

# DISCUSSION PAPER SERIES

No. 6005

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*FINANCIAL ECONOMICS*



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# DIRECT EVIDENCE OF DIVIDEND TAX CLIENTELES

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Discussion Paper No. 6005  
December 2006

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CEPR Discussion Paper No. 6005

December 2006

## ABSTRACT

### Direct Evidence of Dividend Tax Clienteles\*

We study a large data set of stock portfolios held by individuals and organizations in the Swedish stock market. The dividend yields on these portfolios are systematically related to investors' relative tax preferences for dividends versus capital gains. Tax-neutral investors earn 40 basis points higher dividend yield on their portfolios than investors which face higher effective taxation of dividends than capital gains. We conclude that there are dividend tax clienteles in the market. We also argue that the abundant portfolio holdings by closely-held corporations, despite triple taxation at a combined marginal tax rate as high as 77.5%, is a consequence of taxation.

JEL Classification: G11 and G35

Keywords: capital gains tax, dividend tax clienteles, stock ownership and tax incidence

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\* We are grateful for institutional information from Ingrid Eriksson, Kerstin Nilsson, Viveca Scherman Johansson, and Per Swanström of Skatteverket, Kristina Melzén, Marie Rosvall of Försäkringsföreningen, Lina Sjöström, Krister Swaretz, and Stig Westman of Föreningssparbanken, Jan Bjuvberg, Håkan Thorsell, and Filip Wijkström of the Stockholm School of Economics, Svante Johansson of Carnegie Investment Bank, Johnny Larsson of Statistics Sweden, Roger Pettersson of RPA Försäkringsmäkleri, Sune Rydqvist of Configura, Ingmarie Severien of Handelsbankens forskningsstiftelser, and Bo Winnerfeldt of the Nordic Central Securities Depository. We also want to thank for comments by seminar participants at Binghamton University, Helsinki School of Economics, Ministry of Finance, New University of Lisbon, Norwegian School of Economics, Norwegian School of Management, Ohio State University, Renselaer Polytechnic Institute, Royal Institute of Technology, Swedish Institute for Financial Research, and University of Maastricht. Financial support from the Bank of Sweden Tercentenary Foundation, and Johan och Jakob Söderbergs stiftelse is gratefully acknowledged.

Submitted 17 November 2006

# 1 Introduction

Corporations pay dividends and investors pay taxes on these dividends. Investors also pay taxes on capital gains when they sell their shares, but they can choose when to do so. Some investors are tax neutral, and other pay taxes on dividends but not on capital gains. Theory suggests that investors can reduce the overall tax bill by sorting themselves into clienteles in which low-tax investors collect the dividends and high-tax investors realize capital gains.<sup>1</sup> Understanding how the differential taxation of dividends and capital gains influences investors' stock portfolios has implications for the pricing of financial securities, for corporations issuing securities, and for governments collecting taxes.

There is a large literature that examines the tax clientele hypothesis with indirect measures. One strand of the literature examines the price and volume patterns around the ex-dividend day. Elton and Gruber (1970) argue that the patterns of ex-dividend day returns are consistent with tax clienteles in the stock market, while Kalay (1982) and Boyd and Jagannathan (1994) challenge this interpretation.<sup>2</sup> A second strand relates stock returns and dividend yields. A return premium on high-yield stocks would induce low-tax investors to hold high-yield stocks and high-tax investors to hold low-yield stocks. Several studies run cross-sectional regressions of returns on dividend yields, but reach different conclusions (see, for example, Black and Scholes (1974), Litzenberger and Ramaswamy (1979), Miller and Scholes (1982)). A third strand of the literature examines institutional ownership. Del Guercio (1996) and Grinstein and Michaely (2005) find that institutions prefer dividend-paying stocks, and Michaely, Thaler, and Womack (1995) and Dhaliwal, Erickson, and Trezevant (1999) document changes in institutional ownership around dividend initiations and omissions. These studies are often inconclusive on tax effects because the tax status of institutional investors cannot be determined.

There are also direct tests of the tax clientele hypothesis. Lewellen, Stanley, Lease, and Schlar-

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<sup>1</sup>See, for example, Miller and Modigliani (1961), Brennan (1970), Litzenberger and Ramaswamy (1979), and Allen, Bernardo, and Welch (2000).

<sup>2</sup>The core of the critique is that investors with different marginal tax rates trade around the ex-dividend day until prices reflect transaction costs rather than tax rates. Trading would mitigate the need for forming tax clienteles, but the evidence suggests that relatively small amounts of stocks are traded, usually less than 1% of the stock (see, for instance, Michaely and Vila (1996)).

baum (1977) and Pettit (1977) study the stock portfolios of 2,500 individual investors from a retail brokerage house. Both studies relate dividend yields to proxies for marginal tax rates, but reach opposite conclusions. Scholz (1992) looks at self-reported data by 4,000 individuals in the Survey of Consumer Finances and finds evidence consistent with dividend tax clienteles. Most recently, Graham and Kumar (2006) report that high-age, low-income individuals invest more in high-yield stocks using a data set of 60,000 individual investors. These studies suffer from two weaknesses: Data include small subsets of individuals and no organizations, which own most shares, and the marginal tax rate of individuals is difficult to estimate.

We study the tax clientele hypothesis using stock ownership data from Sweden. The data set is comprehensive; it includes more than 34,000 stock portfolios held by organizations and two million stock portfolios by individuals. The tax structure is ideal for estimating tax clientele effects: Tax rates are flat and variation across investors arises mainly from different tax treatments of organizations. There are three tax clienteles in the Swedish stock market. First, individuals are taxed at the 30% rate and businesses at the 28% rate. These investors prefer capital gains over dividends because tax on capital gains can be postponed. Second, many organizations such as Government entities, insurance companies, charities, and pension funds are tax neutral. Relative to individuals and businesses, tax-neutral investors prefer dividends. Third, the taxation of investment funds is asymmetric: Dividends pass through and are taxed by the recipient, while capital gains accrue tax free within the fund. This means that investment funds have a stronger preference for capital gains over dividends than any of the other investors. In this tax environment we provide the following main results:

- Tax-neutral investors earn higher dividend yields on their portfolios than businesses, individuals, and investment funds. The difference is large; tax-neutral investors earn 40 basis points higher dividend yield on their portfolios than investment funds.
- More than 28,000 stock portfolios are held by corporations despite that income on such portfolios is subject to triple taxation. We argue that the existence of these portfolios is a consequence of taxation.

We conclude that there are dividend tax clienteles in the Swedish stock market. This result is not a

priori obvious. Shareholders trade off taxes against diversification, and a plausible null hypothesis is that the benefits of portfolio diversification swamp the benefits from reducing the tax bill.<sup>3</sup> Our finding of tax clientele effects in the Swedish stock market adds to a broader tax literature, which examines the trade-off between taxes and risk-taking across asset classes (see Poterba and Samwick (2002) and references). For example, the formation of tax clienteles across stocks and bonds is central to the capital structure theory of Miller (1977).<sup>4</sup> If there are tax clientele effects in the stock market, where the benefits of diversification ought to be the strongest, then tax clienteles are also likely to form across assets where the diversification benefits are weaker.<sup>5</sup>

The rest of the paper is organized as follows. Section 2 explains the relevant details of the Swedish tax code. Descriptive statistics for the sample stock portfolios and the empirical results are reported in Section 3. The curious phenomenon of corporations that hold stock portfolios is analyzed in Section 4. Section 5 concludes the paper and points to directions for future research.

## 2 Institutional Background & Data

### 2.1 Data

We study Swedish exchange-listed firms in the period 2001–2005. Financial data are taken from Thomson Financial and the Stockholm Stock Exchange. Descriptive statistics on the sample firms and their payout policies are displayed in Table 1. The two top rows present that the number of firms varies between 254 and 288 per year and the market capitalization between SEK 1,760 and 2,802 billion.<sup>6</sup> The rest of the table provides statistics on dividends. Dividends are paid annually after the approval of the shareholder meeting. Approximately 50% of the listed firms pay dividends, but the market value of the dividend-paying firms is more than 80% of market

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<sup>3</sup>Miller and Scholes (1978) propose the hypothesis that investors can offset dividend tax liability entirely by borrowing to purchase the stock portfolio and deduct the dividends against the interest rate payments on the loan. Whether such tax avoidance strategies are being used depends on the investor’s tolerance towards the risk of the levered stock portfolio.

