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The January Effect:
Does Tax Loss Selling Explain It

Name Student: Philip Schröder
Student number: 431955

Supervisor: Esad Smajlbegovic
Second assessor:

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1. Introduction

Observed market anomalies always get a lot of attention. The Efficient Market Hypothesis (EMH) states that all stocks are valued at their fair price thus making it impossible to beat the market as no stock is either under- or overvalued. Whenever an anomaly in the stock market arises and the anomaly can be exploited, its persistence has implications to the EMH. The January effect, i.e. a seasonal increase in stock prices during January, is one of the best-known anomalies on the stock market and therefore widely researched. In 1942 S. Wachtel was the first one to display the existence of the January effect in the USA. Up until 1976 the effect was not examined intensively, but after Rozeff & Kinney again confirmed the existence the January effect, it became one of the most researched subjects. Gultekin and Gultekin (1983) concluded the January effect was visible in 12 countries worldwide, confirming it was an international phenomenon. Even up until today, papers covering the January effect are published in well-established journals like the *Journal of Financial Economics,* the same journal that published the two previous mentioned articles.

Over the years multiple potential explanations were composed and researched. The most common explanation though is attributed to year-end selling pressure caused by tax loss selling (Reinganum, 1983). The tax loss selling hypothesis is based on the selling pressure in the last month of the fiscal year. This selling pressure arises because capital losses can be deducted from a persons' payable taxes. The last month of the fiscal year is one's last opportunity to realize these losses in order to deduct them from their taxable income in order to reduce tax payable. Among researchers agreeing with these hypotheses were Brown, Keim, Kleidon & Marsh (1983). They found results consistent with the tax loss selling hypothesis. On the other hand, other researchers like Jones, Pearce and Wilson (1987) did not find results consistent with the tax loss selling hypothesis. As some did find results consistent with the explanation and others not, the tax loss selling hypothesis was never fully accepted. Hence other explanations were composed and tested. Another prominent explanation for the January effect is the window dressing hypothesis which describes institutional investor behavior in December and January causing the price increase in January (Haugen & Lakonishok, 1988). Institutional investors tend to sell loser stocks before reporting periods and buy risky small stocks afterwards. The Risk return trade is another potential explanation for the excess returns in January. This explanation questions if the higher January returns may

be justified, as risk could be higher. A sketchier explanation for the January anomaly is that of the Accounting-Information signaling hypothesis. This hypothesis is about the release of new information by accountants about the firm's performance. This could result in increased risk in January, which supposedly could explain the observed high returns in January (Reinganum & Gangopadhyay ,1991).

This paper examines the tax loss hypothesis as explanation for the January effect. Most previous literature uses time series regressions to examine whether an effect in January can be found and focuses mainly on whether the anomaly is present in the USA stock market. This paper adds to existing literature as it examines multiple countries and indices all at once. The chosen countries differ from each other in whether capital gains are taxed and their fiscal year calendar. The tax loss selling hypothesis implies that the January effect is caused by end of tax year's selling pressure. As the data of this paper contains countries with different fiscal years and potential presence of capital gains tax, it would be expected to see an effect in the first month of the new fiscal year rather than in January. The data does contain multiple countries with January as the first fiscal month though, so the tax loss selling hypothesis implies that the return in the first month of the fiscal year should be higher than the return in January as well. This suggests that the January effect could actually be a proxy for the first month of the fiscal year. Through the use of panel data, returns of multiple countries and indices can be tested simultaneously. Using a fixed effect model the main research question of this paper will be answered, which is:

Does the tax-loss selling hypothesis explain the January effect?

As the panel data contains multiple countries with variation in fiscal year and presence of capital gains tax, it gives an excellent opportunity to test the tax loss selling internationally. With the use of a fixed effects regression, the effects within an index can be filtered which should give a more accurate estimation of the coefficients. Without using a fixed effects regression, its assumed that each index has the same mean return. Logically, this is not the case. The fixed effects regression method is furtherly elaborated in the Data & Methodology section.

This paper does not find evidence consistent with the tax loss selling hypothesis. First, the existence of the January effect was confirmed in the empirical research though. The returns in January are found to be significantly higher with respect to the other months. January produced on average 1.5% higher monthly returns. In the univariate fixed effects regression, the month after fiscal year dummy was significant as well with a coefficient of 0.7%. This was the first indication the tax loss selling hypothesis did not hold up in the results. Even though the returns in the month after fiscal year end turned out to be significantly higher than other months, the fact that the returns were lower than the January returns indicate the significance might come from other factors.

