Dynamic behavior of value and growth stocks

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SOM Theme E Financial markets and institutions

Abstract

The difference between the performance of growth and value portfolios presents an interesting puzzle for researchers in finance. Most studies showed that value stocks outperform growth stocks. This is the so-called value premium. In this article, we try to find an answer to the question as to why value stocks generate superior returns to growth stocks by dividing growth and value stocks into switching- and fixed-style stocks. We show that the difference in returns between value and growth stocks is caused by frequently rebalancing portfolios and find a value premium for the switching-style stocks and a growth premium for the fixed-style stocks. We will try to find an explanation for this phenomenon using the behavioral finance explanation that investors are unable to process information correctly. We use earnings announcement return data to test whether expectations of investors about future growth are too extreme.

Introduction

In finding an explanation for the value premium, several researchers relate to the inability of investors to process information correctly. For example, Lakonishok, Shleifer and Vishny (1994) suggest that value strategies yield higher returns as they exploit the sub-optimal behavior of the typical investor and not because these strategies are fundamentally riskier. They find a variety of variables that can define value and glamour portfolios and showed that all variables are statistically significant and have the power to predict returns, with the cash flow-to-price variable having the most significant predictive power.

In this context you can see the overreaction argument. High book-to-market stocks tend to be firms that are weak on fundamentals like earnings and sales, while low book-to-market stocks tend to have strong fundamentals. Investors overreact to performance and assign irrationally low values to weak firms and irrationally high values to strong firms. When the overreaction is corrected, weak firms have high returns and strong firms have low returns. Barberis , Shleifer and Vishny (1998) describe a conservatism bias that results in investors overweighing their prior beliefs and thereby under reacting to new information. In Daniel, Hirshleifer and Subrahmanyam (1997) investors are overconfident about their ability to evaluate securities. Because of attribution bias they overweight information that confirms their original valuation and underweight information that was inconsistent with their views. Daniel and Titman (1999) found evidence that suggests how overconfidence can generate both overreaction and underreaction and that both reactions can be consistent with the momentum effect. They give an example of the difficulty of valuing a company, which depends on future growth options. Valuing these growth companies, investors must rely on more subjective information and the overconfidence-related mispricing-effect should be stronger than for stable companies. They used the book-to-market fundamental as a proxy for vagueness versus concreteness of information. In their view low book-to-market stocks are stocks with more growth options and the prices of these stocks should exhibit stronger overconfidence effects.

La Porta (1996) and La Porta, Lakonishok, Shleifer and Vishney (1997) analyze whether investors make systematic mistakes by extrapolating past growth too far in future. They both use survey data on the expectations of stock market analysts. La Porta *et al.* (1997) analyze the past and expected future growth rates of stocks and define glamour stocks as stocks that had a high growth in the past and high expected future growth and conversely for value stocks. Their interpretation is that investors fail to impose mean reversion on growth forecasts. They examine the market's reaction to earnings announcements to determine whether investors make systematic errors in pricing. Because the superior returns to value strategies persist for at least 5 years, they expect a correspondingly long period of positive earnings surprises for value stocks and a long period of negative earnings surprises for growth stocks.

The aim of this paper is to test the expectational error hypothesis with a more sophisticated approach than La Porta *et al.* (1997) and La Porta (1996) represent. The reason for doing this is that in the empirical literature it is (generally accepted) standard to use the whole universe of value stocks to estimate the value premium. However, our research shows that the value-premium is generated by only a part of the stocks: the so-called switching-value stocks. Switching-value stocks are stocks that loose their status as a value stock during the evaluation period, as opposed to fixed-value stocks that are able to prolong their status as value stocks for several years. This means that the mispricing theory of La Porta *et al.* (1997) that suggest that the correspondingly long period of positive earnings surprises for value stocks must be found for the switching-value stocks and not for the fixed-value stocks. Furthermore, the mispricing theory also suggests that there should be a long period of negative earnings surprises for growth stocks. In our study we expect to find different behavior for switching- and fixed-growth stocks. We expect for switching-growth stocks a negative earnings surprise the year after formation. However, fixed-growth stocks that maintain their high price levels for four or more consecutive years cause a growth premium and are not responsible for negative returns. In this paper we test whether the mispricing theory of La Porta *et al.* (1997) also holds when we classify stocks based on their switching- versus fixed-style behavior. Following La Porta

(1996) and La Porta *et al.* (1997), we examine the market's reaction to earnings announcements to determine whether investors make systematic errors in pricing. We test the expectational error hypothesis, where the earnings surprises coincide with price changes of stocks, because the results of La Porta *et al.* (1997) suggest that the efficient market hypothesis is saved. We expect that if the error-in-expectation hypothesis is true a large part of the style-switch a stock makes can be explained with earnings announcement returns. We expect that the earnings surprises are positive the year after formation for the switching-value stocks and negative for the fixed-value stocks. For switching-growth stocks we expect negative earnings surprises and for fixed-growth stocks positive earnings surprises. This seems to be a circle reasoning, but in this paper we want to test with a new classification, whether we can find the same large fraction of announcement returns that can explain the value premium as La Porta et al. (1997) found.

