different components of equity in a merger.[iii]

Third, the gain achievable for the lower-taxed shareholders in a merger can be divided between the shareholders of both the target and acquiring firm according to their relative bargaining power. Shareholders facing higher dividend tax rates who anticipate this opportunity might consider this dividend tax induced value gain when buying shares. The shareholder`s willingness to pay a higher share price would be increased in anticipation of this potential gain. Therefore, we make the following contribution to the existing dividend tax capitalization literature: that, in a taxable acquisition, rational

shareholders might not only impound their own dividend tax rate or that of a potential acquirer of their shares into share prices, but also partially the dividend tax rate of other lower-taxed investors holding shares in a firm that can merge tax-free with the firm of the shareholders with higher dividend tax rates.

Furthermore, our analysis contributes to the line of research investigating the effects of personal taxes and corporate distribution policy on dividend clienteles. Miller and Modigliani (1961) suggest that each firm has a distinctive group of shareholders characterized by their dividend tax rates. Such a dividend clientele may arise when capital gains are tax-favoured over dividend distributions. High payout firms attract shareholders with low tax rates on dividends, while low payout firms attract shareholders who are heavily taxed on dividends and therefore have a stronger preference to receive corporate earnings by way of capital gains. However, our finding that merger gains may be derived from differentiating dividend tax rates among different shareholder groups indicates the existence of an incentive for investors to ignore separate dividend clienteles.

The remainder of this paper proceeds as follows. In Section 2, we review related literature. Section 3 describes briefly the firm valuation methodology based on accounting numbers developed by Ohlson. Section 4 discusses the principles of dividend tax capitalization and the tax wedge between contributed capital and retained and current earnings within the Ohlson framework. In Section 5, we incorporate the Ohlson Model extended by Harris and Kemsley to dividend taxes into a merger exchange ratio determination model and formally analyze the effects of dividend tax capitalization on shareholder wealth. In Section 6, we offer concluding comments.

2. Related Research

There is extensive research examining the share price effects of corporate taxes in tax-free mergers. Studies related to corporate tax benefits include the use of the target`s net operating loss carryforwards and tax credits (Hayn 1989 and Peterson & Peterson 1991), and enhanced interest deduction from an increased leverage (Leland 2007 and Devos, Kadapakkam & Krishnamurthy 2009). Shih (1994) examines whether a conglomerate merger offers improved chances that tax savings associated with write-offs will be immediately utilized in full, rather than deferred as less valuable loss carryforwards. One major insight from this body of research is that corporate taxes can provide shareholders with purely financial synergies in corporate mergers. However, this line of inquiry does not deal with the impact of shareholder-level taxes.

Studies on the influence of shareholder-level taxes on stock prices almost solely focus on taxable acquisitions. For example, Landsman and Shackelford (1995), Reese (1998), Poterba and Weisbrenner (2001), Klein (2001), Ayers, Lefanowicz & Robinson (2003), Blouin, Raedy & Shackelford (2003), Jin (2006), and George & Hwang (2007) report that capital gains tax increases stock prices, since sellers require higher prices to sell assets if they have to pay taxes when doing so. The premium paid to the seller is required to eliminate the lock-in-effect of capital gains taxes. Therefore, capital gains tax is not a source of financial synergies to sellers as the premium is collected by the government. Erickson (1998) uses an all party approach including acquiring firm, target firm, and target shareholders to examine the effect of taxes on the structure of corporate acquisitions. The results indicate that the acquiring firm´s tax and nontax characteristics significantly affect transaction structures. However, the implications of dividend tax

capitalization in a tax-free corporate merger are not in the main focus of the considerations. Another stream of research analyzes stock price reactions to capital gains tax rates cuts. Lang & Shackelford (2000) and also Dai, Maydew, Shackelford & Zhang (2008) find evidence that a reduction of the capital gains tax rate increases stock prices to the extent that shareholders expect returns to be taxed as capital gains. This increase in market value due to a reduced capitalization of capital gains taxes is induced by tax legislation. Generally speaking, the additional shareholder wealth is not generated by a value-creating mechanism that falls under the rubric of corporate synergy.

To the best of our knowledge, synergistic effects of shareholder taxes in tax-free mergers have not been considered in prior research, as related studies are limited to synergies derived from corporate taxes in non-taxable mergers and non-synergistic stock price effects of shareholder taxes in taxable acquisitions.

3. Firm Valuation Model

The Ohlson Model assumes that the firm market value equals the present value of future expected dividends, yielding:

$$P_{it} = \sum_{\tau=1}^{\infty} R_f^{-\tau} E_t \left[d_{it+\tau} \right] \qquad (1)$$

Where

P_{it} is the market value or price of firm i`s equity at time t,

E_t is the expected value operator conditioned on the date t information,

$d_{it+\tau}$ is net dividends of firm i paid at date t,

$R_f^{-\tau}$ is the risk free rate of return plus 1.

Equation (1) can be expressed in terms of the book value of shareholders` equity and the discounted value of all expected residual income, defined as current earnings less the cost of capital, as described by equation (2) below, provided the clean surplus relation expressed by $BV_{it} = BV_{it-1} + NI_{it} - d_{it}$ holds:

$$P_{it} = BV_{it} + \sum_{\tau=1}^{\infty} R_f^{-\tau} E_t \left[NI_{it+\tau} - \left(R_f - 1\right)\left(BV_{it+\tau-1}\right) \right] \qquad (2)$$

Where

BV_{it} is the reported book value of shareholder`s equity of firm i at time t,

NI_{it} is the reported earnings of firm i at time t.

In (2) a firm`s market value consists of its book value adjusted for the present value of its expected earnings. Alternatively, equation (2) can be interpreted that anticipated future earnings fill the gap between market and book value (Peasnell 1980).