Secondly, to test the main research question a multivariate fixed effects regression was set up. The regression included dummy's for month after fiscal year, capital gains and an interaction term between those variables. The results showed no consistency with the tax loss selling hypothesis as the effect of the presence of capital gains tax and it being the first month of the new fiscal year did not significantly affect the variation in monthly returns. The month after fiscal year dummy was not found significant as well, with a coefficient of about 0.8%. Indicating that the return in the months after the fiscal year, for countries with no capital gain tax regime, did not significantly differ from the other months. Altogether, the results do not confirm the tax loss selling hypothesis in any way whatsoever.

Despite not finding evidence supporting the tax loss selling hypothesis, a significant positive relationship between capital gains taxation and monthly returns was uncovered. This positive relationship regards only Germany though. As the fixed effects regression filtered effects within an index, the presence of capital gains in the index's country is absorbed as well. As Germany has been the only country changing its tax policy during the examined period, only Germany affected the coefficient. The higher returns after the implementation of capital gains tax in Germany does not mean the tax implementation caused it tough. Many macroeconomic variables could have affected these higher returns. GPD, interest rates and inflation for instance. A booming market implies higher returns no matter the tax policy.

The organization of this article is as follows. In Section 2 features literature on the subject. Section 3 describes the data and methodological aspects. In section 4 the empirical results on the tax-loss selling hypothesis are presented. Section 5 provides some concluding remarks.

2. Literature Review

2.1 The Efficient Market Hypothesis

The Efficient Market Hypotheses (EMH) states that securities markets are fully efficient, that supposedly all information is incorporated in the prices. According to the EMH, stocks always trade at their fair value implying that outperforming the market is impossible. As the EMH claims all information is supposed to be incorporated instantly, only the news of today should affect today's stock price changes. The stock changes of tomorrow should not be affected by today's changes, stock prices should be unpredictable (Malkiel ,1989). Thus, the EMH states that stock prices are completely random and unpredictable. Implying that all methods of forecasting stock prices are futile in the long run. Therefore, the EMH is closely associated with a random walk model.

According to Fama (1970) there are three forms of market efficiency; the Weak form, the Semi-Strong form and the Strong form. The weak form suggests that all historical information is priced into securities. Meaning that producing excess returns based on historical information is unachievable. The Semi-Strong form implies that all public information is incorporated into the price, indicating that all new information is instantaneously being processed into the price. The last form is the Strong form, which implies that both public and private information is integrated into the stock's price, meaning no investor can earn systematically excess returns. The Strong form is in almost every market impossible. Many countries and their markets set up legal barriers to prevent people trading with private information. Thus, this private information will not be incorporated in the stock price. With legal barriers the Strong form of the EMH is not achievable. The presence of these legal barriers also implies that trading with private information probably does produce excessive returns, meaning the Strong form is as good as refuted in most markets. Nevertheless, the EMH has been widely accepted as a valid hypothesis. It should be noted that abnormally high returns of course can be earned accidentally, but no systematic profits can be made according to the EMH.

The existence of the January effect is in contradiction with the EMH. If the January return is higher than other months, investors could systematically outperform the market. Also, if the stock market is efficient, it would have been expected that the January effect should have disappeared since its discovery as investors would anticipate on the effect (Haugen & Jorion,1996). Conflicting, it has been empirically proven that the January effect still existed multiple years after since its discovery. This is the reason as to why the January anomaly has been given so much attention.

The January effect is not the only anomaly to the EMH. Over the years multiple anomalies were noticed. For example, Lakonishok et al. (1994) investigated the return of so-called value and glamour stocks. Glamour stocks are stocks that have done great in past years, resulting in overvaluation of these stocks among investors. Value stocks are the opposite, after some very badly results these value stocks become underpriced. Lakonishok et al. found that value strategies, strategies that consists of value stocks, outperform the market. The fact that apparently stocks are mispriced, thus providing the opportunity to make excess returns, indicates the EMH is not entirely correct.