We find little support for the expectational error hypothesis. In the year that value stocks switch from style we find higher returns that coincide with positive earnings announcement returns and higher earnings growth rates. For growth stocks we find that when they switch from style the announcement returns are negative and earnings growth rates are lower. Although the announcement returns are positive for switching-value stocks, the magnitude of the difference in announcement returns between switching-value and switching-growth stocks is only a small part of the total difference in returns between the annual buy-and-hold returns of switching-growth and -value stocks. This article is organized as follows. In section 2 we provide the methodology and hypotheses. In section 3 we describe the classification of the stocks and the data. Section 4 presents the results and section 5 concludes.

2 Methodology

La Porta, Lakonishok, Shleifer and Vishny (1997) claim that investors extrapolate past growth in sales too far into the future and that these extrapolative expectations are responsible for a large fraction of the mispricing. The large price-earnings ratio differences between value and growth stocks seem to reflect an expectation that past

growth differences will persist longer than is reliably predictable from past data. Value stocks generate superior returns because investors slowly realize that earnings growth rates are higher than initially expected. The opposite is true for growth stocks. La Porta *et al.* (1997) analyze the past and expected future growth rates of stocks and define glamour stocks as stocks that had a high growth in the past and are expected to have high growth in future. This is conversely the case for value stocks. Their interpretation is that investors fail to impose mean reversion on growth forecasts. They examine the market's reaction to earnings announcements to determine whether investors make systematic errors in pricing. Because the superior returns to value strategies persist for at least 5 years, they expect a correspondingly long period of positive earnings surprises for value stocks and a long period of negative earnings surprises for growth stocks.

In summary, growth stocks are defined as stocks, which had high past growth sales and are expected to have high growth in future. Thus sales growth is high over the past 5 years and the cash flow-to-price ratio or book-to-market ratio is low. Value stocks on the other hand are defined as stocks, which had a low past growth and are expected to have a low growth in future. Thus sales growth is low over the past five years and the cash flow-to-price ratio or the book-to-market ratio is high.

First we test whether event returns in the five years after ranking the stocks are systematically larger for switching versus fixed-style stocks. The reason to analyze stocks within their style-groups is that most of the research about investment strategies is based on the average returns on frequently-rebalanced dynamic trading strategies. Every year the portfolios are formed based on a particular style like the book-to-market ratio or the past return pattern. In all those studies there is no difference being made between stocks within a particular style-group. In this study we focus on the level of individual stock and distinguish between stocks that switch every year from style and stocks that are fixed in a particular style. Switching-style stocks are defined as stocks that belong for one year after formation to the same style group or are switching from year to year by different styles after ranking the stocks in

that particular style-group. Fixed-style stocks are stocks that belong for four or more consecutive years in the same style group over the period after formation.

Next, we will have a more detailed look at the earnings announcement returns studies by LaPorta *et al.* (1997). La Porta *et al.* studied the returns in days surrounding the earnings announcement. They found significantly positive announcement returns for value stocks, whereas the announcement returns for growth stocks were negative. In other words, they found that around the days of the earnings announcement the value investors were pleasantly surprised by the earnings, which indicates that their previous expectations were pessimistically biased. Apparently, investors were extrapolating previous growth trends too far into the future.

Since the expectational error hypothesis was tested without a distinction based on switching- and fixed-style stocks La Porta *et al.* (1997) expect the following signs for the announcement returns.

	Year after formation
Switching-Value	+
Fixed-Value	+
Switching-growth	-
Fixed-growth	-

The classification into switching and fixed-style stocks allows us to investigate the impact of style switching on the earnings announcement returns as well as the growth pattern. For example, we can explore the issue of the extrapolation of results too far into the future by looking at the fixed style stocks. Fixed-style stocks are particularly interesting, since they classify into the same valuation class for several periods. Consequently, any inferences on the announcement returns are less likely to be confused with changes in the valuation levels. If investors are really extrapolating far into the future, their misperception may last for several years and it must show in the

announcement returns. We can determine the horizon of the extrapolation bias by studying the earnings announcement returns for fixed-style stocks over a number of consecutive years. Since switching stocks are basically reclassified, we expect that the extrapolation bias ends after the moment of switching. Following La Porta *et al.* (1997) we expect for switching-style stocks that the announcement returns are positive or negative the year prior to switching and we expect a zero return in the year after switching. After the switch the stock no longer classifies to that particular style and therefor should not exhibit the valuation bias associated with that style.