An important underlying assumption of the Ohlson Model is that dividends are paid out of equity. Consistent with the clean surplus relation, dividends reduce current book value, which implies $\partial BV_{it} / \partial d_{it} = -1$, but not current earnings so that $\partial NI_{it} / \partial d_{it} = 0$ holds.

4. Dividend Tax Capitalization

The extent to which dividend taxes affect asset prices has long been of interest to tax researchers in accounting, economics and finance. Auerbach (1979) and Bradford (1981) theoretically demonstrate that a rational investor will impound dividend taxes into share prices under the assumption that equity will be paid out as dividends. A founding investor who intends to hold the shares and receive corporate earnings by way of dividend distributions will consider dividend taxes as follows:

$$P_{it} = \sum_{\tau=1}^{\infty} R_f^{-\tau} E_t \left[(1 - t_d) d_{it+\tau} \right] \tag{3}$$

where t_d is the dividend tax rate assumed to be equal across time.

A founding investor is willing to sell his stock if the minimum sale price (P_{st}^{min}) decreased by the capital gain tax liability ($P_{st}^{min} * t_{sc}$) exceeds or at least equals the shareholder`s value when holding the shares which is expressed as follows:

$$P_{st}^{min} - P_{st}^{min} * t_{sc} \geq \sum_{\tau=1}^{\infty} R_f^{-\tau} E_t \left[(1 - t_{sd}) d_{it+\tau} \right] \tag{4}$$

Where

t_{sc} is the seller`s capital gains tax rate assumed to be equal across time,

t_{sd} is the seller`s dividend tax rate assumed to be equal across time.

The acquirer will impound dividend taxes into equity prices if there is an asymmetric tax treatment of future dividends paid out of the acquired accumulated earnings and the capital losses caused by the decline in value of the dividend distributions.[iv] The tax basis will not shelter an acquiring investor from the implications of dividend taxation if there is no equivalent offsetting of the generated losses for tax purposes (Ball 1984).[v] Taking an impure tax deduction of capital losses into account results in a maximum purchase price:[vi]

$$P_{at}^{max} = \sum_{\tau=1}^{\infty} R_f^{-\tau} E_t \left[(1 - t_{ad}) d_{it+\tau} + \Theta d_{it+\tau} t_{ac} \right] \tag{5}$$

Where

t_{ac} is the acquirer`s capital gain tax rate assumed to be equal across time,

t_{ad} is the acquirer`s dividend tax rate assumed to be equal across time,

Θ is a factor ($0 \leq \Theta \leq 1$).

The factor Θ expresses that capital losses might not be deductible against personal income either in full or immediately upon their occurrence (Ball 1984). If Θ equals 1, and t_{ad} equals t_{ac}, capital losses are completely and immediately deductible against dividend income. As a consequence, the acquirer is willing to compensate the seller for the pre-tax value of corporate earnings as their distribution would be de facto non-taxable due to the entire offsetting of dividends against capital losses.[vii] If Θ equals 0, capital losses from share trading or valuation allowance due to dividend distributions are not deductible at all. In this case, the acquirer`s reservation price is reduced to:

$$P_{at}^{max} = \sum_{\tau=1}^{\infty} R_f^{-\tau} E_t \left[(1 - t_{ad}) d_{it+\tau} \right] \quad (6)$$

A trading between the seller and the acquirer will take place if $P_{at}^{max} \geq P_{st}^{min}$, so that considering assumption (4) with assumption (6) yields:

$$\sum_{\tau=1}^{\infty} R_f^{-\tau} E_t \left[(1 - t_{ad}) d_{it+\tau} \right] (1 - t_{sc}) \geq \sum_{\tau=1}^{\infty} R_f^{-\tau} E_t \left[(1 - t_{sd}) d_{it+\tau} \right] \quad (7)$$

Equation (7) illustrates that, even when shareholders sell shares and do not receive dividends, dividend taxation has an indirect valuation implication in case of an impure capital gains tax regime.[viii] The asymmetric treatment of dividend income and capital losses causes the dividend tax liability to be passed on from the seller to the acquirer (Ball 1984). In other words, the acquirer will capitalize the assumed dividend tax liability into his reservation price. The same applies when the acquirer resells the shares and the buyer implicitly considers dividend taxes in the purchase price. Therefore, not only founding investors intending to hold shares but also acquiring investors will be subject to dividend tax capitalization if the deduction of capital losses is impure.[ix]

Tax researchers found empirical evidence for the existence of dividend tax capitalization. Poterba & Summers (1984), Erickson & Maydew (1998) and Dhaliwal, Erickson & Li (2005) investigate the effects of dividend taxation on stock prices. Their results suggest the existence of an implied tax in asset prices. Harris & Kemsley (1999) and Harris, Hubbard & Kemsley (2001) investigate the capitalization of dividend taxes by exploiting that shareholders are taxed on the portion of the distributions which is funded by retained earnings, but receive tax-free repayments of contributed capital. They predict that the coefficients from a regression of market value on book value and expected earnings should vary across firms with different amounts of contributed capital. Their empirical results indicate that retained and future earnings are valued less per unit than paid-in equity.