<sup>4</sup>See also Auerbach and King (1983) who extend Miller’s (1977) model of tax tradeoffs to also include risk.

<sup>5</sup>For example, the persistent spread in bond yields between regular treasury securities and tax-exempt municipal bonds suggests that there are tax clienteles in the bond market where the benefits from diversification are smaller than in the stock market (see, for example, pages 340-345 in Sundaresan (2002)).

<sup>6</sup>The SEK/USD exchange rate has varied between 6.5 and 10.5 during the sample period.

capitalization. The aggregate dividends between 2001 and 2004 are approximately SEK 60 billion, which implies dividend yields between 2% and 3.5%. In 2005 there is a general increase in dividends (to about SEK 90 billion), but the dividend yield is similar to earlier years (3.1%). In addition to the dividends, approximately 10% of the Swedish firms repurchase shares through open market purchases. However, they are small relative the dividends and not considered in the paper. The data are generally skewed: The market value of the ten largest firms is more than 50% of stock market capitalization; ten firms pay more than 50% of aggregate dividends; and the market share of the 50 largest investors is almost 50% of stock market capitalization.

Ownership of Swedish listed stocks is organized as book entries by the Nordic Central Securities Depository (NCSD). Regulations require that exchange-listed firms use the securities depository for registration of stock ownership.<sup>7</sup> Each investor or custodian bank must have an account in the securities depository. According to law, a complete ownership record of all domestic shareholders must be established on the last bank day of June and December each year. The law requires Swedish banks to reveal the identities of the owners of all shares held in custody, but foreign banks do not have to report the nominee identity.

We obtain ten cross-sections of stock ownership for June and December each year in 2001-2005, but will in the empirical work use annual cross-sections (the June record). Each record displays the name of the shareholder, an organization identification number, the number of shares held, and a security identification code. The formation of individual stock portfolios can be based on the organization number for organizations and the name for individuals and proprietorships for whom the identification numbers have been omitted. The foreign stock portfolios are eliminated, because we do not know the identity of the beneficial owner of shares in custody.

With the data from Thomson Financial we compute factor loadings (betas) in one and three factor regression models and idiosyncratic risks as the standard deviations of the residuals from the same regressions. The betas capture exposures to the market, high-minus-low book-to-market ratios (HML), and small-minus-big market capitalization (SMB). These measures will be used as firm characteristics and later proxy for the investors' investment opportunities. We also consider

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<sup>7</sup>Some non-listed firms and bond issuers also use the securities depository for record keeping. The bond ownership data in the securities depository are confidential.



two liquidity variables, turnover rate (total trading in a stock relative its market capitalization) and spread (bid-ask spread in relation to its price), obtained from the Stockholm Stock Exchange. We further collect information on a firm’s use of dual class shares and whether individuals holdings in a firm’s shares are exempt from a wealth tax, or not. These data are later used to capture dimensions beyond taxes that may be important for investors’ portfolio holdings.

## 2.2 Taxation of Dividends and Capital Gains

Stock ownership generates dividends and capital gains. Dividends are taxed when they are paid and capital gains when the investor sells the stock to another investor in the secondary market or back to the firm in a share repurchase. This section explains how Swedish investors are taxed on dividends and capital gains. The tax rules have remained largely unchanged since 1991.

**Individuals.** Ordinary income and investment income are taxed as separate income classes. Ordinary income is subject to a progressive tax schedule. The average tax rate in the highest income bracket is 67.2%.<sup>8</sup> Dividends and capital gains are taxed as investment income at the 30% rate. Capital loss on stocks is deductible against other income, but loss limitations apply.<sup>9</sup> Estates are taxed as individuals and all tax obligations of the deceased individual are passed on to the estate.

**Businesses.** Investment income is lumped together with operating income and taxed at the 28% rate. Capital loss is fully deductible; it can be carried forward indefinitely, but cannot be carried back. Intercorporate dividends and capital gains are tax free if the ownership fraction of the voting rights exceeds 25% up to 2003 and 10% thereafter.<sup>10</sup> Business taxation applies to corporations,

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<sup>8</sup>The marginal tax rate on ordinary income is

$$1 - \left( \frac{1}{1.3246} \right) (1 - 0.566) = 0.672,$$

where 32.46% is the social security tax rate and 56.6% is the sum of the local tax rate (average of 31.6%) and the state tax rate (25% for income above SEK 465,200 in 2005).

<sup>9</sup>Capital loss on stock is fully deductible against capital gains on other stocks, but only 70% against other investment income. Negative investment income can also offset tax liability on ordinary income. The tax reduction is 30% times the deficit up to SEK 100,000 and 21% times the deficit above SEK 100,000. This means that capital loss saves taxes at rates 30% (gains on stock), 21% (investment income, ordinary income up to the limit), and 14.7% (ordinary income above the limit).

<sup>10</sup>Morck (2005) documents similar tax rules in most developed countries except the US where inter-corporate dividends are taxed for the explicit reason to discourage the formation of business groups.

associations, and foundations, but a variety of business organizations are not taxed this way. In the first group of business organizations, tax is levied on imputed income:

- Life insurance companies and pension funds: Income is defined as the average treasury rate during the year times the market value of the stock portfolio in the beginning of the year. The tax rate on imputed income is 15%.
- Banks and brokerage houses: Stocks can be held only for trading purposes. Income is defined as the change in the market value of the inventory (mark-to-market principle). The tax rate is 28%.

In the next group of business organizations, income passes through to the owners:

- Investment funds: Dividends pass through and are taxed as investment income by the recipients. Capital gains accrue tax free within the fund. Fund owners pay capital gains tax when they sell shares in the fund. These tax rules mean that short-term trading profits for the fund are transformed into long-term trading profits for the investor. This tax benefit comes at the expense of a tax on the net asset value of the stock portfolio similar to the taxation of life insurance companies and pension funds.
- Partnerships: Income from a stock portfolio passes through and is taxed as ordinary income by the partners. The transformation of investment income into ordinary income discourages individuals from owning stock through a partnership as the marginal tax rate on ordinary income (67.2%) is much higher than that on investment income (30%). For a business partner the transformation makes no difference as the tax rate is 28% in either case.
- Sole proprietorships: Income from a stock portfolio passes through and is taxed by the proprietor as investment income (30% rate). Stock clubs are taxed this way.

**Government Entities, Charities, and Non-Profits.** Government entities are exempt from taxation. Charitable organizations are exempt from taxation of investment income. Other non-profit organizations are taxed as businesses (see above).

## 2.3 Tax Preferences

Let  $\tau_d$  and  $\tau_g$  be the marginal tax rates on dividends and capital gains, respectively. We compute the relative tax preference for dividends over capital gains for all investors and identify three tax clienteles, sorted from high to low:

$$\theta = \frac{1 - \tau_d}{1 - \tau_g} = \begin{cases} 1.00 & \text{A. Tax-neutral investors} \\ 0.85 & \text{B. Businesses and individuals} \\ 0.70 & \text{C. Investment funds} \end{cases} \quad (1)$$

Life insurance companies, pension funds, banks, government entities, and charities are tax neutral. Life insurance, pension funds, and banks are tax neutral, because they are taxed on imputed income. Tax-neutral investors have the strongest relative preference for dividends, businesses and individuals fall somewhere in between, and investment funds have the strongest relative preference for capital gains. In equation (1) and what follows, we ignore the small difference in marginal tax rates between businesses and individuals and assume it is 30%. The numerical value for businesses and individuals depends on the value of deferral of capital gains tax. Bailey (1969) estimates the value of deferral to 50% of the statutory rate, Protopapadakis (1983) finds estimates in the order of 25%, and Chay, Choi, and Pontiff (2006) find it to be 55%.<sup>11</sup> Green and Hollifield (2003) model the advantage of deferral and find numerically that the effective tax rate on capital gains amounts to approximately 60% of the statutory rate. In equation (1), we apply the numerical result of Green and Hollifield (2003), so that  $\tau_g = 0.60 \times 30\% = 18\%$ .