After conditioning you should expect the following results for the announcement returns:

	Year after formation
Switching-Value	+
Fixed-Value	-
Switching-growth	-
Fixed-growth	+

Growth stocks

Switching-growth stocks are defined as stocks with high past growth, which initially are expected to continue to have high growth in the future as well. After one year they switch from growth to the medium or value group. What does this mean? The expectations about future growth have decreased and the fundamentals like cash flow-to-price ratio or book-to-market ratio are lower than in formation period.

Fixed-growth stocks are stocks, which had high growth in the past and are expected to have high growth as well in future. Different from switching-growth stocks, they are able to contain their promises for several years. After four or more consecutive years they switch from growth to the medium or value group. This means that for the next period after formation the book-to-market ratio must be equal to or higher than in formation period. Investors remain optimistic in their expectations about future growth rates for these stocks.

The expectational error hypothesis states that investor's expectation can be biased. One of these biases is the extrapolation of past results too far into the future, which means upward biased forecasts for stocks that performed well in the past, and downward biased forecasts for stocks that performed poor. This expectational error is also associated with the failure to impose mean reversion on economic scenarios. For switching –growth stocks the expectational error hypothesis implies that the expectations of investors become eventually rational. Investors realize that the initial

expectations about earnings growth rates of growth stocks were too extreme. Investors revise their expectations for their future growth downwards when lower earnings growth rates than initially expected are revealed on announcement dates. The sales or earnings growth is decreased in the first year after formation and investors sell these stocks. Thus if the expectational error hypothesis is true, the earnings announcement returns will have to be negative and the earnings (sales) growth rates will have to decrease in the first year after formation.

For fixed-growth stocks the expectational error hypothesis assumes that the expectations of investors were rational in the past. Investors expected that future growth rates would be high and these expectations appeared to be correct. The earnings growth rates for growth stocks are equal or higher compared to the initial expectations. The earnings growth rate is increased or equal in the first year after formation. If this hypothesis is true we expect that earnings announcement returns are zero and that earnings growth rates are the same in the first years after formation.

The behavioral hypothesis states that the expectations have not become rational yet, because investors still make mistakes in their expectations. Investors still believe that these growth stocks will have high earnings growth rates in future. The earnings growth is decreased in the first year after formation, but investors do not realize that earnings growth rates for growth stocks are lower than initially expected. For the behavioral hypothesis we expect that the earnings announcement returns are negative and that the earnings (sales) growth rates have decreased the first year after formation.

Value stocks

Switching value stocks are stocks with low growth in the past and they are expected to have low growth as well in the future. After one year they switch from value to the medium or growth group. This means that the expectations about future growth have increased and that the book- to-price ratio must be higher than in formation period.

Fixed value stocks are stocks, which have low past growth and are expected (low book-to-market ratio) in the future to have low growth as well. After four or more

years they switch from value to the medium or growth stocks. Thus the book-to-market ratio must be equal or lower than in formation period. The investors' expectations for these stocks are low and will stay low in the next four years.

For switching –value stocks the expectational error hypothesis states that the expectations of investors become rational. Investors realize that the initial expectations about earnings growth rates of value stocks were too extreme. Investors revise the expectations for their future growth upwards when higher earnings growth rates than initially expected are revealed on announcement dates. The sales or earnings growth is increased in the first year after formation and investors buy these stocks. Thus we expect in the first year after formation that earnings announcement returns are positive and that earnings (sales) growth rates have increased.

For fixed-value stocks the expectational error hypothesis assumes that the expectations were rational in the past. Investors expected that future growth would be low and these expectations appeared to be correct. The earnings growth rates for value stocks are equal or lower comparing with the initial expectations. Thus we expect that earnings announcement returns are negative or zero and that earnings growth rates are decreased or equal in the first years after formation.

The behavioral hypothesis states that the expectations are wrong, but investors make a mistake in their expectations. Investors still believe that these value stocks have low growth in the future. The earnings growth is increased in the first year after formation, but investors do not realize, that earnings/sales growth rates for value stocks are higher than initially expected. We expect that the earnings announcement returns are negative and that the earnings (sales) growth rates have increased the first year after formation.

3 Methodology of style switching

Style classification as is usual in the literature:

In our study we use the returns of the CRSP database and the accounting data of COMPUSTAT. The sample period covered in this study is from the January 1972 to the end of December 2001. Each stock is classified into three portfolios based on book-to-market value of equity (*BE/ME*) at the end of each year. The book-to-market portfolios include all NYSE, AMEX and NASDAQ stocks for which we have market equity data and book value of equity in December of year t-1. Stocks with negative values on book-to-market are left out. We exclude real estate investment trusts (REITs), American Depository Receipts (ADRs), closed end mutual funds, foreign stocks, unit investment trusts and American trusts. Companies should also have data on sales and earnings (before extraordinary items) and at least five years of data. We get the aannouncements returns over a three-day period (t-1, t+1) around the publication dates of the Wall Street Journal publication dates.