2.2 The January Effect

The January effect is one of the best-known examples of irregular behavior in security markets. Therefore, there has been a lot of previous research into the January effect. The first mentioning of a January effect was by S. Wachtel in 1942. Wachtel displayed bullish behavior from December to January in the Dow Jones Industrial Average from 1927 to 1942. Up until 1976 the January effect hasn't been an important subject in the finance world, that altered with Rozeff & Kinney's article. Rozeff & Kinney's article was seen as the first real evidence that a January effect existed, contradicting the accepted asset pricing theories. The paper presented evidence of statistically significant higher average returns in January on the New York Stock Exchange between 1904-1974 using an equal-weighted index. Gultekin and Gultekin (1983) added international evidence for the existence of the January effect. Using non-parametric methods, they found evidence of the January effect in 12 of the 16 countries examined using data from 1959-1979. A more recent article from Haugen & Jorion (1996) also provided evidence for the January effect on the USA market, between 1926 -1993. They found

no significant change in the magnitude the effect occurs, indicating no disappearance of the effect is in place, while this is expected according to the EMH. Lakonishok & Smidt (1988) showed that in a price-weighted index, an index made up of primarily large capitalized companies. No January effect could be identified. The fact that in most cases a January effect can only be observed in equal-weighted indices, in which small capitalized companies (from now on mentioned as small firms) have greater weight compared to other weighted techniques, suggests that the January effect primarily is a small firm phenomenon (Thaler, 1987). Although these papers provided evidence of the existence, empirical explanations were absent. Since then multiple potential reasons were imposed by researchers.

2.3 Capital Gains Taxation

To understand the latter literature, an understanding of capital gains tax is required. Capital gains are whenever one realizes profit on a sale of a non-inventory asset. In most cases this relates to the sale of stocks and bonds, however it can also be property for instance. Each and every country can decide for itself if it will tax capital gains. Which assets are subject to the capital gains tax and which are not is again up to the country itself. Countries differ in whether they tax capital gains but also in the applicable tax rate. For instance, the United Kingdom taxes 18% on residential property and 10% on other chargeable assets. In Germany the capital gains tax is 25% since 2009. Meanwhile in the Netherlands no capital gains tax exists. The countries themselves can also determine their tax year. In the Netherlands the fiscal year equals the calendar year, January until December. This doesn't have to be the case though, Canada for example has a fiscal year from April until March. It seems logical that the presence of a capital gains tax has an effect on the stock market. Capital gain tax lowers the gain investors make but at the same time reduce the risk as losses are deductible from taxable income thereby reducing tax payable.

There has been some research into this relation between capital gains tax and returns. Sikes and Verrecchia (2012) concurred with other literature that found a positive relation between capital gains tax rate and returns. The intuition behind this is that when the capital gains tax increases, the investors expected after-tax cash proceedings decrease. However, the risk associated with the expected after cash proceeds similarly decrease as well, which leads to an increase in the firm's stock price (Sikes & Verrecchia, 2012). Although the authors agreed

with this relation, some examples were given in which the relation could be negatively related. One example is when the market risk premium is high. If the capital gains tax increases, this market risk premium decreases significantly. Whenever this decrease in market risk premium overshadows the opposing effect of the reduction in after-tax proceeds, the relationship is negative (Sikes & Verrecchia, 2012). The relationship apparently is not always positive. There hasn't been much literature into the relationship yet, it's still unclear what the exact relationship is.

2.4 The Tax Loss Selling Hypothesis

The tax loss selling hypothesis is one of the most prominent explanation for the January effect. It has been the most frequently cited explanation since Branch (1977) mentioned the possible effect. It is based on the fact that the premium in the first few days of the year is a reaction to tax selling pressure at the end of the tax year. This selling pressure comes from capital gains taxation. When making capital gains, taxes must be paid. However, whenever a person realizes capital losses, the realized losses reduce the taxable income of that person thereby reducing its tax obligation. This tax selling pressure at the end of the fiscal year may explain the unusually large returns in January (Reinganum, 1983). The tax-loss argument relies on the assumption that investors wait until the tax year-end to sell their losers (Brown, Keim, Kleidon & Marsh, 1983). Reinganum (1983) found that primarily small firms experience large returns in January and often within the first few days of January. Nevertheless, he indicates that the tax loss selling cannot explain the entire January effect as the prior winners experience large returns as well whilst being least likely to be sold due to tax reasons. Since Branch (1977) proposed the tax loss hypothesis as explanation for the January effect, multiple researches have been done to confirm or deny the suggestion. A couple articles testing the hypothesis are presented below.

Jones, Pearce and Wilson (1987) examined the tax loss selling hypotheses as explanation for the January effect. In their research they compared returns in January of the Dow Jones Industrial Average prior to capital gains tax and January returns after capital gain tax introduction. According to the tax loss selling hypotheses, prior to capital gain taxation there shouldn't be an observable January effect as no tax loss selling would take place. The data they used was constructed, using the form of the S&P500, for the period 1871 through 1938.