To demonstrate the tax wedge between the accounting numbers contributed capital and corporate earnings we employ the Ohlson Model. The Ohlson Model implicitly considers corporate taxes by relating to accounting numbers, such as book values of shareholder`s equity and earnings which are already decreased by entity-level taxes, but does not include shareholder taxes (Hanlon, Myers & Shevlin 2003). Harris & Kemsley (1999) and also Harris, Hubbard & Kemsley (2001) extend the Ohlson framework to incorporate dividend taxes. When shareholders pay dividend taxes upon

distributions of retained earnings and receive returns of paid-in capital tax free equation (8) follows:

$$P_{it} = \sum_{\tau=1}^{\infty} R_f^{-\tau} E_t\left[(1-t_d)\,d_{it+\tau}\right] + \sum_{t=0}^{\infty} R_f^{-\tau} E_t\left[NC_{it}\right] \qquad (8)$$

where

d_{it} is the taxable dividend distribution funded by retained earnings of firm i at time t,

NC_{it} is the non-taxable net distribution of contributed capital of firm i at time t; NC < 0 for capital investments and NC > 0 for returns of contributed capital.

Like Harris and Kemsley, we modify equation (8) and replace dividend distributions with the accounting numbers contributed capital (C_{it}), retained earnings (RE_{it}), and current earnings (NI_{it}). This division of shareholders` equity into contributed capital and retained and current earnings can be expressed as $C_{it} = C_{it-1} - NC_{it}$ and $RE_{it} = RE_{it-1} + NI_{it} - d_{it}$ in terms of the clean surplus relation resulting $RE_{it} + C_{it} = RE_{it-1} + C_{it-1} + NI_{it} - d_{it} - NC_{it}$ for total equity.

Assuming that equity is paid out as dividends the accounting implications of equity distributions $\partial BV_{it} / \partial d_{it} = -1$ and $\partial NI_{it} / \partial d_{it} = 0$ can be specified for retained and future earnings into $\partial RE_{it} / \partial d_{it} = -1$ and $\partial NI_{it} / \partial d_{it} = 0$, respectively for contributed capital into $\partial C_{it} / \partial NC_{it} = -1$ and $\partial NI_{it} / \partial NC_{it} = 0$. Before considering dividend taxes the distribution of one portion of retained earnings or contributed capital decreases share price correspondingly, so that $\partial P_{it} / \partial d_{it} = -1$ still holds.

Incorporating dividend taxes when retained and current earnings are subject to dividend taxation upon distribution yields $\partial P_{it} / \partial d_{it} = -(1-t_d)$. In contrast, returns of paid-in equity equally reduce contributed capital so that $\partial P_{it} / \partial NC_{it} = -1$ applies. As dividends bear an implicit tax liability while contributed capital can be repaid tax-free, dividend distributions and capital repayments have different implications on share prices as demonstrated below in equation (9):[x]

$$P_{it} = C_{it} + (1-t_d)RE_{it} + \sum_{\tau=1}^{\infty} R_f^{-\tau} E_t\left[(1-t_d)NI_{it+\tau} - (R_f - 1)\left[(1-t_d)RE_{it+\tau-1} + C_{it+\tau-1}\right]\right] \qquad (9)$$

5. Dividend Tax Induced Gains in Corporate Mergers

In a merger, the exchange ratio represents the number of shares an acquiring firm offers in exchange for one share of the acquired firm. An important attribute of the exchange ratio is the division of synergies yielded by the merger (Bae & Sakthivel 2000). Another role of the exchange ratio is the determination of the wealth position of both target and acquiring firm shareholders compared to their pre-merger value. Depending on the arrangement of the exchange ratio, shareholders might experience improvement or diminution of their pre-merger value (Larson & Gonedes 1969). Therefore, a rational investor will require an exchange ratio which compensates him for his reservation value, so that $P_{it}^{M} \geq P_{it}^{P}$ follows, where P_{it}^{M} denotes the post-merger value and P_{it}^{P} the pre-combination value.

Before we express that $P_{it}^{M} \geq P_{it}^{P}$ in terms of the Ohlson Model, we simplify the firm valuation model in terms of the cost of capital consistent with Ohlson (1995). We define $NI_{it}^{a} = NI_{it} - (R_f - 1)[BV_{it-1}]$, where NI_{it}^{a} denotes firm i`s earnings decreased by a charge for the use of capital, so that firm value can be expressed as the sum of shareholder`s equity and future earnings on an after-cost-of-capital basis as follows:

$$P_{it} = BV_{it} + \sum_{\tau=1}^{\infty} R_f^{-\tau} E_t \left[NI_{it+\tau}^{a} \right] \qquad (10)$$

We express $P_{it}^{M} \geq P_{it}^{P}$ and equation (10) in terms of the Ohlson framework. The post-merger value of the combined firm (ab) before considering dividend taxes has to endow the shareholders of the acquired firm (a) with at least the pre-merger wealth position which implies:

$$\alpha \left[(BV_{at} + BV_{bt}) + \sum_{\tau=1}^{\infty} R_f^{-\tau} E_t \left[NI_{at+\tau}^{a} + NI_{bt+\tau}^{a} \right] \right] \geq BV_{at} + \sum_{\tau=1}^{\infty} R_f^{-\tau} E_t \left[NI_{at+\tau}^{a} \right] \qquad (11a)$$

where α is the exchange ratio of the shareholders of the target firm. The investors of the acquiring firm (b) will also require a post-merger wealth which compensates them for their reservation value. This condition is expressed as follows:

$$(1-\alpha) \left[(BV_{at} + BV_{bt}) + \sum_{\tau=1}^{\infty} R_f^{-\tau} E_t \left[NI_{at+\tau}^{a} + NI_{bt+\tau}^{a} \right] \right] \geq BV_{bt} + \sum_{\tau=1}^{\infty} R_f^{-\tau} E_t \left[NI_{bt+\tau}^{a} \right] \qquad (11b)$$

where $(1-\alpha)$ is the exchange ratio of the shareholders of the acquiring firm. The exchange ratios are determined by the relative pre-merger wealth positions, which constitute the boundaries for merger negotiations as follows:

$$\alpha = \frac{P_{at}^{P}}{P_{at}^{P} + P_{bt}^{P}}$$

$$1-\alpha = \frac{P_{bt}^{P}}{P_{at}^{P} + P_{bt}^{P}}$$

To analyze the implications of dividend tax capitalization in a corporate merger on the wealth position of the shareholders of the merging firms, we assume in a first step that equity consists only of retained and future earnings, i.e. equity components which are subject to dividend taxation upon distribution. For this purpose, we equate

$$\delta_{it} = \left[RE_{it} + \sum_{\tau=1}^{\infty} R_f^{-\tau} E_t \left[NI_{it+\tau}^{a} \right] \right]$$

and include δ_{it} in equation (12) which compares after-dividend-tax post- and pre-merger value of shareholders of firm (a), when the exchange ratio α is determined by the after-dividend-tax reservation values as follows:

$$\alpha = \frac{(1-t_{ad})\delta_{at}}{(1-t_{ad})\delta_{at} + (1-t_{bd})\delta_{bt}}$$

$$\frac{(1-t_{ad})\delta_{at}}{(1-t_{ad})\delta_{at} + (1-t_{bd})\delta_{bt}}(1-t_{ad})(\delta_{at} + \delta_{bt}) \geq (1-t_{ad})\delta_{at} \qquad (12)$$

Equation (12) is satisfied, if $t_{bd} \geq t_{ad}$. The magnitude of the gain apportionable to the shareholders of the acquired firm, if $t_{bd} > t_{ad}$ holds, can be determined as follows:

$$P_{at}^{M} - P_{at}^{P} = \alpha * \delta_{bt}(t_{bd} - t_{ad}) \qquad (13)$$

Thus, the merger seems to endow the shareholders of the acquired firm with abnormal returns which result from the following three factors: the difference in the dividend tax rates of target and acquiring firm shareholders (for example, within the European Union there is a spread in dividend tax rates between 0 % (Estonia, Greece, Latvia) and 30 % (Sweden)); the accumulated retained and future earnings of the acquiring firm; and the exchange ratio of the acquired firm shareholders based on after-dividend tax reservation values.

Under $t_{bd} > t_{ad}$ and an after-dividend-tax exchange ratio $(1-\alpha)$ the merger would diminish the pre-merger wealth position of the shareholders of the acquiring firm (b) according to relation (14).

$$(1-\alpha) = \frac{(1-t_{bd})\delta_{bt}}{(1-t_{ad})\delta_{at} + (1-t_{bd})\delta_{bt}}$$

$$\frac{(1-t_{bd})\delta_{bt}}{(1-t_{ad})\delta_{at} + (1-t_{bd})\delta_{bt}}(1-t_{bd})(\delta_{at} + \delta_{bt}) < (1-t_{bd})\delta_{bt} \qquad (14)$$

When the dividend tax rate of the shareholders of the acquiring firm (t_{bd}) exceeds the dividend tax rate of the shareholders of the acquired firm (t_{ad}) the loss incurred by the shareholders of the acquiring firm is determined as follows:

$$P_{bt}^{M} - P_{bt}^{P} = (1-\alpha) * \delta_{at}(t_{ad} - t_{bd}) \qquad (15)$$

where $(t_{ad} - t_{bd}) < 0$.

Pursuant to equation (13) the merger is beneficial to shareholders of the acquired firm (a) while pursuant to equation (15) the shareholders of the acquiring firm (b) realize a diminution of their value caused by the dividend tax differential ($t_{bd} > t_{ad}$). The effect of dividend tax capitalization on retained and current earnings will favour lower-taxed

shareholders more than it penalizes higher-taxed shareholders under after-dividend tax reservation prices. $P_{at}^{M} - P_{at}^{P} > P_{bt}^{M} - P_{bt}^{P}$ holds, which implies $\prod + \Delta P_{at} - \Delta P_{bt} > 0$, where the gain apportioned to the acquired firm`s shareholders ($\Delta P_{at} > 0$) exceeds the loss of the shareholders of the acquiring firm ($\Delta P_{bt} < 0$). Determining the excess of gains over losses in terms of retained and future earnings and the tax wedge of dividend tax rates yields:

$$\prod = \frac{\delta_{at} * \delta_{bt} \left(t_{bd} - t_{ad}\right)^2}{\delta_{at}\left(1 - t_{ad}\right) + \delta_{bt}\left(1 - t_{bd}\right)} \tag{16}$$

The source of the gain ($\prod$) is the disproportionate participation of the shareholders of the acquiring firm in the retained and future earnings of the merged firm due to the application of after-dividend tax reservation prices for purposes of the formation of the exchange ratio.

However, in spite of the excess of dividend tax induced gains over losses, the merger turns out to be Pareto-inferior, since the wealth position of the acquiring firm shareholders is decreased by the merger. Consequently, the shareholders of the acquiring firm will insist on an adjustment of the exchange ratio or otherwise refuse to conduct the merger. When post-merger value equals pre-merger value, which implies:

$$\left(1-\alpha\right)^{*}\left(1-t_{bd}\right)\left(\delta_{at}+\delta_{bt}\right) = \left(1-t_{bd}\right)\delta_{bt} \tag{17}$$

the minimum exchange ratio $\left(1-\alpha\right)^{*}$ is determined as follows:

$$\left(1-\alpha\right)^{*} = \frac{\left(1-t_{bd}\right)\delta_{bt}}{\left(1-t_{bd}\right)\left(\delta_{at}+\delta_{bt}\right)} = \frac{\delta_{bt}}{\delta_{at}+\delta_{bt}}$$