We use the same methodology as La Porta *et al.* (1997) to create benchmarks for the annual buy-and-hold returns and the earnings announcement returns. Annual buy-and-hold returns are adjusted for size as follows. For each year we divide stocks based on market capitalization, which is the total number of outstanding shares times the market price (this market capitalization is calculated at the last trading day of each year in June), in ten different size categories. The classification is based on the NYSE breakpoints[1], which are determined by the market capitalization in June of each year based on all NYSE stocks on CRSP. Because deciles may contain a disproportional part of value or growth stocks, we use only firms that are classified as neither value nor growth stocks based on the book-to-market ratio. The different deciles are equally-weighted portfolios. Annual-size adjusted returns are calculated for each

[1] The NYSE-breakpoints can be found at the Kenneth French website http://web.mit.edu/kfrench/www/data_library.html).The size breakpoint for year t is the median NYSE market equity at the end of June of year t. BE/ME for June of year t is the book equity for the last fiscal year end in t-1 divided by ME for December of t-1. The BE/ME breakpoints are the 30th and 70th NYSE percentiles.

stock by subtracting off the return of its corresponding size decile benchmark portfolio. The size-adjusted earnings announcement returns are calculated in a similar way. The benchmark portfolios for the earnings announcement returns are formed with all stocks that are neither value nor growth stocks and where earnings announcement return data is available. The decile benchmark returns are the equally-weighted earnings announcement returns. The size-adjusted earnings announcement returns for each firm is calculated by substracting off its corresponding size-decile earnings announcement benchmark.

The first step is to divide the stocks into three different categories based on their book-to-market ratio. Following Fama and French (1992, 1993), each stock is classified in three book-to-market groups based on the breakpoints of the NYSE stocks, which you can also find on Kenneth French's website. We label stocks below the 30th percent book-to-market equity (BE/ME) percentile as growth stocks and stocks above the 70th percentile as value stocks. The negative values for the book-to-market are left out.

Table 1 presents the annual buy-and-hold returns and the earnings announcement returns for value versus growth stocks for the formation period of 1973 to 1996. These results correspond with the results of LaPorta *et al.* (1997). The average difference in buy-and-hold returns between growth and value stocks is 10.5% in the first year after formation, 10.0% in year +2 and 8.5% in year +3. The differences in returns are significant for all five post-formation years. The difference in event returns is 0.9% one year after formation, 1.2% in year +2 and 1.1% in year +3. These differences are 8.4%, 12% and 12.5% of the annual buy-and-hold return differences.

Table 1: Annual buy-and-hold returns and 12-day announcement returns over the period 1974 to 2001 for NYSE, AMEX, NASDAQ stocks

Annual returns						
	Number	+1	+2	+3	+4	+5
Growth	13186	0.051	0.069	0.062	0.034	0.049
Value	5785	0.156	0.169	0.146	0.104	0.101
Difference		0.105	0.100	0.085	0.070	0.053
t-statistic		4.129	4.524	4.247	4.462	3.067
Event returns						
Growth	6343	0.0039	0.0009	0.0024	0.0007	0.0022
Value	2890	0.0127	0.0129	0.013	0.0132	0.0107
Difference		0.0088	0.012	0.0106	0.0125	0.0085
t-statistic		2.8737	4.0275	3.3206	3.3994	2.7084

Style switching

Classification of stocks based on book-to-market and market capitalization is a widely applied technique (see Fama and French (1993, 1995), Lakonishok, Shleifer and Vishny (1994)). Every year the portfolios are formed based on the whole universe of stocks in the United States. The typical outcome of this type of classification is that value stocks generate a higher return than growth stocks, the so-called value premium. In order to profit from this value premium, trading strategies in practice might deviate from the methodology described above. In this paper we investigate the implications of such deviations and in particular the effect of changing the criterion to classify stocks.

After the year of formation of the three different style groups we analyze the time frame that each stock belongs in a particular style group based on the book-to-market ratio. We only look at the switch a stock makes based on its book-to-market ratio. Stocks can switch from the lowest thirty percent or growth group to the medium fourthy percent or the medium group and from the medium group to the highest thirty

percent or the value group and back. We chose four different horizons and allocated the stocks in four different groups within each style-group resulting in 15 different portfolios (table 2).

The first group is the fixed-style group. In this group we only collect the stocks that belong for four or more consecutive years in the same style group over the period after formation. A fixed-growth stock is a stock, which belongs for four or more consecutive years in the category with a book-to-value ratio below the 30th percent of the NYSE breakpoints. The definition of a value fixed-style stock is a stock, which belongs four or more years to the value category and has a book-to-value ratio of the highest thirty percent.

The second group is formed based on stocks that belong for three consecutive years in the same style-group and the third group is based on stocks that belong for two consecutive years within a style-group after formation. Finally, the last group is called the switching-style group. These stocks belong for one year after formation to the same style group or are switching from year to year by different styles after ranking the stocks in that particular style-group.