The tax act was introduced in 1917 in the USA, hence the chosen data period. Their empirical results did not show a statistically significant change between the returns prior and after the tax introduction. This is inconsistent with the tax loss selling hypotheses, which would imply a higher January return after the introduction of capital gains taxation. Tinic et al. (1987) did a similar research for the Canadian stock market. In 1972 the capital gains taxation was introduced in Canada. The article used data from before and after the tax introduction as well. A January effect was observed both before and after the introduction of capital gains taxation. The results did not uncover significant differences between the return premium following the capital gains tax imposition like the article from Jones, Pearce and Wilson (1987). Both articles' results did not find evidence for the tax loss selling causing the January effect. However, Tinic et al. (1987) did find a change in the relationship between January returns and the return in the preceding months. Before the imposition of the tax, the correlation was positive more often than not. After the imposition though, the relationship shifted to a significant negative one.

This negative relationship is in line with the tax loss selling hypothesis. If in the last months of the fiscal year the return is negative, these stocks will likely be sold due to tax saving reasons. So, although the tax loss selling hypothesis was not consistent for explaining the January effect in their study, it still had an effect on investor behavior.

Brown, Keim, Kleidon & Marsh (1983) examined another implication of the tax loss selling hypotheses in 1983. They inspected the Australian market, as Australia has the same tax laws as the USA but a different fiscal year; July until June. The hypothesis would predict that Australia would see a July effect instead of a January effect. In this case the tax loss selling would occur in Juni instead of December because of the different fiscal year. The authors suggested that in Australia the tax loss selling effect should have been even higher than in the USA, as there wasn't a maximum reduction in tax for Australian tax payers. Brown, Keim, Kleidon & Marsh did find higher raw returns in July, but so did they for January. Finding higher returns in July was consistent with the tax loss selling hypothesis, however finding higher returns in January is striking. They suggested that it's conceivable a tax-induced January effect could show up in the Australian stock market but it's a little farfetched. They also mentioned; "Although the original hypothesis is at least consistent with the U.S. January premium, the story seems to be much more complicated if it is to be reconciled with the Australian data."

Reinganum and Shapiro (1987) did the same research as Brown et al. but for the UK instead of Australia. The personal fiscal year in the UK ends on 5th April, offering another opportunity to test if the January effect is explained by tax-loss selling. For the UK this should occur during April. Reinganum and Shapiro additionally examined data both before and after the introduction of capital gains taxation in the UK. Their results revealed no detectable higher returns in any month prior to the tax introduction. Their results of the data after the introduction are therefore remarkable. They found for both January and April higher returns than other months. The results found for April are consistent with the tax selling hypothesis. However, the results in January are only partially consistent with the tax loss selling explanation. The tax year for firms and government in the UK actually does end in December, which partly explains the higher returns in January as well. However, the research also examined if primarily the bigger losers saw this abnormal return in January as a consequence of the tax loss selling as the bigger losers would be more likely candidates to be sold for tax motives. They could not empirically confirm this was the case. Altogether, the tax loss selling hypothesis is only partially consistent with the results.

A more recent article from Yong & Zheng (2006) claimed to have found evidence for the tax loss selling hypothesis as an explanation for the January effect. They examined municipal bond closed-end funds, which are mostly held by tax sensitive individual investors. As the municipal bond closed-end funds are held by the most tax sensitive investors, there should be a similar or even stronger January effect (Yong & Zheng, 2006). The data used is from 1990 until 2000, thus a little more recent than previous discussed literature. Young & Zheng examined both the trading and returns patterns in January, November and December. They found that the abnormal returns in January are positively correlated with the year-end trading volumes. As well as that the year-end volumes are negatively related to the current and the previous year returns. These findings are consistent with the tax loss selling hypothesis, as it predicts that the trading volume for funds that experienced larger price declines should be higher.

2.5 Other Hypotheses

2.5.1 Window Dressing Hypothesis

As the tax-loss selling hypothesis is not flawless, researchers have examined multiple explanations for the higher January returns besides tax reasons. One of the alternative explanations is the "Window dressing" hypothesis, developed by Haugen & Lakonishok. It might be best explained by the following quote from an institutional investor from Jansson (1983): "Nobody wants to be caught showing last quarter's disasters. You throw out the duds because you don't want to have to apologize for and defend a stocks presence to a client even tough your investment judgement may be to hold". The hypothesis implies that institutional investors sell losers before the reporting period to hide their mistakes. Usually after the reporting period the institutional investors rebalance their portfolio's again to more riskier investments e.g. small cap stocks. This could potentially explain the higher January returns for small stocks.