The pass-through tax treatment of stock income from partnerships and investment funds means that tax preferences depend on the identities of partners and fund owners. In equation (1) we include investment funds and exclude partnerships. The asymmetric treatment of the two organizations is based on the belief that investment funds are primarily owned by individuals, while partnerships

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<sup>11</sup>Much of the US literature assumes that the effective capital gains tax rate is 25% of the statutory rate (e.g., Graham (2003)). This is based on Bailey (1969), who multiplies the estimated value of deferral 50% with the estimated value of the option to reset the cost basis to the market value at death, which is also 50%. We do not follow this approach because the Swedish tax code does not allow the estate to reset the cost basis to market values at death (see above).

may have individual as well as institutional partners.<sup>12</sup> Without information on the ownership structure, we think that the inclusion of partnerships only adds noise, and therefore exclude them from the analysis. Mutual funds also manage tax-deferred accounts for individuals under the Premium Pension Authority (PPM). We ignore this ambiguity about the tax status of investment funds, because the new pension system that started in 2000 is relatively small.

The calculations in (1) assume that investors have taxable income. If investors can offset dividends and capital gains against capital losses, the relative tax preferences change somewhat. Loss deductions are irrelevant for tax-neutral organizations and investment funds. Businesses become tax neutral, while individuals still prefer dividends as a result of loss limitations (see footnote 9). We assume that investors make long-term investments and ignore the possibility that businesses and individuals may want to re-balance their portfolios when they have capital losses.

## 2.4 Identification of Investor Tax Preferences

Statistics Sweden classifies organizations by a two-digit code for organizational form, which we use to sort investors into tax clienteles. The organization code was originally created to facilitate the exchange of information in the public sector. The tax administration uses the code to distribute the appropriate tax form to each organization. Table 2 presents the organization type, the tax form number, and our inference on the organization's tax status. There are 21 different organizations including individuals in the table. The tax status is unambiguous for the 12 organizations in the top of the table. Additional information is required to classify the tax status of the five organizations in the middle of the table. The last four organizations in the bottom of the table are not studied.

For the five organizations with ambiguous tax status, the name uniquely identifies life insurance (A), property and casualty insurance (B), pension funds (A), and closed-end funds (C). Brokerage houses (A) are identified by the register of the Swedish Association of Stock Brokers, and controlling shares (A) by the 10% and 25% ownership cutoffs. Non-profit organizations must file a tax return each year. The local tax officer decides whether the organization is charitable and qualifies for tax-exempt investment income (A) or the organization is subject business tax-

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<sup>12</sup>For a partnership, the tax preferences are 0.657 (individuals), 0.865, (businesses), and 1.000 (tax neutral) and, for an investment fund, 0.700 (individuals), 0.720 (businesses) and 1.000 (tax neutral).

ation (B). We classify non-profit organizations with charitable-related names as tax exempt (A) and non-profit organizations with names related to a specific group of people as businesses (B). Foundations are harder to classify than associations as they are typically named after the donor. A few scientific foundations (A) are well-known to the authors. Foundations with a relationship to a business are classified as taxed (B). The name method classifies 88% of the associations and 29% of the foundations. Non-classified non-profit organizations are not considered.

### 3 Empirical Results

We evaluate the tax effects in the cross-sections of stock portfolios. We first consider the portfolios of aggregate investors and then the portfolios of individual investors. The data set is less suitable for time-series analysis, so we do not report any results relating to clientele shifts around dividend initiations and omissions or new stock listings and delistings.

#### 3.1 Aggregate Investors' Portfolios

The starting point of our analysis is the Capital Asset Pricing Model extended with taxes by Brennan (1970), Litzenberger and Ramaswamy (1979), and Allen, Bernardo, and Welch (2000). In these models, if investors are sufficiently risk averse, the tax effects are negligible and investors hold approximately equal shares of all stocks in the market portfolio. This is our null hypothesis, which we evaluate against the alternative that tax-neutral investors (A) tilt their portfolios towards dividend-paying stocks, that investment funds (C) tilt their portfolios away from dividend-paying stocks, and that businesses and individuals (B) fall somewhere between the two extremes.

To test these hypotheses, we construct the aggregate stock portfolios of all investors that belong to tax clientele  $k = A, B, C$ . Table 3 presents summary statistics of variables averaged over the years in the sample. Consistent with the tax clientele hypothesis, the dividend yield on the tax neutral portfolio (A) is higher than the dividend yield on the portfolio of business and individuals (B) which, in turn, is higher than the dividend yield on the portfolio of investment funds (C). The yield spread between tax-neutral portfolios (A) and investment funds (C) is 40 basis points. The aggregate stock portfolio of tax-neutral investors (A) has the largest weight in dividend-paying stocks, but

the weight of businesses and individuals (B) falls below that of investment funds (C). There are more than two million stock portfolios with a combined market share of 64%. Businesses and individuals hold most of the two million portfolios, but their market share is only 21.4%. Foreign investors own 33.9%. The foreign stock portfolio earns the lowest dividend yield. Unclassified investors include associations and foundations with unknown tax status, domestic organizations with unknown type, and partnerships. The insignificant market share of partnerships, less than 0.05%, is consistent with tax incentives which discourage individuals from holding stocks through partnership.

For each tax clientele  $k$ , we compute the percentage ownership fraction  $F_{jt}^k$  in firm  $j$  in year  $t$ , and estimate a pooled cross-section, time-series, linear regression model of the ownership fraction on a dividend dummy variable  $D_{jt}$ , which equals one if the firm pays dividends and zero otherwise, and a set of firm-specific control variables  $X_{jt}$ :

$$F_{jt}^k = \beta_{0t}^k + \delta^k D_{jt} + \beta^{k'} X_{jt} + \varepsilon_{jt}^k, \quad k = A, B, C. \quad (2)$$

The  $\delta^k$  parameter captures, conditional on the firm characteristics  $X_{jt}$ , the over- or under-weighting in dividend-paying stocks of clientele  $k$ . Under the null hypothesis that the aggregate investors hold equal market shares across firms, the coefficients of the dividend dummy are all zero. The alternative hypothesis predicts that the coefficients can be sorted according to tax preferences:

$$\delta^A > \delta^B > \delta^C. \quad (3)$$

The regression is equally-weighted which is correct under the null hypothesis that the ownership fractions are equal across firms. The regression does not include a dummy variable for share repurchases, because the tax consequences are the same for share repurchase and zero payout. The general study of payout policy may offer different implications for dividend-paying and repurchasing firms, but analyzing these differences is outside the scope of our paper.

The regression results are reported in Table 4. Each panel presents three model specifications for various combinations of variables which control for investor risk preferences. Standard errors

are reported below the coefficients. The standard errors reported throughout the paper are based on a pair wise bootstrap (500 replications) accounting for conditional heteroskedasticity and serial correlation. Asymptotic standard errors from a GMM estimation, also accounting for conditional heteroskedasticity and serial correlation, are very similar to the bootstrap standard errors and are therefore not reported in the tables.

For each tax clientele, the coefficients of the dividend dummy variable are similar across model specifications. Across tax clienteles, all regression coefficients in Panels A and C have the opposite sign of those in Panel B. By construction, the coefficients in each row sum to 100% when the missing portfolio data are included. The coefficients are generally statistically different from zero at conventional levels. The coefficient of the dividend dummy is positive for tax-neutral investors (A) and investment funds (C). These portfolios are tilted towards dividend-paying stocks by approximately seven and five percentage points, respectively. For businesses and individuals (B) the coefficients are negative and suggest that these investors tilt their portfolios away from dividend-paying stocks by about ten percentage points. Consistent with the tax clientele hypothesis (3), tax-neutral investors display a stronger preference for dividend paying stocks than any of the other tax clienteles. The differences between tax neutral investors (A) and any of the other tax clienteles are statistically significant at usual significance levels. However, inconsistent with the tax clientele hypothesis (3), the coefficients for investment funds (C) are larger than those of businesses and individuals (B). These differences are also statistically significant.

Missing control variables may explain the mixed evidence for the tax clientele hypothesis. For example, investment funds may be bound to a diversification strategy which forces them to stay close to the market portfolio. Swedish index funds have no choice but to hold the market portfolio and, by construction, the largest investment funds cannot deviate much from the market portfolio. The five largest investment funds hold together more than 10% of the stock market capitalization. Businesses and individuals are small and have no commitment to diversify across stocks.

## 3.2 Individual Investors' Portfolios

### 3.2.1 Descriptive Statistics

The aggregate statistics in the previous section hide significant investor heterogeneity. Table 5 presents averages of portfolio characteristics for major investor types. In addition to the organizations in Table 2 above, we have classified corporations as widely-held if the firm itself or the parent of the business group to which the firm belongs is registered in the securities depository, or as closely-held if the firm or the parent is outside the securities depository. The intercorporate ownership structure is taken from the database Market Manager.