The minimum exchange ratio $\left(1-\alpha\right)^{*}$ the shareholders of the acquiring firm will demand in order to maintain their pre-merger wealth position is determined by the pre-dividend tax relation of the acquiring firm`s accumulated retained and current earnings to the retained and current earnings of the combined firm. Recall that the exchange ratio of the shareholders of the acquiring firm, based on after-dividend tax prices which are lower than the pre-merger wealth position, yields:

$$\left(1-\alpha\right) = \frac{\left(1-t_{bd}\right)\delta_{bt}}{\left(1-t_{ad}\right)\delta_{at} + \left(1-t_{bd}\right)\delta_{bt}}$$

so that the exchange ratio based on pre-dividend tax values exceeds the exchange ratio determined by shareholder reservation prices under dividend tax capitalization which is demonstrated below, if $t_{bd} > t_{ad}$

$$\frac{\left(1-t_{bd}\right)\delta_{bt}}{\left(1-t_{bd}\right)\left(\delta_{at}+\delta_{bt}\right)} = \frac{\delta_{bt}}{\delta_{at}+\delta_{bt}} = \left(1-\alpha\right)^{*} > \frac{\left(1-t_{bd}\right)\delta_{bt}}{\left(1-t_{ad}\right)\delta_{at} + \left(1-t_{bd}\right)\delta_{bt}} = \left(1-\alpha\right)$$

As a consequence, the exchange ratio of the shareholders of the acquired firm yields:

$$\alpha^* = \frac{\delta_{at}}{\delta_{at} + \delta_{bt}}$$

when the shareholders of the acquiring firm insist on an adequate compensation for their reservation value. Incorporating the exchange ratio α^* into equation (12), i.e. acquiring firm`s shareholders require at least their pre-merger reservation value, illustrates that the wealth position of the shareholders of the acquiring firm remains unchanged:

$$\frac{\delta_{at}}{\delta_{at} + \delta_{bt}}\left(1 - t_{ad}\right)\left(\delta_{at} + \delta_{bt}\right) = \left(1 - t_{ad}\right)\delta_{at} \qquad (18)$$

Thus, an exchange ratio based on after-dividend tax reservation prices distorts shareholders` wealth positions in a merger if dividend tax rates are different across target and acquiring firms, as it endows lower-taxed shareholders with abnormal returns and causes a loss for higher-taxed shareholders. Notwithstanding an excess of these tax-induced gains over losses, the merger is non-synergistic because of Pareto inferiority. In contrast, an exchange ratio based on pre-dividend tax values of retained and future earnings guarantees the compensation of reservation prices of both target and acquiring firm shareholders, although shareholders capitalize dividend taxes into share prices.

Next, we add contributed capital to the retained and future earnings. In this case, the reservation price of the shareholders of the target and the acquiring firm equals:

$$P_{it}^{P} = C_{it} + \left(1 - t_d\right)\delta_{it} \qquad (19)$$

The tax basis of the shareholders B_{it}, i.e. the acquisition costs, comprises contributed capital (C_{it}) and retained and future earnings (δ_{it}), including an inherent dividend tax discount $\left(1 - t_d\right)$, and can be expressed as $B_{it} = C_{it} + \left(1 - t_d\right)\delta_{it}$. We introduce B_{it}, because under the jurisdiction of certain countries repayments of contributed capital, although generally exempt from dividend taxes, are subject to capital gains taxation to the extent that the return of capital exceeds the shareholder`s tax basis (B_{it}), which is demonstrated below:

$$\partial P_{it} / \partial NC_{it} = -1 \qquad \text{if:} \quad NC > 0 \text{ and } \sum_{1}^{B_{it}} NC_{it}$$

$$\partial P_{it} / \partial NC_{it} = -\left(1 - t_c\right) \qquad \text{if:} \quad NC > 0 \text{ and } \sum_{B_{it}}^{\infty} NC_{it}$$

To avoid the capital gains tax implications from capital repayments increasing shareholder`s acquisition costs we restrict our model to returns of capital resulting in $\partial P_{it} / \partial NC_{it} = -1$.

The incorporation of contributed capital results in the following after-dividend tax exchange ratio of the shareholders of the acquired firm:

$$\alpha = \frac{C_{at} + (1 - t_{ad})\delta_{at}}{C_{at} + (1 - t_{ad})\delta_{at} + C_{bt} + (1 - t_{bd})\delta_{bt}}$$

We include α in the reservation that the pre-merger wealth position has to be maintained, which implies:

$$\alpha\left[(C_{at} + C_{bt}) + (1 - t_{ad})(\delta_{at} + \delta_{bt})\right] \geq C_{at} + (1 - t_{ad})\delta_{at} \qquad (20)$$

Equation (20) holds, if $t_{bd} \geq t_{ad}$. The gain induced by the differentiation of dividend tax rates between target and acquiring firm shareholders is determined as follows:

$$P_{at}^{M} - P_{at}^{P} = \alpha(t_{bd} - t_{ad})\delta_{bt} \qquad (21)$$

Given equation (21), the source of the gain apportionable to the shareholders of the acquired firm is the revaluation of retained and future earnings of the acquiring firm based on the difference between the dividend tax rates. The magnitude of the gain is determined by the multiplication of $(t_{bd} - t_{ad})\delta_{bt}$ with contributed capital and the after-dividend tax values of retained and future earnings of the acquired firm, i.e. the overall pre-merger value:

$$P_{at}^{M} - P_{at}^{P} = \frac{\overbrace{(t_{bd} - t_{ad})\delta_{bt}}^{\text{Revaluation}}}{C_{at} + (1 - t_{ad})\delta_{at} + C_{bt} + (1 - t_{bd})\delta_{bt}}\left[C_{at} + (1 - t_{ad})\delta_{at}\right] \qquad (22)$$