Table 2 shows an overview of the switches that stocks can make. For example, a stock will be a switching growth stock if it starts in the first year as a growth. In the next year it does not belong to the thirty percent with the lowest book-to-market ratio and thus changes from style. A stock is a switching value stock if it starts in the first year as a value stock and will change from this value group to the medium or growth style group. It becomes thus a medium or growth stock in the next year.

Table 2: Overview of the different style-stocks within each style group

	Switches from style after one year of formation	Switches from style after two consecutive years of formation	Switches from style after three consecutive years of formation	Switches from style after four or more consecutive years of formation
After formation three portfolios are formed	T=1	T=2	T=3	T=4
Growth Medium Value	Switching-style stock			Fixed-style stock

The book-to-market ratio's (BM) are modelled as a three-state Markov chain, where the breakpoints are based on the ranking of stocks in growth, medium and value stocks. The transition counts and transition probabilities for the following 3-by-3 matrices:

Previous State	**Next State**		
	0>BM≤30% (growth)	**30%<BM≤70%**	**BM>70% (value)**
0<BM≤30%	N_{11}	N_{12}	N_{13}
30%<BM≤70%	N_{21}	N_{22}	N_{23}
BM>70%	N_{31}	N_{23}	N_{33}

Previous State	**Next State**		
	0>BM≤30% (growth)	**30%<BM≤70%**	**BM>70% (value)**
0<BM≤30%	λ_{11}	λ_{12}	λ_{13}
30%<BM≤70%	λ_{21}	λ_{22}	λ_{23}
BM>70%	λ_{31}	λ_{23}	λ_{33}

The maximum likelihood estimates (MLE) of the nine unknown parameters are found by setting the partial derivatives of the log likelihood function equal to zero and solving for the four parameters in terms of transition counts[2]. The first term can be ignored if the sample size is large and the maximum likelihood estimates are equal to the sample probabilities ($\lambda_{11} = \frac{N_{11}}{N_{11} + N_{12} + N_{13}}$). Table 3a shows the transition probabilities of value and growth stocks. The probability that a stock belonging to the 30% group with the lowest BM will stay in that category in the next period is 71.8%. The probability that a stock that belongs to the group with the 30% highest BM stays within that group in the next period is 68.4%. Table 3b represents the number of stocks that each category contains over the formation period 1973 to 1996. The number of stocks is less than in table 3a, because there is no overlap, which you do find in the Markov model. For example, a stock that starts as a growth stock in 1980 and stays a growth stock till 1981 is called a two-year growth stock. In formation year 1981, this stock will not be reckoned as a growth stock. The total number of value and growth stocks is almost the same. The number of fixed-growth stocks is somewhat higher compared to the number of the fixed-value stocks. On the other hand, the number of switching-value stocks is higher than the number of switching-growth stocks.

Table 3a: Markov-transition probabilities for the formation period 1973 to 1996

Previous State	**Next State**		
	0>BM≤30% (growth)	**30%<BM≤70%**	**BM>70% (value)**
0<BM≤30%	0.718	0.236	0.046
30%<BM≤70%	0.182	0.565	0.253
BM>70%	0.049	0.268	0.684

[2] $L(S_T, \Lambda', \pi) = \log \pi + \sum_{ij=11}^{33} N_{ij} \log \lambda_{ij} + M_{ij} \log(1 - \lambda_{ij})$, where S_T is the realization of $\{I_t\}$ and π is the probability of the initial state.

Table 3b: Overview of the number of stocks that are in each group after classifying them on the period that these stocks stay within each style over the period 1973 to 1996.

	Growth	Value
Switching-style stock	1500	1952
2 years-style stock	887	1250
3 years-style stock	564	380
Fixed-style stock	1269	977
Total	4220	4559

4 Results

In this paragraph we test whether returns in the five years after ranking the stocks are systematically larger for switching than for fixed-style stocks. We have only included stocks that have at least sixty months of return data. We collect the returns of June at year t till May of year $t+5$. To ensure that the accounting variables are known before we followed the same procedure as Fama and French (1992) by matching the accounting data of December t-1 with the returns of July in year *t*. The gap of six months between the fiscal data (December t-1) and the returns (June t) is conservative, because earlier work (e.g., Basu (1983) assumes that accounting data are available within three months of fiscal year ends.

If we assume that the book value of equity per share is constant the price change should be responsible for the style-switch that stocks make. Thus we expect that the returns are higher at the time that a stock changes from style for value stocks and that the returns are lower for growth stocks. As expected, the results indicate that the returns of switching-value stocks are substantially higher than switching-growth stocks in the first year after formation. Table 4 contains the average returns for the period of five years and the average returns adjusted for size-effects.