The variation in average portfolio size across investor types is noticeable. Life insurance companies hold the largest portfolios with almost 50 stocks. Closed-end funds are also very large, but they hold only 10 stocks. Mutual funds, non-life insurance companies, the public sector, and banks hold medium size portfolios with approximately 20 stocks. Pension funds, charities, and non-profits hold smaller portfolios with less than 10 stocks. We only consider investors' direct investments in domestic stocks and do not have information on the number of foreign stocks they hold. Adding the foreign stocks would most likely increase the number of stocks held by mutual funds and pension funds.

The smallest portfolios are held by closely-held firms and individuals with only three stocks. The small number of directly owned stocks in individuals' portfolios is also a striking feature of the Survey of Consumer Finances (see Polkovnichenko (2005)). Calvet, Campbell, and Sodini (2006) find that Swedish individuals diversify through ownership of mutual funds. Individual investors dominate our sample with more than two million stock portfolios of which approximately one million consist of only one stock with a tiny market value below SEK 15,000. More than 600,000 such one-stock portfolios are invested in one of three stocks (Ericsson, Telia-Sonera, and Föreningssparbanken). The small aggregate market share of individuals in the amount of 14.5% is in line with 7.2% and 16.5% reported for Finland and the UK, respectively.<sup>13</sup> Aggregate ownership by individuals in the US stock market is not available.<sup>14</sup>

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<sup>13</sup>See Karhunen and Keloharju (2001) and Bell and Jenkinson (2002) for evidence in Finland and the UK, respectively.

<sup>14</sup>The Federal Reserve's Flow of Fund Accounts of the US present the aggregate ownership of various financial



The variation in the risk characteristics across investor types is noticeable. Large stock portfolios held by institutional investors are tilted towards stocks with high dividend yield and high book-to-market ratios (small negative HML coefficients). Small stock portfolios held by closely-held corporations display the opposite traits. They are tilted towards stocks with low dividend yield and low book-to-market ratios (large negative HML coefficients). Estates and stock clubs also follow this investment strategy. We report the frequency distribution of the HML betas, the number of stocks, and the portfolio values in Figures 1–3. The distributions are displayed for each tax clientele, where clientele B is further divided into B1 (Businesses) and B2 (Individuals). There is a striking tendency for businesses to hold stocks with low HML betas. The dominance of few stocks in portfolios held by businesses and individuals is also apparent, as is the higher portfolio values for investment funds.

### 3.2.2 Regression Results

The individual stock portfolio data described above are significantly different from the predictions of the Capital Asset Pricing Model. Regressing individual ownership fractions on a set of explanatory variables is also statistically difficult. For example, the many single-stock portfolios would appear with the portfolio weight of 100% in one stock and 0% in all other stocks. Instead, we follow the approach of Pettit (1977), Scholz (1992), and Graham and Kumar (2006) and define the portfolio dividend yield as the dependent variable. The idea is that preferences, beliefs, and budget constraints determine the optimal portfolios, which are associated with a dividend yield. Under the null hypothesis that tax effects are negligible, the dividend yield should be equal across investors. The tax clientele hypothesis, on the other hand, implies that the average dividend yield is higher for tax-neutral portfolios than for investment funds, and that the dividend yields on business and individual portfolios fall somewhere between the two extremes.

For each investor  $i$  in year  $t$ , we compute the dividend yield  $Y_{it}$  and estimate a pooled cross-section, time-series, linear regression model of the dividend yield on dummy variables  $D_{it}^k$  for each

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institutions in their Table L.213. The residual that is referred to as the household sector bundles the ownership of individuals, businesses, and non-profit organizations.

tax clientele and a set of control variables  $X_{it}$ :

$$Y_{it} = \beta_{0t} + \gamma^B D_{it}^B + \gamma^C D_{it}^C + \beta' X_{it} + \varepsilon_{it}. \quad (4)$$

The tax clientele hypothesis implies that:

$$0 > \gamma^B > \gamma^C. \quad (5)$$

We also estimate a regression where we replace the tax clientele dummies with the tax preference parameter  $\theta_{it}$  for each investor  $i$  in year  $t$ :

$$Y_{it} = \beta_{0t} + \gamma\theta_{it} + \beta' X_{it} + \varepsilon_{it}. \quad (6)$$

For this specification, the tax clientele hypothesis predicts that  $\gamma > 0$ .

The characteristics of individuals' stock portfolios are markedly different from those of organizations (see Table 5 above). Adding more than two million stock portfolios to an equally-weighted regression means that the coefficients of the control variables, but not the tax variables, are determined by the characteristics of the average individual's stock portfolio. We therefore report the results from estimating regression models (4) and (6) without the stock portfolios of individuals. In the next sub-section we comment on the regression results when individuals' portfolios are included.

The main regression results are reported in Table 6. Specifications 1a, 2a, and 3a refer to regression equation (4) and specifications 4a and 5a refer to equation (6). The tax clientele dummies enter with negative signs and the tax preference parameter with a positive sign. All coefficients are statistically different from zero. In specification (1a), the coefficients of businesses (B) are more negative than the coefficient of investment funds (C). This result mimics those on aggregate portfolio data above. In specifications (1b) and (1c), the coefficients of the tax clientele dummies are nicely sorted according to tax preferences (5). The magnitudes are economically meaningful. The yield spread between A and C is in the order of the unconditional average 40 basis points. Consistent with Pettit (1977), dividend yield decreases with market beta and, as in Graham and

Kumar (2006), dividend yield increases with HML beta and decreases with idiosyncratic risk.

### 3.2.3 Robustness

The bottom of Table 6 presents that 29.9% of the portfolios are clustered at a zero dividend yield, which means that the coefficients in a linear model may predict negative dividend yields. We examine the sensitivity to the clustering at zero by trimming the sample (Table 7) and by estimating a Tobit model (Table 8). Since zero-yield portfolios are most common among investors with only a few stocks, we expect the problem to be most critical for the estimation of the coefficients of businesses (B).

The left panel in Table 7 excludes portfolios with less than five stocks, the middle panel portfolios with a market value below SEK 250,000, and the right panel portfolios of businesses (B). The number of observations and the percentages of zeros decrease dramatically. In all three panels the signs of the coefficients are the same as in the full sample. The magnitude of the coefficients for investment funds (C) is about the same, while the coefficients for businesses (B) are smaller.

Table 8 presents results from a Tobit estimation. The top panel reports the estimated coefficients with standard errors. The results are similar to those using trimmed samples. The bottom panel evaluates the differences in expected yield spreads due to differences in relative tax preferences at the averages of the control variables for tax-neutral investors.<sup>15</sup> The resulting yield spreads are similar to those reported in Table 7. One tax coefficient is positive, but not statistically different from zero. In sum, the portfolios held by tax-neutral investors present a robust significant difference in dividend yields relative investment funds, whereas the differences relative portfolios held by businesses are sensitive to the empirical specification.

Many variables can influence investors' portfolio choices. Above, we attempt to control for investors' trade-off between risk and return. We have also examined two measures of liquidity, turnover rate and bid-ask spread, but they do not change the results significantly.

We may have left out variables which only influence the stock portfolios of individuals. For example, employees may own stock in their own company as a part of an incentive package, found-

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<sup>15</sup>Computing differences in expected yield spreads at the grand average or at averages of other investor clienteles give qualitatively and quantitatively similar results.

ing family members own stock in their own company by inheritance and for control purposes, and individuals may prefer stocks which are exempt from wealth tax. When we include individuals' portfolios, allowing for different coefficients on the control variables for individuals, we find very similar results as before. The tax coefficient on individuals is significantly negative, but the economic magnitude varies across different regression specifications. This indicates the difficulty in capturing the portfolios of individual investors.

Statutes sometimes restrict charities to make distributions from dividends only and not from realized capital gains or principal.<sup>16</sup> This variable cannot be constructed without the statutes of the non-profit organizations. However, the regression results without the foundations are similar.

## 4 Corporate Stock Portfolios

More than 28,000 portfolios are held by closely-held corporations (see Table 5). The average dividend yield on these portfolios is low (1.45%), average portfolio size is small (SEK 2.1 million), and the portfolios are tilted toward growth stocks as suggested by the low average HML betas (-1.03). Why do corporations buy growth stocks? We propose a tax-based explanation.