If $t_{bd} > t_{ad}$ holds, the shareholders of the acquiring firm will realize a diminution of their pre-merger wealth position as presented in equation (23) below under an after-dividend tax exchange ratio $(1 - \alpha)$:

$$(1 - \alpha) = \frac{C_{bt} + (1 - t_{bd})\delta_{bt}}{C_{at} + (1 - t_{ad})\delta_{at} + C_{bt} + (1 - t_{ad})\delta_{at}}$$

$$(1 - \alpha)\left[(C_{at} + C_{bt}) + (1 - t_{bd})(\delta_{at} + \delta_{bt})\right] < C_{bt} + (1 - t_{bd})\delta_{bt} \qquad (23)$$

The magnitude of the loss incurred by the shareholders of the acquiring firm yields:

$$P_{bt}^{M} - P_{bt}^{P} = (1 - \alpha)(t_{ad} - t_{bd})\delta_{at} \qquad (24)$$

The reason for the loss is the revaluation of the retained and future earnings of the acquired firm (δ_{at}) with a higher dividend tax rate. The extent of the loss depends on the

capital contributed by the shareholders of the acquiring firm and by the after-dividend tax value of the retained and future earnings of the acquiring firm as follows:

$$P_{bt}^{M} - P_{bt}^{P} = \frac{\overbrace{\left(t_{ad} - t_{bd}\right)\delta_{at}}^{\text{Revaluation}}}{C_{at} + \left(1 - t_{ad}\right)\delta_{at} + C_{bt} + \left(1 - t_{bd}\right)\delta_{bt}} \left[C_{bt} + \left(1 - t_{bd}\right)\delta_{bt}\right] \qquad (25)$$

Under the dividend tax differential $t_{bd} > t_{ad}$ the lower-taxed shareholders profit from the amalgamation of paid-in equity and retained and future earnings of the merging firms while the higher-taxed shareholders` wealth position decreases. In our examination, which is limited to retained and future earnings of the merging firms subject to dividend taxation upon distribution, the increase in value of the shareholders of the acquired firm ($\Delta P_{at} > 0$) generally exceeds the diminution of wealth of the shareholders of the acquiring firm ($\Delta P_{bt} < 0$), if the exchange ratio is based on after-dividend tax reservation prices. Adding contributed capital to the consideration it is a priori open if dividend tax capitalization is wealth-increasing or decreasing. The overall wealth effect yields:

$$\prod = \frac{\overbrace{C_{at}\delta_{bt}\left(t_{bd} - t_{ad}\right)}^{\substack{\text{Gain of firm a) shareholders}\\ \text{from the revaluation of earnings}}} + \overbrace{C_{bt}\delta_{at}\left(t_{ad} - t_{bd}\right)}^{\substack{\text{Loss of firm b) shareholders}\\ \text{from the revaluation of earnings}}} + \overbrace{\delta_{at}\delta_{bt}\left(t_{bd} - t_{ad}\right)^{2}}^{\substack{\text{Overall gain from the determination of the}\\ \text{exchange ratio by after-dividend-tax prices}}}}{C_{at} + \left(1 - t_{ad}\right)\delta_{at} + C_{bt} + \left(1 - t_{bd}\right)\delta_{bt}} \qquad (26)$$

The first term in equation (26) shows the gain arising from the revaluation of portions of the earnings of the acquiring firm with the dividend tax rate of the shareholders of the acquired firm. Prior to the merger, these earnings are completely discounted with the dividend tax rate of the shareholders of the acquiring firm, so that $\left(1 - t_{bd}\right)\delta_{bt}$ applies. After the merger the earnings` value is increased due to the capitalization with a lower dividend tax rate of the shareholders of the acquired firm, which implies $\left(1 - t_{ad}\right)\delta_{bt}$. The extent of this revaluation effect depends on the amount of the capital contributed by the shareholders of the acquired firm (C_{at}). The wealth-increasing function of C_{at} compensates the shareholders of the acquiring firm for earnings which are apportioned to the lower-taxed shareholders of the acquired firm.

The marginal value of the gain yields:

$$\lim_{C_{at} \to \infty} = \delta_{bt}\left(t_{bd} - t_{ad}\right)$$

The expression of the second term shows a loss incurred by the shareholders of the acquiring firm. Since the difference in dividend tax rates $\left(t_{ad} - t_{bd}\right)$ is negative, the shareholders of the acquiring firm will realize a loss from the revaluation of the earnings of the acquired firm (δ_{at}).

$$\lim_{C_{bt} \to \infty} = \delta_{at}\left(t_{ad} - t_{bd}\right)$$

The third term equals the Pareto-inferior gain according to equation (16) which arises out of dividend tax-induced distortions of the determination of the exchange ratio. Whether the merger is beneficial, i.e. dividend tax capitalization proves to be synergistic or not, is demonstrated below:

$$\prod > 0 \quad \text{if:} \quad C_{at}\delta_{bt}\left(t_{bd}-t_{ad}\right)+\delta_{at}\delta_{bt}\left(t_{bd}-t_{ad}\right)^2 > C_{bt}\delta_{at}\left(t_{ad}-t_{bd}\right) \tag{27a}$$

$$\prod < 0 \quad \text{if:} \quad C_{at}\delta_{bt}\left(t_{bd}-t_{ad}\right)+\delta_{at}\delta_{bt}\left(t_{bd}-t_{ad}\right)^2 < C_{bt}\delta_{at}\left(t_{ad}-t_{bd}\right) \tag{27b}$$