Ritter & Chopra (1989) found results consistent with this window dressing hypothesis. They used beta as a proxy of risk and investigated whether these riskier stocks outperformed the market in January. They found a positive relation between the excess return on small firms and beta's, regardless the direction of the market in January. The higher the beta the higher the return. Even in Januaries for which the return was negative, the small firm return turned out positive. The window dressing hypothesis predicts that in January, the institutional investors start buying the riskier stocks again. These risky stocks were sold before the reporting period to hide those risky investments that might have gone wrong. As primarily the riskier stocks outperformed the market in January, their research is consistent with the window dressing hypothesis.

Chen and Singal (2004) try to disentangle the previous two explanations from each other, as tax loss selling and window dressing induce the same investor behavior e.g. selling in December and buying in January. Chen and Signal found a way around this, mutual fund managers are required by law to provide semi-annual accounting information. This gives rise to the opportunity to test the window dressing hypothesis without interference of the tax loss selling. According to the window dressing hypothesis it's also expected to see excess

returns for small stocks in July and selling of small stocks in June as a reporting period occurs. To test these expectations, they inspected the last five trading days of June and the first five of July. They found similar returns between those periods, indicating no sign of window dressing. The window dressing hypothesis suggests an increase in volume for small stocks in June and an increase in large stocks in July as well. Chen and Singal found no results indicating window dressing is present in trading volume.

2.5.2 Risk-Return Trade

Another explanation of the January effect that will be discussed is grounded on the presence of a positive January risk-return trade. Tinic and West (1984) investigated whether the risk premium in January was different to the other months. They state in their research that the risk premium is positive in January for the USA. For the other eleven months no significant difference from zero for the risk premium was found. Rogalski & Tinic (1986) also questioned if the January effect is reasonable because of possible higher risk. They state that previous research assumed that the risk of small stocks remains constant throughout the year, while this doesn't have to be the case. They debate whether the risk is higher in January than other months, to test this they used the variance of the stock returns as measure of risk. Their results point out a higher required rate of return for small stocks in January compared to the other months. Which could mean the excess returns for small stocks in January is actually justified, as more risk results in higher potential results.

2.5.3 Accounting-Information Hypothesis

Reinganum and Gangopadhyay (1991) tested the Accounting-Information hypothesis. They proposed the January effect might be explainable by a *fiscal year-end accounting effect*. The Accounting-Information hypothesis suggests that in January there is a higher risk caused by uncertainty about the awaiting firm performance announcement. To test this hypothesis, they started by examining whether firms with other months as last accounting-fiscal month experienced a significant increase in stock return in the subsequent month. It turned out, no such increase could be detected. Yet all firms displayed large January returns, irrespective to their fiscal year-end month. The Accounting-Information hypothesis failed to explain the January effect.

3. Data & Methodology

The data used for the empirical research originates from financial database Datastream. The data contains 35 indices divided over 10 countries. These countries have been manually selected while sufficient variation in fiscal years and capital gains taxation was desired. The indices are also manually chosen, for which also adequate differences had to be present. For every country is distinguished whether there is capital gains taxation and the fiscal year calendar. Germany is the only country in the data set that introduced capital gains tax during the examined period, all other countries held onto their tax policy. If tax loss selling is indeed the dominant explanation for the January effect, countries with different fiscal years should see the January effect in another month. From Datastream the monthly time series of the total return were obtained from the years 1980 up until 2018 for all indices. For each month a monthly return was calculated as a percentage in the change of value of the index compared to the prior month. The formula used is presented below:

$$(1) R_t = \frac{Return\ Index_t - Return\ Index_{t-1}}{Return\ Index_{t-1}} * 100$$

In Table 1 the descriptive of the data can be found, including fiscal year and if capital gains taxation is existing. Subsequently these time series were combined in one panel dataset, which combines time series and cross-sectional data. This will give a more accurate inference of model parameters as panel data has more sample variability (Hsiao et al. 1995).