Special tax rules pertain to income from a closely-held corporation, where the owner (or his relatives) is also employed. The purpose of these rules is to tax labor income the same way regardless of whether it is earned directly as wages or channeled through a partnership or a corporation. The marginal tax rate on dividends from a closely-held corporation is 68.7%.<sup>17</sup> Together with the corporate tax of 28%, it implies that a dividend on a stock portfolio that passes through to its final owner is subject to triple taxation at a marginal tax rate of 77.5%. The taxation of capital gains from selling shares in the closely-held firm is more favorable. A capital gain which exceeds

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<sup>16</sup>An official at the local authority which supervises foundations (Tillsynsmyndigheten för stiftelser i Stockholms län) estimated that 30% of the foundations can only distribute dividends, especially older foundations, 20% can distribute dividends and realized capital gains, and 50% have no explicit restriction and can therefore make payments from its principal.

<sup>17</sup>The rules are complex and change frequently. A small dividend can be paid tax free. An additional amount, which depends on paid-in-capital and total wages paid to employees other than the owner, is subject to 30% investment income tax. The excess dividend is taxed as wage income at marginal tax rate 56.6%, but is not subject to social security tax. Therefore, the marginal tax rate on corporate income is

$$(1 - 0.28)(1 - 0.566) = 0.687.$$

approximately SEK eight million is taxed as investment income at the 30% rate.<sup>18</sup> A closely-held firm is not allowed to repurchase its own shares.

Corporations may hold a liquid stock portfolio for future investments in operating assets. Corporations may also hold stocks to offset pension liabilities for the employees. However, we conjecture that many corporate stock portfolios in our data serve as supplemental retirement accounts for the owners. A portfolio of growth stocks does not trigger any taxes before the owner sells the closely-held firm. Saving for retirement through a stock portfolio held by the firm has the advantage that the portfolio can be liquidated at any time and used for other purposes than retirement. This benefit must be weighted against the advantage of private pension and deferred compensation plans, which are protected by the limited liability of the corporation.<sup>19</sup> The data support the retirement hypothesis. Using data from Market Manager, we compute the ratio of the market value of the stock portfolio to the book value of total assets for financial and non-financial firms, respectively. Most financial firms are securities trading companies, while the non-financial firms span manufacturing, construction, trade, and service. Table 9 presents the distribution of the ratio. Since we are mixing market and book values, the ratio sometimes exceeds 100%. A number of firms have a significant part of their assets in stock portfolios. In 3,000 non-financial firms (or 13% of the firms), the ratio exceeds 50%. These firms are better characterized as closely-held stock funds than as operating firms. Importantly, when we divide the non-financial firms into firms with assets below and above SEK 2 million, we see that the result is not driven by the smaller firms in the sample. Also, the distributions are very similar across industries (manufacturing, construction, trade, and service). Note that investment-fund tax status does not apply to closely-held firms.

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<sup>18</sup>A capital gain below SEK eight million is taxed as half investment income (30% rate) and half ordinary income (56.6% rate).

<sup>19</sup>Social security is the basis for retirement in Sweden. Payments to private pension plans and deferred compensation plans are made after social security taxes, but before ordinary income tax. The maximum before-tax amount is SEK 39,300 per year for private pension plans and SEK 394,000 for deferred compensation plans. Accordingly, the stock portfolio has the additional advantages that there is no upper limit and social security taxes must not be paid.

## 5 Conclusions

We conclude that there are dividend tax clienteles in the Swedish stock market. The main supporting piece of evidence is the dividend yield spread between tax neutral stock portfolios (A) and investment funds (C). Theoretically, this is where we expect to find the strongest tax effect and the estimated yield spread in the order of 40 basis points is economically meaningful. The ambiguous ordering of business portfolios (B) is less supportive. In some econometric specifications, the average business portfolio sorts nicely between the average tax-neutral portfolio and the investment fund, but in other specifications, the business portfolios exhibit stronger dividend aversion than investment funds. Empirically, we cannot tell whether businesses choose high growth stocks with low dividend yield, because the owners of those businesses like growth stocks or because the business owners want to avoid taxes. The abundance of portfolios of closely-held corporations that invest in low-yield, growth stocks suggests that the owners of many business portfolios want to avoid taxes. Then, the empirical results regarding the tax clientele hypothesis are ambiguous, because we fail to properly control for the business owners' time preferences for growth stocks which, in turn, are related to the business owners' particular tax position.

We have studied the portfolio implications of the asymmetric taxation of dividends and capital gains in Sweden. While some feature of the Swedish tax code are specific, we believe that the two main tax asymmetries are general. First, businesses and individuals (B) prefer capital gains over dividends as a result of the realization principle. The alternative, the mark-to-market principle, is less common. Second, Swedish investment funds (C) prefer tax-free capital gains over taxed dividends. We believe this is a common tax treatment of investment funds in many countries, albeit not in the US. International stock portfolios are often taxed on dividends but not on capital gains. For example, a US pension fund that purchases Swedish stocks is subject to 15% withholding tax on dividends but 0% tax on capital gains. If US pension funds together with other institutional investors that are subject to similar tax treatment dominate the aggregate foreign stock portfolio, then the low dividend yield on the foreign stock portfolio is additional evidence of tax clienteles in the Swedish stock market (see Table 3). The composition of cross-border equity flows is a topic for future research.

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**Table 1: Firms and Dividend Payout**

	2001	2002	2003	2004	2005
Number of firms	288	280	276	265	254
Market value of firms	2,650	1,909	1,760	2,331	2,802
Number of firms paying dividends (in % of total)	159 (55.2)	141 (50.4)	138 (50.0)	141 (53.2)	146 (57.5)
Market value of firms paying dividends (in % of total)	2,465 (93.0)	1,674 (87.7)	1,511 (85.8)	1,851 (79.4)	2,663 (95.0)
Dividends	66.6	50.6	56.9	66.9	91.3
Dividend yield	2.04	2.02	3.45	3.06	3.15

The table presents summary statistics for the firms in the sample over the period 2001–2005. All values are reported in SEK billion. Dividend yields are reported in %.

**Table 2: Organization and Tax Status**

Organization	Tax form	Tax status	Classification method
Bank corporations	2	A	
Mutual savings banks	2	A	
Public sector	3	A	
Religious associations	3	A	
For-profit associations	2	B	
Condominium associations	2	B	
Common interest property	2	B	
Family foundations	3	B	
Individuals & sole proprietorships	1	B	
Estates	1	B	
Multi-person proprietorships	None	B	
Investment funds	2	C	
Insurance corporations	2	A,B	Life (A), non-life (B)
Mutual insurance companies	2	A,B	Life (A), non-life (B)
Other corporations	2	A,B,C	Control/trader (A), fund (C), other (B)
Other non-profit associations	3	A,B	Pension (A), name-based (A or B)
Other foundations & funds	3	A,B	Pension (A), name-based (A or B)
Partnerships	4	n/a	
Foreign institutions	2	n/a	
Other organizations	3	n/a	
Under investigation	2/3	n/a	

Tax form: Individuals (1), businesses (2), charities and non-profits (3), and partnerships (4). Tax status based on equation (1): Tax neutral (A), businesses and individuals (B), investment funds (C). Name-based classification: Tax neutral (A) if the organization name contains words associated with children, animal protection, nature, religion, scientific, education, defense, museum, sports, arts, music, culture, political party, and health care; Business taxation (B) if the organization name contains words associated with business activity, labor union, stock club, employee profit plan, and social club, or the association is named after a person or family.

**Table 3: Summary Statistics of Aggregate Investors**

	Dividend yield	Weight in dividends	Market value	Market share	Number of investors
A. Tax neutral	3.07	93.1	630.0	27.6	2,608
B. Businesses & individuals	2.72	86.0	488.7	21.4	2,079,517
C. Investment funds	2.67	88.3	346.4	15.1	365
A–C	2.86	89.6	1,465.1	64.0	2,082,490
X. Foreign investors	2.50	85.4	775.6	33.9	123,468
X. Unclassified	3.37	90.5	49.8	2.2	24,032
Total sample	2.74	88.2	2,290.5	100.0	2,229,990

The table presents statistics, averaged over years, for the aggregate tax clienteles in the sample. Market values are reported in SEK billion. Dividend yields and market shares are reported in %.