If $\prod < 0$ the merger will not take place as the shareholders of the acquiring firm incur a loss which cannot be compensated with gains realized by the shareholders of the acquired firm. In case of $\prod > 0$ the gain of the shareholders of the acquired firm exceeds the loss of the shareholders of the acquiring firm. However, notwithstanding $\prod > 0$ the shareholders of the acquiring firm will demand a Pareto-efficient exchange ratio $\left(1-\alpha\right)^*$ which will guarantee the continuance of their reservation price according to equation (28):

$$\left(1-\alpha\right)^* = \frac{C_{bt}+\left(1-t_{bd}\right)\delta_{bt}}{\left(C_{at}+C_{bt}\right)+\left(1-t_{bd}\right)\left(\delta_{at}+\delta_{bt}\right)}$$

$$\left(1-\alpha\right)^*\left[\left(C_{at}+C_{bt}\right)+\left(1-t_{bd}\right)\left(\delta_{at}+\delta_{bt}\right)\right] = C_{bt}+\left(1-t_{bd}\right)\delta_{bt} \tag{28}$$

From $\left(1-\alpha\right)^*$ follows the applicable exchange ratio for the shareholders of the acquired firm α^* when $\alpha^* = 1-\left(1-\alpha\right)^*$:

$$\alpha^* = 1-\frac{C_{bt}+\left(1-t_{bd}\right)\delta_{bt}}{\left(C_{at}+C_{bt}\right)+\left(1-t_{bd}\right)\left(\delta_{at}+\delta_{bt}\right)}$$

Incorporating α^* into an equation which determines the change of the value of the shareholders of the acquired firm ($P_{at}^M - P_{at}^P$) yields:

$$\prod_a = \frac{C_{at}\delta_{bt}\left(t_{bd}-t_{ad}\right)+C_{bt}\delta_{at}\left(t_{ad}-t_{bd}\right)}{\left(C_{at}+C_{bt}\right)+\left(1-t_{bd}\right)\left(\delta_{at}+\delta_{bt}\right)} \tag{29}$$

Under $C_{at}\delta_{bt}\left(t_{bd}-t_{ad}\right) < C_{bt}\delta_{at}\left(t_{ad}-t_{bd}\right)$ the shareholders of the acquired firm will not accede to the merger due to $\prod_a < 0$, where $\prod_a$ describes the change of the value. Given $C_{at}\delta_{bt}\left(t_{bd}-t_{ad}\right) > C_{bt}\delta_{at}\left(t_{ad}-t_{bd}\right)$ the merger turns out to be wealth-increasing to the shareholders of the acquired firm. The positive wealth effect of the revaluation of the earnings of the acquiring firm (δ_{bt}) by the shareholders of the acquired firm exceeds the negative wealth effect of the revaluation of the earnings of the acquired firm (δ_{at}) by the shareholders of the acquiring firm. Furthermore, equation (29) expresses that the shareholders of the acquired firm bear the loss realized by the shareholders of the

acquiring firm ($C_{bt}\delta_{at}(t_{ad}-t_{bd})$) which decreases the realized gain ($C_{at}\delta_{bt}(t_{bd}-t_{ad})$) under the continuance of the wealth position of the shareholders of the acquiring firm due to $(1-\alpha)^*$.

Consequently, if $C_{at}\delta_{bt}(t_{bd}-t_{ad}) > C_{bt}\delta_{at}(t_{ad}-t_{bd})$ the shareholders of the acquired firm receive abnormal returns on the combination of the equity components δ_{it} and C_{it} of the merging firms. Hence, the different dividend tax rates $t_{bd} > t_{ad}$ endow the shareholders of the target firm with Pareto-optimal wealth positions.

The gain apportionable to the shareholders of the acquired firm can be partially shared with the shareholders of the acquiring firm. The lower limit for the division of the gain is determined by the minimum exchange ratio α^* from the perspective of the shareholders of the acquired firm shown below, which leaves pre-merger wealth unchanged according to equation (59):

$$\alpha^* = \frac{C_{at}+(1-t_{ad})\delta_{at}}{(C_{at}+C_{bt})+(1-t_{ad})(\delta_{at}+\delta_{bt})}$$

$$\alpha^*\left[(C_{at}+C_{bt})+(1-t_{ad})(\delta_{at}+\delta_{bt})\right] = C_{at}+(1-t_{ad})\delta_{at} \qquad (30)$$

Due to $(1-\alpha)^* = 1-\alpha^*$ the exchange ratio for the shareholders of the acquiring firm results:

$$(1-\alpha)^* = 1-\frac{C_{at}+(1-t_{ad})\delta_{at}}{(C_{at}+C_{bt})+(1-t_{ad})(\delta_{at}+\delta_{bt})}$$

The inclusion of $(1-\alpha)^*$ into the comparison of the pre-merger wealth position with the post-merger wealth position ($P_{bt}^M - P_{bt}^P$) of the shareholders of the acquiring firm yields:

$$\Pi_b = \frac{C_{at}\delta_{bt}(t_{bd}-t_{ad})+C_{bt}\delta_{at}(t_{ad}-t_{bd})}{(C_{at}+C_{bt})+(1-t_{ad})(\delta_{at}+\delta_{bt})} \qquad (31)$$

Under $C_{at}\delta_{bt}(t_{bd}-t_{ad}) > C_{bt}\delta_{at}(t_{ad}-t_{bd})$, the gain attributable to the shareholders of the acquired firm Π_a according to equation (29) exceeds the maximum gain Π_b attributable to the shareholders of the acquiring firm which arises from an adjustment of the exchange ratio. Given the identical nominator $C_{at}\delta_{bt}(t_{bd}-t_{ad})+C_{bt}\delta_{at}(t_{ad}-t_{bd})$ in equation (29) and in equation (31) the reason for $\Pi_a > \Pi_b$ is the differentiating dividend tax rate in the denominator. Since $t_{bd} > t_{ad}$ the denominator according to equation (31) exceeds the denominator according to equation (29).