Lakonishok *et al.* (1994) analyze the performance of investment strategies over horizons of five years. They find that the superior returns of value strategies persist for at least five years. We find that the substantially larger returns for switching stocks hold only for two years. In the second year after formation the magnitude of the differences in returns between switching- and fixed-style stocks is lower. Table 4 represents earnings announcement returns and the annual buy-and-hold returns for switching and fixed-style stocks. The 20-quarterly earnings announcement returns are equally-weighted 3-day (t-1,t+1) buy-and-hold returns calculated for each stock for which data is available. For each post formation year we annualize the announcement returns by summing up the four quarterly event returns. For example, table 4 shows the announcement returns for the first year after formation, Q1-Q4, which represents the average of the sample of 24 formation years of the sum of the 4 quarterly announcement returns. The t-statistics are calculated following Fama and MacBeth (1973) over the difference between the switching-value and switching growth stocks and the fixed-value and fixed-growth stocks. Table 4 shows that in the first year after formation the switching-value stocks have an average annual return of 33.0%. In the second year after formation this group has an average annual return of 13.9%. For switching-growth stocks the annual return is in –22.3% year +1 and in 9.9% in year +2. The differences in annual returns between the switching-value and switching-growth stocks are 55.3% in year +1 and 4.0% in year +2. For the fixed-style stocks the results show the opposite. The returns of the fixed-value stocks are substantially lower than the fixed-growth stocks in the first three years after formation. In year +1 the difference in return between the value and growth fixed-style stocks is 31.0%. In the second and third year after formation similar results are obtained although the magnitude of the differences is smaller. In summary, the switching-value stocks are the stocks, which cause the value-premium and the fixed-growth stocks are the stocks, which cause the growth-premium.

If the errors-in-expectations hypothesis is true the earnings announcement returns must be positive for switching-value stocks and negative or zero for fixed-value stocks. Table 4 supports this hypothesis. This also means that the market realizes that

earnings or sales growth rates for the switching-value stocks, which are responsible for the value premium, are higher than investors initially expected. On the other hand, if the error in expectation hypothesis holds the expectations for the fixed-value stocks were low and these firms show low growth rates after formation. The event returns must be zero or negative. Our results show that the event returns are negative for fixed-value stocks, which means that the growth rates are even lower than investors already expected. The results show that the event returns for switching-value stocks are higher in the first years after formation than for fixed-value stocks. In year +1 the cumulative event return is +1.4% for switching-value stocks and –2.3% for the fixed-value stocks. This is an indication that the investors are disappointed about the earnings performance of fixed-value stocks and are **nicely surprised** about the earnings performance of switching-value stocks. The difference of +3.7% over only 12 trading days in year +1 represents 9.4% of the 39.2% difference in annual returns of the switching and fixed-value stocks. The difference in event returns with respect to annual buy-and hold returns is 22.2% in year +2. The difference in announcement returns of value stocks is mean-reverting after the third year of formation.

The errors-in-expectation hypothesis implies that the expectations of investors about growth rates were too extreme and that investors revise them after new information is revealed. For fixed-growth stocks the hypothesis states that investors are right in their expectations about future. The event returns must be negative for switching-growth stocks and positive or zero for fixed-growth stocks. In year +1 the cumulative event return is –1.4% for switching-growth stocks and 4.3% for fixed-growth stocks. The difference between both is +5.7% and is equal to 12.1% in year +1 of the total annual buy-and-hold returns. The difference in event returns is 0.7% in year +2 and 0.9% in year +3. This means that earnings announcement returns explain 6.3% in year +2 and 33.3% in year +3 of the annual buy-and-hold returns. After the third year the difference in announcement returns between switching-and fixed-growth stocks mean-reverts.

La Porta *et al*. (1997) report that for value and growth stocks the difference in event returns is 33 % in year +1, 27.1 % in year +2 and 22.5% in year +3 of the annual buy-

and-hold returns, respectively. Our results show similar outcomes for fixed-value and fixed-growth stocks. The differences in event returns are 6.5% in year +1, 1.6% in year +2 and 0.5% in year +3. This means that from the annual buy-and-hold returns 21% is explained by earnings announcement returns in year +1, 9.9% in year +2 and 6.6% in +3. A similar result is obtained for the first year after formation for the switching- value and switching-growth stocks. However, the magnitude of the difference in announcement returns is lower. From table 4 we see that the earnings announcement returns difference between switching value and switching-growth stocks is 1.1% in year +1, 1.0% in year +2 and –1.4% in year +3. The difference in announcement returns represents only approximately 2.0% of the annual buy-and-hold return differences in the first year after formation. Size-adjusted event returns show the same results, but with even smaller magnitudes. Hence, contrary to La Porta *et al*. (1997), we can conclude that that the value premium created by the switching-style stocks cannot be explained by announcement returns. The difference in event returns for the fixed-style stocks explains one-fifth of the difference in buy-and-hold returns in the first year after formation.