The empirical research starts with a fixed effects regression to examine whether there's still an observable effect in January for all indices. Regression (2) will be used to examine this. This regression includes a dummy variable for whether the month is January. The dummy variable takes value 1 if the particular month is January and 0 otherwise. A_i is the unobserved time-invariant index effect. Thus, through the use of fixed effects any time invariant effects within an index are eliminated. Meaning that effects that affect potential higher or lower returns for an index will be excluded from the coefficient estimations. Saying it differently, A_i absorbs all the variables that might affect R_{it} cross-sectionally but do not vary over time. In this case, on which index the returns are acquired. Looking at Table 1, it is visible that some indices outperform the others in every month on average. By using a fixed effects regression, this variation between indices is eliminated. U_{it} is the error term. In this research a 5% significance

level will be used. There has been made use of standard robust errors as the data sample contained heteroskedastic variances between indices.

$$(2)\ R_{it} = \beta_1 D_{january,it} + a_i + u_{it}$$

In order to test whether the January effect is explained by the tax-loss selling hypothesis, a couple of new variable dummies were created. The first one is a dummy for whether it is the first month of a new fiscal year. As the tax-loss selling hypothesis suggests that high January returns are explained by the selling pressure induced by tax at the end of the fiscal year, it's expected to see a higher return in the first month of the new fiscal year. This dummy will capture this phenomenon. Additionally, a dummy is added for if capital gains tax is existent in that particular country. This variable will tell us whether returns are higher in countries with capital gains tax. As last variable an interaction term between the previous two variables is added. It is expected, according to the tax-loss selling hypothesis, that whenever a country has capital gains tax and it's the first month of the new fiscal year an (additional) effect should take place. All the remaining regressions that will be done, start with univariate regression of all variables. This will be done to give a descriptive analysis, before doing an explanatory analysis in the form of a multivariate regression. Firstly, the hypothesis was tested through the use of a pooled time series regression. The regression used is printed below.

$$(3)\ R_t = \beta_0 + \beta_1 D_{new\ fiscal\ year} + \beta_2 D_{capital\ gains} + \beta_3 D_{new\ fiscal\ year * capital\ gains} + u_t$$

In the regression (3) the dummy for new fiscal year takes value 1 if the concerned month is the first month of the fiscal year and 0 otherwise. If in that particular country capital gains tax is present, the capital gains dummy will take value 1. The interaction dummy takes value 1 if both dummies capital gains tax and new month of fiscal year are value 1. A disadvantage of time series regression that is it doesn't take into account that there might be some intrinsic differences between the indices, which makes the monthly return differ. Although this method might not be the best for explaining the effect, it does give descriptive analysis. To make a more accurate examination, a fixed effect regression will be performed as well, through the equation below.

$$(4)\ R_{it} = \beta_1 D_{new\ fiscal\ year,it} + \beta_2 D_{capital\ gains,it} + \beta_3 D_{new\ fiscal\ year * capital\ gains,it} + a_i + u_{it}$$

Where R_{it} is the monthly return for index i at time t. B_1 is the coefficient for the dummy whether it's the first month of the new fiscal year. B_2 is the coefficient for if the index's country has capital gains tax. Whether the interaction term is significant can be told depending on B_3. A_i is the unknown intercept for each index. Again, implying that the fixed effects that are within an index do not affect the variable coefficients as it does in the previous pooled time series regression. U_{it} is the error term. The conclusions in this paper will primarily be made on regression (4)

Table 1
Descriptive of the data

Index	*Country*	*Month after Fiscal year ends*	*January Return*	*Other months*	*Capital gains tax*	*First month new tax year*
Dow Jones Industrial	USA	1,88%	""	0,84%	Yes	January
S&P500	USA	1,81%	""	0,85%	Yes	January
S&P400	USA	2,52%	""	0,91%	Yes	January
AEX	Netherlands	3,22%	""	0,83%	No	January
AMX	Netherlands	2,81%	""	0,91%	No	January
DAX	Germany	2,30%	""	0,72%	Yes/No	January
MDAX	Germany	1,90%	""	0,92%	Yes/No	January
SDAX	Germany	1,45%	""	0,70%	Yes/No	January
FTSE 100	UK	1,25%	2,68%	0,79%	Yes	April
FTSE 250	UK	1,54%	3,03%	1.01%	Yes	April
FTSE 350	UK	1,28%	2,73%	0,82%	Yes	April
FTSE Smallcap	UK	0,85%	2,26%	0,86%	Yes	April
S&P/NZX50	New Zealand	2,45%	1,45%	0,68%	No	April
S&P/NZX Mid	New Zealand	2,16%	2,08%	0,84%	No	April
S&P/NZX Small	New Zealand	0,05%	2,19%	0,13%	No	April
S&P/ASX50	Australia	-0.02%	2,38%	0,88%	Yes	July
S&P/ASX200	Australia	-0.12%	2,54%	0,89%	Yes	July
S&P/ASX300	Australia	-0.13%	2,55%	0,89%	Yes	July
IBEX35	Spain	1,90%	""	0,80%	Yes	January
S&P/TSX	Canada	1,91%	""	0,70%	Yes	January
S&P/TSX60	Canada	2,02%	""	0,66%	Yes	January
Hang Seng	Hong Kong	-0.14%	1,79%	1,34%	No	April
CAC 40	France	2,13%	""	0,74%	Yes	January
CAC Mid 60	France	2,65%	""	0,83%	Yes	January
CAC Small	France	2,38%	""	0,60%	Yes	January