**Table 4: Regressions of Ownership Fractions on Firm Characteristics**

	A. Tax neutral			B. Businesses & individuals			C. Investment funds			X. Foreigners & Unclassified		
2001 dummy	11.075 (1.158)	16.079 (2.320)	16.003 (2.314)	55.374 (1.723)	52.253 (3.260)	52.841 (3.234)	7.054 (0.697)	7.656 (1.482)	7.067 (1.573)	26.497 (1.433)	24.012 (2.787)	24.089 (3.130)
2002 dummy	12.448 (1.132)	17.253 (2.172)	17.148 (2.195)	53.404 (1.639)	50.480 (3.159)	51.075 (3.106)	8.305 (0.724)	8.837 (1.430)	8.207 (1.502)	25.844 (1.358)	23.430 (2.793)	23.571 (3.014)
2003 dummy	11.550 (1.175)	16.307 (2.192)	16.187 (2.175)	54.161 (1.611)	51.265 (3.114)	51.879 (3.032)	8.896 (0.729)	9.424 (1.435)	8.778 (1.488)	25.393 (1.365)	23.004 (2.817)	23.156 (3.006)
2004 dummy	13.614 (1.264)	18.425 (2.277)	18.316 (2.271)	51.413 (1.711)	48.500 (3.115)	49.148 (3.101)	8.983 (0.705)	9.507 (1.435)	8.869 (1.485)	25.990 (1.388)	23.568 (2.777)	23.667 (3.064)
2005 dummy	13.485 (1.253)	18.420 (2.221)	18.324 (2.234)	50.428 (1.824)	47.351 (3.166)	47.994 (3.171)	8.380 (0.748)	8.972 (1.444)	8.347 (1.517)	27.707 (1.479)	25.256 (2.898)	25.335 (3.160)
Dividend dummy	10.611 (1.423)	7.639 (1.670)	7.303 (1.673)	-12.662 (1.917)	-9.879 (2.225)	-9.441 (2.402)	5.935 (0.840)	5.005 (1.051)	4.609 (1.015)	-3.884 (1.518)	-2.765 (1.887)	-2.471 (2.077)
Beta (Market)	0.573 (1.130)	0.819 (1.248)	0.819 (1.248)	-5.754 (1.683)	-5.938 (2.052)	-5.938 (2.052)	3.393 (0.741)	4.104 (0.817)	4.104 (0.817)	1.778 (1.593)	1.778 (1.593)	1.015 (1.660)
Beta (HML)			0.486 (1.493)			2.531 (2.379)			-1.144 (0.891)			-1.873 (2.053)
Beta (SMB)			-0.298 (1.456)			-1.470 (2.808)			-1.432 (0.999)			3.200 (2.270)
Idiosyncratic risk		-8.415 (2.449)	-8.236 (2.699)		16.120 (3.125)	17.518 (3.995)		-7.709 (2.092)	-7.326 (2.194)		0.004 (3.330)	-1.957 (4.145)
Adjusted R <sup>2</sup>	8.3	10.1	10.1	7.0	11.4	13.1	7.3	12.8	13.6	0.9	1.0	3.2
N	1,306	1,306	1,306	1,306	1,306	1,306	1,306	1,306	1,306	1,306	1,306	1,306

The table presents the results of pooled least square regressions of percentage ownership fraction on firm characteristics over 2001–2005, as in regression equation (2). The dividend dummy equals one if a firm pays dividends, and zero otherwise. The betas are the factor loadings in a market model regression or in a three factor model regression (market; high-minus-low book-to-market ratio, HML, or value-minus-growth; small-minus-big market capitalization, SMB). Idiosyncratic risk is the (annualized) standard deviation of the residuals from the same regressions. Standard errors based on a pairwise bootstrap (500 replications) accounting for conditional heteroskedasticity and serial correlation are reported in parenthesis. The adjusted R-squares in the regressions are reported in %. N is the total number of observations available.

**Table 5: Summary Statistics of Individual Investors**

	Average									
	Dividend yield	Weight in dividends	Beta (market)	Beta (HML)	Beta (SMB)	Idiosyncratic risk	Number of stocks	Value	Number of investors	Market share
<u>A. Tax neutral</u>										
Life insurance	2.84	88.8	1.05	-0.20	0.14	8.9	48.2	8,546.5	19	7.2
Control	3.15	67.0	0.82	-0.09	0.19	32.1	1.2	1,508.9	81	5.1
Banks & brokers	3.69	92.7	0.97	0.20	-0.16	13.4	15.7	408.7	115	2.0
Public sector	3.05	89.7	1.05	-0.14	0.10	10.6	19.2	1,408.2	150	9.2
Pension funds	2.24	74.0	1.14	-0.65	0.23	18.0	7.7	56.8	765	1.9
Church & charity	2.93	84.9	1.10	-0.30	0.14	14.5	8.3	34.8	1,478	2.2
<u>B. Businesses &amp; individuals</u>										
Non-life insurance	3.06	86.6	1.04	-0.19	0.08	12.3	15.0	239.4	121	1.3
Widely-held firms	2.12	63.3	1.05	-0.53	0.31	20.7	2.3	229.4	128	1.3
Associations & foundations	2.92	85.1	1.09	-0.28	0.13	14.9	7.3	30.8	1,216	1.7
Estates & stock clubs	1.48	52.4	1.14	-1.02	0.31	29.6	2.6	0.6	1,193	0.0
Individuals	2.45	79.3	0.96	-0.44	0.14	21.5	2.8	0.2	2,048,348	14.5
Closely-held firms	1.45	55.1	1.15	-1.03	0.31	27.5	3.7	2.1	28,511	2.7
<u>C. Investment funds</u>										
Closed-end funds	2.35	76.1	1.06	-0.08	0.23	20.0	10.2	6,323.0	17	4.6
Mutual funds	2.44	82.4	1.09	-0.31	0.17	11.2	24.7	696.9	348	10.6

The table presents the characteristics of portfolios held by investors in different tax clienteles. The averages are equally weighted over all investors and all years. Portfolio values are expressed in SEK million. The betas are the factor loadings in a three factor regression model (market; high-minus-low book-to-market ratio, HML, or value-minus-growth; small-minus-big market capitalization, SMB) and idiosyncratic risk is the (annualized) standard deviation of the residuals from the same regression reported in %. Dividend yields, portfolio weights in dividend-paying stock, and market shares are reported in %.

**Table 6: Dividend Yields and Tax Preferences**

	1a	2a	3a	4a	5a
2001 dummy	2.828 (0.028)	4.731 (0.025)	4.219 (0.039)	2.722 (0.104)	2.620 (0.108)
2002 dummy	2.355 (0.028)	4.344 (0.023)	3.823 (0.037)	2.335 (0.103)	2.224 (0.107)
2003 dummy	2.879 (0.028)	4.813 (0.023)	4.287 (0.036)	2.804 (0.104)	2.689 (0.106)
2004 dummy	2.677 (0.027)	4.575 (0.023)	4.049 (0.037)	2.566 (0.102)	2.451 (0.106)
2005 dummy	3.153 (0.027)	5.042 (0.023)	4.526 (0.037)	3.033 (0.102)	2.927 (0.106)
B. Businesses	-1.257 (0.027)	-0.303 (0.021)	-0.230 (0.020)		
C. Investment funds	-0.335 (0.045)	-0.592 (0.032)	-0.534 (0.033)		
Tax preference $\theta$				2.008 (0.116)	1.606 (0.113)
Beta (Market)		-1.031 (0.013)	-0.557 (0.022)	-1.031 (0.013)	-0.558 (0.023)
Beta (HML)			1.185 (0.009)		1.184 (0.009)
Beta (SMB)			0.297 (0.025)		0.297 (0.025)
Idiosyncratic risk		-0.029 (0.001)	-0.026 (0.001)	-0.029 (0.001)	-0.026 (0.001)
Adjusted R <sup>2</sup>	4.6	43.2	45.1	43.2	45.1
N	164,743	164,743	164,743	164,743	164,743
N <sub>0</sub>	29.9	29.9	29.9	29.9	29.9

The table presents the results of pooled least square regressions of dividend yield on portfolio characteristics over 2001–2005, as in regression equations (4) and (6). B. Businesses and C. Investment funds refer to dummy variables, which are equal to one if investor belongs to clientele B and C, respectively, and otherwise zero. Clientele B includes Businesses and excludes individuals. The tax preference  $\theta$  is defined as in expression (1). The betas are the factor loadings in a market model regression or in a three factor model regression (market; high-minus-low book-to-market ratio, HML, or value-minus-growth; small-minus-big market capitalization, SMB). Idiosyncratic risk is the (annualized) standard deviation of the residuals from the same regressions. Standard errors based on a pairwise bootstrap (500 replications) accounting for conditional heteroskedasticity and serial correlation are reported in parenthesis. The adjusted R-squares in the regressions are reported in %. N is the total number of observations available; N<sub>0</sub> is the number of observations with zero dividend yield expressed in % of total number of observations.