Table 4: Annual Cumulative Earnings Announcement returns and annual buy-and-hold returns on switching versus fixed-style stocks over the formation period 1973 to 1996

BM	**Value**		**Growth**		**Difference**		**t-statistics for difference**	
Period	Switching-style stock	Fixed-style stock	Switching-style stock	Fixed-style stock	Switching-style stock	Fixed-style stock	Switching-style stock	Fixed-style stock
Announcement returns								
Q01-Q04	0.014	-0.023	-0.014	0.043	0.011	-0.065	1.803*	-3.607**
Q05-0Q8	0.022	0.002	0.011	0.018	0.010	-0.016	0.588	-0.888
Q09-Q12	-0.006	0.012	0.008	0.017	-0.014	-0.005	-1.199	-0.342
Q13-Q16	0.024	0.034	0.012	0.001	0.011	0.033	1.444	1.901*
Q17-Q20	-0.008	0.023	0.022	-0.006	-0.030	0.029	-2.034	2.325**
Size-adjusted announcement returns								
Q01-Q04	0.002	-0.033	-0.025	0.033	0.010	-0.066	1.611	-3.379**
Q05-0Q8	0.011	-0.008	-0.006	0.010	0.016	-0.018	0.969	-0.993
Q09-Q12	-0.015	0.001	0.000	0.011	-0.015	-0.010	-1.254	-0.725
Q13-Q16	0.019	0.025	0.005	-0.008	0.014	0.034	1.819*	1.895*
Q17-Q20	-0.016	0.019	0.016	-0.014	-0.032	0.033	-2.070**	2.626**
Annual returns								
+1	0.330	-0.062	-0.223	0.248	0.553	-0.310	10.541**	-7.857**
+2	0.139	0.048	0.099	0.210	0.040	-0.162	1.290	-4.863**
+3	0.144	0.029	0.078	0.105	0.065	-0.076	1.581	-1.744
+4	0.036	0.105	0.089	0.006	-0.053	0.098	-1.281	2.333**
+5	0.047	0.140	0.069	0.029	-0.022	0.111	-0.612	1.896*
Size-adjusted annual returns								
+1	0.235	-0.159	-0.345	0.161	0.581	-0.319	13.537**	-8.515**
+2	0.011	-0.082	-0.036	0.099	0.047	-0.182	1.618	-6.178**
+3	0.025	-0.095	-0.038	0.005	0.063	-0.100	1.592	-2.574**
+4	-0.050	0.020	-0.006	-0.097	-0.045	0.117	-1.068	2.819**
+5	-0.039	0.060	-0.025	-0.071	-0.014	0.131	-0.429	2.511**

We expect from the errors-in-expectations hypothesis that the fixed-style stocks may be companies with no mean reversion in expected growth rates and that the switching-style stocks show mean reversion after one or two years. For a switching-value stock this implies that the past growth was low and would be higher in case the value stock switches one year after formation. Hence, investors extrapolate past growth too far in to the future and change their opinion when good news is released about growth rates of earnings. For the switching-growth stocks the opposite is valid, they had high growth in the past and are expected to show lower growth after the style-change. If the errors-in-expectations hypothesis is true the growth rates of fixed-style stocks won't change over the examined period of five years.

In order to find evidence for the errors-in-expectation hypothesis we have to compare the actual growth rates with the past growth rates and with the expected growth rates as implied by the ratios. We use sales growth and earnings growth as a proxy for past growth rates like Lakonishok, Shleifer and Vishney (1994). If expectations of switching growth stocks are too extreme then the sales growth in the year of the style-switch and the year after the style-switch should be lower. For switching-value stocks the opposite must be the case, sales growth must increase in the year of the style-switch and the years after style-switch. Table 5 presents the median sales and earnings growth rates for the switching and fixed-style stocks for each year. We show median growth rates instead of average growth rates, to avoid the emphasize on firms with extreme earnings growth rates of for example +800%. Examples of such firms are start-up firms, which have very small earnings in the beginning. The outcomes show differences in post formation growth rates between switching and fixed-style stocks. In year +1, the earnings growth rates of fixed-growth stocks are higher than for switching-growth stocks. The difference in earnings growth rates is 18.5% in year +1 (sales growth rate difference is 9.0%). Opposite results are found for value stocks, the switching-value stocks have higher earnings growth rates than the fixed-value stocks the year after formation. The difference in earnings growth rates is 9.2% (2.6% sales growth) in year +1. It seems that the

earnings and sales growth rates have explanatory power with respect to style-switching behavior.

Table 5: Earnings and sales growth for switching- and fixed-style stocks from the year of formation till the year of the style-switch.