4. Results

The first examination of the monthly returns was done using regression (2). This regression includes a January dummy to examine whether an observable January effect could be found. The January variable was highly significant, the January returns were on average 1.5% higher than the other months. This outcome indicates that a January effect is present in the data set, as the return is higher in January.

After verifying the existence of the January effect in the data set, regression (3) was used to examine whether tax loss selling has correlations regarding the existence. Note that regression (3) is a pooled time series regression, so it doesn't correct for effects within indices. First the two main variables were pulled through a univariate regression to see any descriptive correlation relative to the returns. The dummy variable for the first month of a new fiscal year was found significant with an average 0.7% higher return in those months. The capital gains tax dummy was not found significant indicating no correlation could be found when regressing the returns on whether capital gains tax was active in that specific country in that specific month.

When adding the two main variables and the interaction term in a multivariate regression, only the month after fiscal year dummy was found significant. As the interaction dummy was not found significant, it appears that the addition of having capital gains as well as the first fiscal month did not produce an additional effect on top of only being the first fiscal month. The fact that the first month of a new fiscal year does appear to produce higher returns is odd as the interaction term does not appear to make a difference. Although, the fact that most countries examined did have January as first month of the new fiscal year could explain the significance of the dummy. Note that the coefficient for the new fiscal year month only relates to indices with no capital gains tax at that time. Altogether, these findings are inconsistent with the tax-loss selling hypothesis, as the presence of capital gains in the first month of the new fiscal year supposedly should explain the higher returns.

This method of research did not take into account the fact that within each index, some fixed effects could have taken place. For instance, an upward or downward trend could have interfered with our results. Therefore, these results will not be used in the concluding remarks

on about whether tax loss selling explains the January effect. Although this method might not be the best for explaining the effect, it does give descriptive analysis. The coefficients can be found in Table 2.

Using regression (4) potential effects within an index are accounted for by using a fixed effects model. The results found by exercising this regression will be used to determine the explanatory power of tax loss selling. In Table 3, the results can be found along with the January regression. Again, first the main variables were used in a univariate regression. In the univariate both the variables were found significant. In the month after a fiscal year, the return seems about 0.7% higher than in the other months. This 0.7% is lower than what was found for the returns in January. Therefore, this would be inconsistent with the tax loss selling hypothesis. It was expected according to the hypothesis that the returns would be higher in the first month after the fiscal year. Finding the opposite already questions the explanatory power of the tax loss selling hypothesis. The results did reveal a positive relation between the presence of capital gains tax and the average monthly return. Note that as the fixed effects regression absorbed index fixed effects, the coefficient for capital gains tax is solely affected by Germany as explained. This is because Germany was the only country in the dataset that changed its tax policy regime during the observed timeframe.

Again, these main variables were also used in a multivariate regression with the addition of an interaction term. As said before the univariate is mainly used as a descriptive analysis, while we are more interested in the explanatory power of the variables. In the multivariate regression the coefficient for the month after fiscal year dummy was found insignificant. Meaning that the first month of a new fiscal year had no explanatory power in explaining the monthly return variations. Capital gain tax did show a significant effect on the average monthly returns. The coefficient showed an 0.5% increase in monthly return whenever a country had capital gains tax, proposing that the presence of capital gains taxation increases return on average with 0.5% for the months not after the fiscal year. As Germany was the only country changing its tax regime, it appears the introduction of capital gains tax increased these monthly returns in Germany on average with 0.5%. The finding of this positive relationship isn't that straight forward, as many macroeconomic variables could explain the higher returns as well. In the conclusion more remarks are made concerning this outcome. The interaction term, which ultimately decides the outcome, was not significant in the

multivariate regression. No extra effect occurs when it's the first month of a new fiscal year while capital gain taxation is present. Thus, as well as the pooled time series regression, the fixed effects regression did not find consistent results for the tax-loss selling hypothesis. The interaction term was expected to be significant in the multivariate for a consistent result with the tax-loss selling hypothesis.