**Table 7: Dividend Yields and Tax Preferences in Trimmed Samples**

	Number of stocks $\geq 5$			Portfolio value $\geq$ SEK 250,000			Clienteles A and C only		
	1b	3b	5b	1c	3c	5c	1d	3d	5d
2001 dummy	2.530 (0.025)	4.724 (0.056)	3.883 (0.091)	2.718 (0.030)	4.245 (0.068)	3.026 (0.136)	2.369 (0.037)	4.583 (0.152)	2.793 (0.165)
2002 dummy	2.209 (0.024)	4.206 (0.052)	3.368 (0.089)	2.574 (0.029)	3.755 (0.065)	2.536 (0.134)	2.236 (0.034)	4.279 (0.149)	2.605 (0.158)
2003 dummy	3.495 (0.027)	4.907 (0.049)	4.074 (0.087)	3.610 (0.029)	4.552 (0.063)	3.334 (0.133)	3.399 (0.038)	5.096 (0.144)	3.306 (0.151)
2004 dummy	3.051 (0.024)	4.575 (0.051)	3.742 (0.089)	2.967 (0.030)	4.203 (0.067)	2.985 (0.133)	2.861 (0.040)	4.640 (0.150)	2.833 (0.160)
2005 dummy	3.202 (0.023)	4.827 (0.048)	3.992 (0.088)	3.202 (0.029)	4.527 (0.066)	3.309 (0.132)	3.011 (0.041)	4.864 (0.156)	3.051 (0.165)
B. Businesses	-0.642 (0.025)	-0.045 (0.016)		-0.837 (0.029)	-0.145 (0.025)				
C. Investment funds	-0.342 (0.037)	-0.457 (0.025)		-0.562 (0.044)	-0.504 (0.033)		-0.337 (0.044)	-0.559 (0.033)	
Tax preference $\theta$			0.887 (0.088)			1.247 (0.132)			1.800 (0.103)
Beta (Market)		-0.900 (0.045)	-0.909 (0.047)		-0.602 (0.043)	-0.605 (0.043)		-1.033 (0.139)	-1.033 (0.139)
Beta (HML)		1.568 (0.020)	1.560 (0.020)		1.323 (0.023)	1.318 (0.022)		1.450 (0.036)	1.450 (0.036)
Beta (SMB)		0.642 (0.048)	0.664 (0.046)		0.414 (0.053)	0.418 (0.054)		0.742 (0.106)	0.742 (0.105)
Idiosyncratic risk		-0.047 (0.001)	-0.046 (0.001)		-0.030 (0.002)	-0.029 (0.002)		-0.024 (0.002)	-0.024 (0.002)
Adjusted R <sup>2</sup>	12.1	54.5	54.3	5.8	41.4	41.4	4.9	41.4	41.4
N	44,426	44,426	44,426	74,513	74,513	74,513	14,865	14,865	14,865
N <sub>0</sub>	2.5	2.5	2.5	7.6	7.6	7.6	8.2	8.2	8.2

The table presents the results of pooled least square regressions of dividend yield on portfolio characteristics over 2001–2005. Specifications 1b, 3b, and 5b only include portfolios with five holding or more; specification 1c, 3c, and 5c only include portfolios with a market value of SEK 250,000 or more; specification 1d, 3d, and 5d only include tax clienteles A and C. The variables are defined as in Table 6. Standard errors based on a pairwise bootstrap (500 replications) accounting for conditional heteroskedasticity and serial correlation are reported parenthesis. The adjusted R-squares in the regressions are reported in %. N is the total number of observations available; N<sub>0</sub> is the number of observations with zero dividend yield expressed in % of total number of observations.

**Table 8: Dividend Yield and Tax Clienteles in a Tobit Model**

	1e	2e	3e	4e	5e
2001 dummy	3.037 (0.026)	5.761 (0.043)	5.321 (0.059)	4.588 (0.109)	4.688 (0.144)
2002 dummy	2.012 (0.027)	4.659 (0.032)	4.236 (0.050)	3.487 (0.106)	3.603 (0.140)
2003 dummy	2.483 (0.026)	5.103 (0.030)	4.673 (0.047)	3.933 (0.106)	4.041 (0.136)
2004 dummy	2.336 (0.028)	4.877 (0.031)	4.452 (0.051)	3.706 (0.105)	3.821 (0.137)
2005 dummy	3.410 (0.025)	6.072 (0.040)	5.632 (0.059)	4.900 (0.108)	5.000 (0.141)
B. Businesses	-1.712 (0.027)	-0.084 (0.025)	0.004 (0.026)		
C. Investment funds	-0.256 (0.041)	-0.824 (0.044)	-0.699 (0.042)		
Tax preference $\theta$				1.234 (0.117)	0.700 (0.148)
Beta (Market)		-0.711 (0.021)	-0.423 (0.032)	-0.715 (0.022)	-0.426 (0.037)
Beta (HML)			1.417 (0.015)		1.412 (0.015)
Beta (SMB)			0.525 (0.030)		0.525 (0.032)
Idiosyncratic risk		-0.088 (0.001)	-0.087 (0.001)	-0.087 (0.001)	-0.086 (0.002)
Pseudo $R^2$	4.1	45.4	47.7	45.4	47.6
N	164,743	164,743	164,743	164,743	164,743
$N_0$	29.9	29.9	29.9	29.9	29.9
$E(Y_{it} B, \bar{X}_{it}) - E(Y_{it} A, \bar{X}_{it})$	-1.426 (0.025)	-0.082 (0.024)	0.004 (0.025)	-0.179 (0.017)	-0.102 (0.022)
$E(Y_{it} C, \bar{X}_{it}) - E(Y_{it} A, \bar{X}_{it})$	-0.230 (0.037)	-0.780 (0.040)	-0.667 (0.040)	-0.357 (0.034)	-0.204 (0.043)

The table presents the results of a pooled Tobit model where the dividend yield is regressed on portfolio characteristics over 2001–2005. The variables are defined as in Table 6. Standard errors based on a pairwise bootstrap (500 replications) accounting for conditional heteroskedasticity and serial correlation are reported in parenthesis. The pseudo R-squares (reported in %) are the squared correlations between predicted and observed dividend yields. N is the total number of observations available;  $N_0$  is the number of observations with zero dividend yield expressed in % of total number of observations. The lower part of the table presents how the expected dividend yield on portfolios held by tax-exempt investors (clienteles A) differs from the yields on other portfolios. The expected yields are calculated conditional on the typical characteristics of portfolios held by tax-exempt investors. Standard errors, calculated from the bootstrapped variance-covariance matrix in the Tobit estimation, are reported in parenthesis.