Π_a and Π_b provide the ultimate limits for an Pareto-optimal apportionment of the gain induced by dividend tax capitalization between the shareholders of the acquired and the acquiring firm. Depending on the relative bargaining power of the shareholders of the

acquired and the acquiring firm, any bargaining solution within the range of $\prod_a$ and $\prod_b$ which makes one group of shareholders better off without affecting the pre-merger wealth position of the other shareholder group is achievable.[xi]

Therefore, rational shareholders might not only impound their own dividend tax rate into share prices or that of potential acquirers of their shares in a taxable acquisition, but also partially the dividend tax rate of other lower-taxed investors holding shares in a firm that can merge tax-free with the firm of the shareholders with higher dividend tax rates.

The insight that dividend tax capitalization can yield merger gains also sheds light on the line of inquiry on dividend clienteles. Miller & Modigliani (1961) suggest that each firm has a distinctive body of shareholders characterized by its dividend tax rates. Firms paying small dividends attract shareholders who are heavily taxed on dividend distributions and who have a preference to receive corporate earnings by way of tax-favoured capital gains. Investors with lower dividend tax rates hold shares in high payout firms as they are less inclined to receive capital gains. Basically, each firm is assumed to have a dividend tax clientele which finds its dividend policy optimum.

Elton & Gruber (1970) conclude from this finding that a change in dividend policy might be costly for shareholders. From the perspective of at least one shareholder group a change in the dividend policy will occur following a corporate merger of firms with different dividend policies. Thus, a merger of firms with different dividend clienteles could be costly to shareholders due to dividend policy turning away from its optimality. However our paper proves that, under dividend tax capitalization, differences in tax rates may also be considered as a source of value which can be realized in connection with a merger.

6. Conclusion

Our analysis indicates the existence of a purely financial rationale for a corporate merger if dividend tax rates among the shareholders of target and acquiring firm are different. The source of the merger gain is the capitalization of taxes on dividend income. In a corporate merger investors can mitigate the implicit dividend tax liability capitalized into share prices. Following a corporate merger, lower-taxed shareholders may place a higher value on retained and future earnings which are taxable upon distribution than higher-taxed shareholders who considered these equity components in their pre-combination reservation prices. This revaluation proves to be Pareto-optimal, if the higher-taxed shareholders are compensated with contributed capital which is tax-free upon distribution. Therefore, a merger of firms with differently taxed shareholder groups might not be costly to investors as the research on dividend clienteles suggests. It may, in fact, prove to be synergistic.

Endnotes

[i] To distinguish between the shareholders of the merging firms we employ the definition “acquiring” and “acquired”, although it might be imprecise, if the merger takes place in terms of a combination, i.e. the termination of the merging firms and the formation of a one new firm or not entirely descriptive in cases of relatively equal sized participants.

[ii] Like Bradley, Desai & Kim (1988), we define synergy as a positive value gain to the shareholders of the combining firms which can be expressed as $\Delta\prod = \Delta p_a + \Delta p_b$, where

$\Delta\prod$ denotes the total synergistic gain, Δp_a the change in firm a shareholders` value, and $\Delta p_b$ the change in firm b shareholders` value.

[iii] Pareto improvement describes a change from one allocation of income to another which makes at least one individual better off without making any other worse off for a given set of alternative allocations. An allocation is Pareto-efficient or Pareto-optimal when no further Pareto improvements are possible.

[iv] Dividends are paid out of equity, so that $\partial BV_{it} / \partial d_{it} = -1$ which implies that $\partial P_{it} / \partial d_{it} = -1$ (before dividend tax capitalization).

[v] We refrain from taking into account investor arbitrage operating against the constraints to deduct capital losses against ordinary income (Stiglitz 1983).

[vi] This maximum purchase price determines the acquirer`s tax basis (B_{at}), which implies that $P_{at}^{max} = B_{at}$. Assuming the value of the shares is only affected by future dividend distributions yields $B_{at} = \sum_{\tau=1}^{\infty} R_f^{-\tau} E_t \left[d_{it+\tau} \right]$ before considering dividend taxes.

[vii] Even in case Θ equals 1, dividend tax capitalization may arise, if $t_{ad} > t_{ac}$, so that the tax deductibility of capital losses caused by stock trading or valuation allowance following dividend distributions does not compensate dividend taxation, which implies that $\left(1 - t_{ad} + t_{ac}\right) < 1$.

[viii] In the following we assume the capital gains tax regime to be entirely impure by equating $\Theta = 0$.

[ix] According to conventional wisdom shareholders will capitalize dividend taxes or capital gains taxes as both are alternative means to receive corporate earnings. Therefore, Dhaliwal, Erickson, Frank & Banyi (2003) are uncertain whether shareholders will capitalize dividend taxes into asset prices since capital gains provide another mechanism to distribute earnings. However, equation (7) is consistent with Collins & Kemsley (2000), who previously recognized that capital gains taxes constitute a 3rd layer of taxes besides corporate and dividend taxes under an impure capital loss tax regime.

[x] The finding of Harris & Kemsley (1999) and Harris, Hubbard & Kemsley (2001) that contributed capital on the one hand and retained and future earnings on the other hand have different valuation implications is supported by Eades, Hess & Kim (1984). In their ex-dividend study they report that share price declines of distributions of contributed capital exceed that of retained earnings and thus indicate that corporate earnings are valued less per unit than paid-in equity.

[xi] Barnes, Chakravarty & Haslam (1990) state bargaining power to act as the basis for the apportionment of merger induced synergies.

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