Table 2
Coefficients for the variables through pooled time series regression (2)
T-value is shown in parenthesis for according coefficient
Specifications (1) & (2) are univariate, (3) is multivariate
* = significant at 5% confidence level

Variable	(1)	(2)	(3)
Month after fiscal year	0.007 (4.50)*		0.008 (2.55)*
Capital gains tax		-0.000 (-0.56)	-0.001 (0.47)
Month after fiscal year & Capital gains tax			-0.001 (-0.29)

Table 3
Coefficients for the variables through fixed effect regression (1) & (3)
T-value is shown in parenthesis for according coefficient
Specifications (1), (2) & (3) are univariate, (4) is multivariate
* = significant at 5% confidence level

Variable	(1)	(2)	(3)	(4)
January	0.015 (14.59)*			
Month after fiscal year		0.007 (3.33)*		0.008 (1.55)
Capital gains tax			0.005 (2.96)*	0.005 (3.11)*
Month after fiscal year & Capital gains tax				-0.001 (-0.18)

5. Conclusion

The empirical results of this paper are not in accordance with the tax loss selling hypothesis as an explanation of the excess January returns. The tax loss selling hypothesis suggest that the high returns in January are a consequence of the year-end selling pressure due to capital gains taxation (Reinganum, 1983). As multiple countries in this paper's dataset have different fiscal years and differentiation in capital gains taxation as well, it was expected to see their January effect in their corresponding month. This paper examined these months after the fiscal year for all countries and did not find a significant relationship with monthly return. The empirical results are contradicting the articles from Brown et al. (1987) and Jones et al. (1987). In those papers this implication of the tax selling hypothesis was also examined, for respectively the UK and Australia. Both countries have a different fiscal year than the calendar year. Both papers found an effect in the first month of a fiscal year as well as a January effect. This paper did not find such effects in these months, or at least no explanatory effects. The results were consistent with the findings of Jones, Pearce and Wilson (1987) though, they did not find the tax loss selling hypothesis consistent with their results as well.

Although no consistent results with the tax loss hypothesis could be found, results were consistent with the existence of the January effect. Wachtel (1942) was the first one to observe the effect between 1927-1942 on the USA stock market. After him Rozeff & Kinney showed the phenomenon existed between 1904-1974 in the USA as well. Gultekin and Gultekin (1983) added international evidence for the existence of the January effect. My results conform with their results, as a January effect is observable between the 35 indices and 10 countries. It is especially interesting to find a January effect without correlation with tax loss selling as it initiates further research into what does explain the seasonal price rise.

For capital gains a positive relation to returns was found for Germany, which was consistent with the article from Sikes and Verrecchia (2012). Having capital gains taxation increased the monthly return for non-first fiscal year months significantly. Sikes and Verrecchia (2012) said that the risk associated with the after-tax returns decreases because of capital gains tax, which would increase share price. However, this conclusion is still debatable as there hasn't been much literature in this relationship yet. Even Sikes and Verrecchia (2012) themselves

found examples in which this relationship actually is negative instead of positive. Other note that should be made is that the positive relationship that was found might be because of influences of macroeconomic variables. If for whatever reason Germany had a booming market after the introduction of the capital gains tax, the monthly returns logically will be higher than before. Macroeconomic variables like GDP, inflation, employment rate and a dummy for whether the market was positive or negative the previous year etc. should be incorporated in the research to make a more accurate estimate. As this was not the purpose of the paper, I'll leave this for future research.

As a follow-up research, I would also suggest to only use small cap indices. Although the January effect is still observable in my data set, it is known the effect is primarily a small cap phenomenon. It could be that with only small cap indices there actually is an observable end of fiscal year effect. Furthermore, it could be interesting to analyze whether losers (small cap companies that decreased in value) have a significantly higher January effect than other small firms due to undervaluation in the last month of the fiscal year. I think it would also be interesting to see if a diminishing of the January effect can be detected The January effect has been a famous phenomenon for many years. It would be expected to see it sliding backwards in time until it eventually appears as investors can anticipate on the price decline in December and price rise in January. It could be that it is disappearing, but my data still contained a January effect because of the high excess returns in the first few years of the dataset. Or is the January effect actually increasing in countries with different fiscal years because of globalization? This I will leave to future research to find out.

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