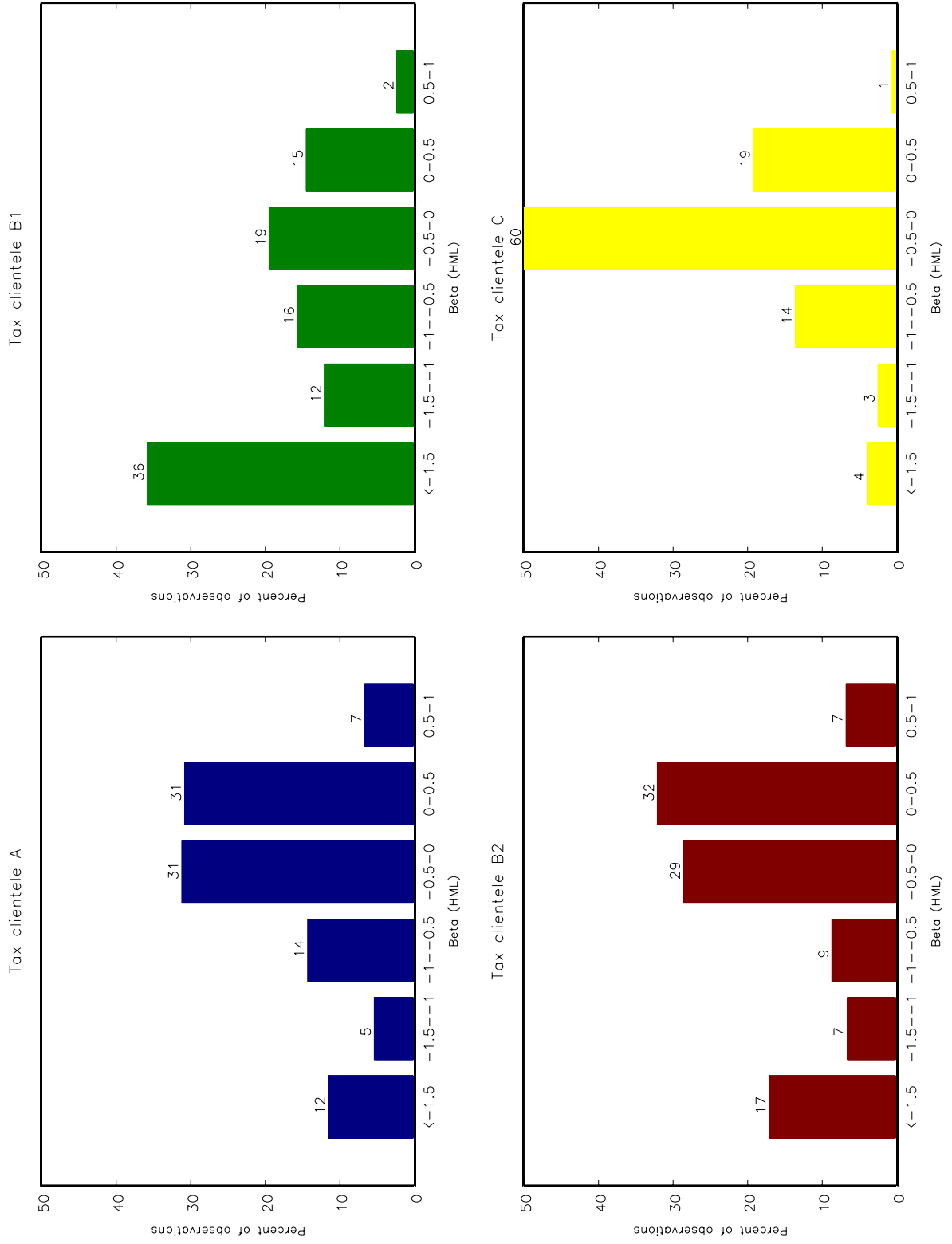
**Table 9: Market Value of Stock Portfolio Relative to Book Value of Assets**

	0-25%	26-50%	51-75%	76-100%	$\geq 101\%$	Sum
Non-financial firms	19,294 [72.1]	4,010 [15.0]	1,841 [6.9]	916 [3.4]	695 [2.6]	26,756 [100.0]
Assets < SEK 2 million	7,719 [63.2]	2,311 [18.9]	1,100 [9.0]	602 [4.9]	486 [4.0]	12,218 [100.0]
Assets $\geq$ SEK 2 million	11,575 [79.6]	1,699 [11.7]	741 [5.1]	314 [2.2]	209 [1.4]	14,538 [100.0]
Financial firms	626 [40.6]	389 [25.3]	237 [15.4]	144 [9.4]	144 [9.4]	1,540 [100.0]

The table presents the number of observations of the ratio of the market value of the stock portfolio to the book value of total assets. The frequencies of the observations (in %) are given in square brackets. Non-financial firms are further divided into firms with assets below and above SEK 2 million.

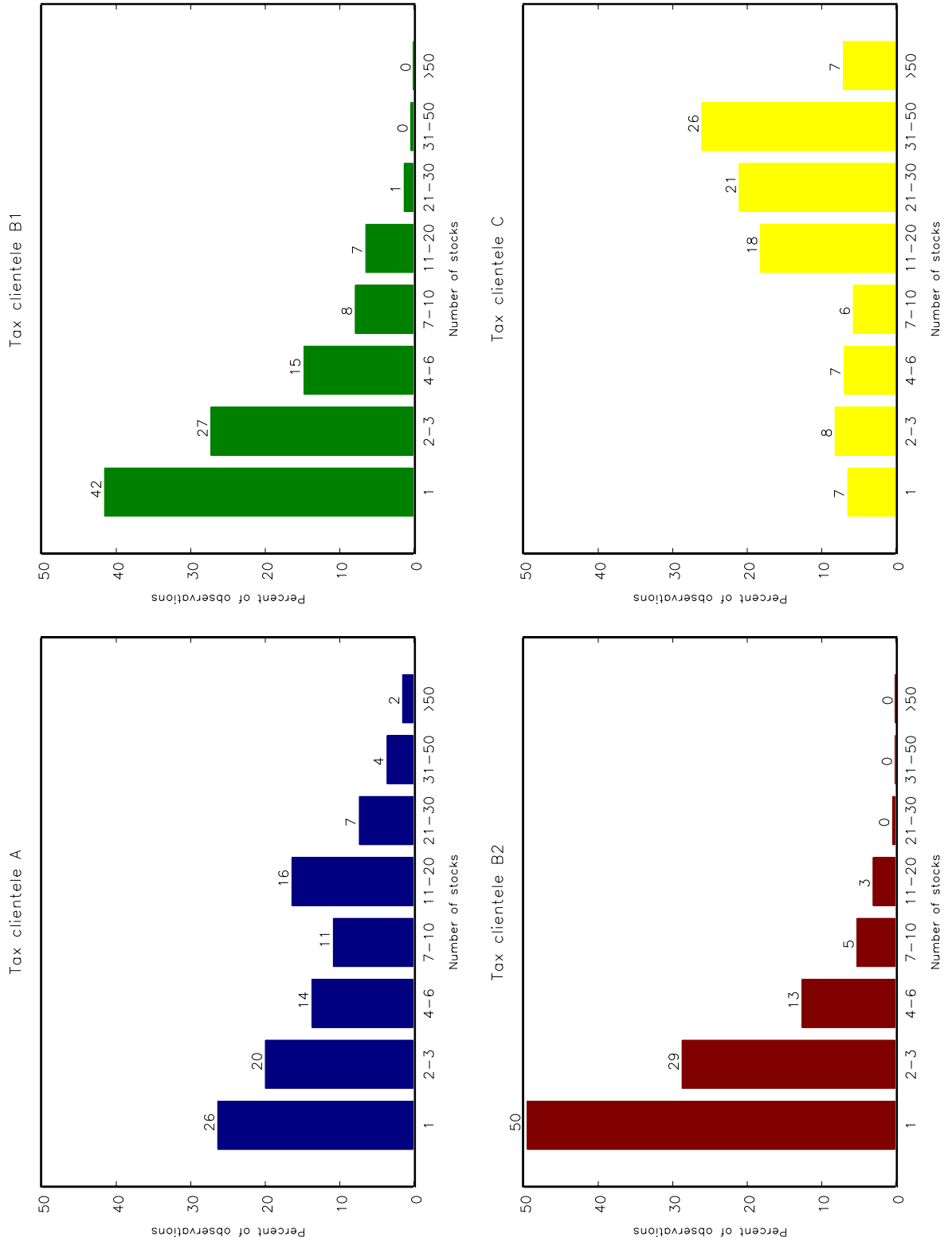
**Figure 1: Beta (HML) Loadings in Investors' Portfolios**

The figure displays percent frequency histograms of the beta (HML) loadings of portfolios held by tax clienteles A-C. Clientele B is further divided into B1 (Businesses) and B2 (Individuals).



**Figure 2: Number of Stocks in Investors' Portfolios**

The figure displays percent frequency histograms of the number of stocks in portfolios held by tax clienteles A–C. Clientele B is further divided into B1 (Businesses) and B2 (Individuals).



**Figure 3: Value of Investors' Portfolios**

The figure displays percent frequency histograms of the log value of the stocks in portfolios held by tax clienteles A–C. Clientele B is further divided into B1 (Businesses) and B2 (Individuals). The base for the log is 10, which means that 3 equals 1,000, 4 equals 10,000, etc.