	Sales growth (median)					
Value	+0	+1	+2	+3	+4	+5
Switching-style stock	0.067	0.075				
2 years-style stock	0.099	0.096	0.090			
3 years-style stock	0.047	0.051	0.061	0.099		
Fixed-style stock	0.041	0.049	0.052	0.056	0.058	0.051
Growth						
Switching-style stock	0.115	0.090				
2 years-style stock	0.158	0.126	0.101			
3 years-style stock	0.212	0.164	0.121	0.078		
Fixed-style stock	0.190	0.181	0.178	0.158	0.125	0.116
	Earnings growth (median)					
Value	+0	+1	+2	+3	+4	+5
Switching-style stock	0.046	0.071				
2 years-style stock	0.079	0.029	0.209			
3 years-style stock	-0.068	0.033	0.147	0.232		
Fixed-style stock	-0.053	-0.020	0.034	0.070	0.088	0.160
Growth						
Switching-style stock	0.223	0.146				
2 years-style stock	0.200	0.257	0.112			
3 years-style stock	0.365	0.391	0.248	0.005		
Fixed-style stock	0.243	0.331	0.233	0.220	0.149	0.124

Summary and conclusions

In this paper we show that the value premium is caused by only a small number of value stocks: switching-value stocks are responsible for the so-called value premium

the year after formation. We build on the studies of La Porta (1996) and La Porta *et al.* (1997) to distinguish between stocks within a particular style.

The errors-in-expectation hypothesis implies that the expectations of investors about growth rates were too extreme and that investors revise them after new information is revealed. For fixed-growth stocks the hypothesis states that investors are right in their expectations about future. This means that for value stocks the event returns must be positive when they switch from style. Thus the first year after formation the announcement returns should be positive for switching-value stocks and negative for fixed-value stocks. For switching-growth stocks the event returns must be negative and positive or zero for fixed-growth stocks.

We find support for the expectational error hypothesis. The higher returns in the year that value stocks switch from style coincide with positive earnings announcement returns and higher earnings growth rates. For growth stocks we find that when they switch from style the announcement returns are negative and earnings growth rates are lower. Although, the announcement returns are positive when value stocks switch from style, the magnitude of the difference in announcement returns between switching-value and switching-growth stocks is small with respect to the difference between the annual buy-and-hold returns. It only explains a small fraction of the difference in annual buy-and-hold returns. For the fixed-style stocks the difference in announcement returns explain a large fraction of the difference in annual buy-and-hold returns. In summary, we conclude that the value premium created by the switching-style stocks cannot be explained with announcement returns. On the other hand the growth-premium can be explained with announcement returns. Further research is maybe useful to analyze time-series of announcement returns.

This supports the view that it is difficult to distinguish firms with lots of growth opportunities from overvalued growth stocks. A growth stock represents a company, which depends on future growth options. Valuing these growth companies, investors must rely on more subjective information and the overconfidence-related mispricing-effect should be stronger than for stable companies. These stocks have more growth options and the prices of these stocks should exhibit stronger overconfidence effects. Switching-growth stocks may reflect the excessive market

optimism about future profitability of companies resulting from overreaction to past good news, while fixed-growth stocks reflect stocks where the optimistic expectations are justified.

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Appendix

A1: Annual Earnings Announcement returns and annual buy and hold returns on switching versus fixed-style stocks

Announcement returns (t-1,t+1)

Value						**Growth**				
	Q1-Q4	Q5-Q8	Q9-Q12	Q13-Q16	Q17-Q20	Q1-Q4	Q5-Q8	Q9-Q12	Q13-Q16	Q17-Q20
Switching-style stock	0.014	0.022	-0.006	0.024	-0.008	-0.014	0.011	0.008	0.012	0.022
2 years-style stock	0.006	0.042	0.004	0.006	0.030	-0.013	-0.023	-0.003	0.027	0.040
3 years-style stock	0.001	0.013	0.007	0.041	0.019	0.050	-0.008	-0.006	-0.014	0.000
Fixed-style stock	-0.023	0.002	0.012	0.034	0.023	0.043	0.018	0.017	0.001	-0.006
Difference between value and growth event returns								**t-statistics**		
Switching-style stock	0.011	0.010	-0.014	0.011	-0.030	**1.803***	0.588	-1.199	1.444	-2.034
2 years-style stock	0.019	0.065	0.006	-0.022	-0.011	1.385	**3.622****	0.353	-1.381	-0.682
3 years-style stock	-0.049	0.020	0.013	0.055	0.019	-2.383**	1.092	**0.849**	2.194**	1.081
Fixed-style stock	-0.065	-0.016	-0.005	0.033	0.029	-3.607**	-0.888	-0.342	**1.901***	**2.325****
Size-adjusted announcement returns										
	Q1-Q4	Q5-Q8	Q9-Q12	Q13-Q16	Q17-Q20	Q1-Q4	Q5-Q8	Q9-Q12	Q13-Q16	Q17-Q20
Switching-style stock	0.002	0.011	-0.015	0.019	-0.016	-0.025	-0.006	0.000	0.005	0.016
2 years-style stock	-0.003	0.034	-0.007	-0.002	0.026	-0.029	-0.031	-0.015	0.017	0.034
3 years-style stock	-0.014	0.005	0.003	0.032	0.013	0.038	-0.018	-0.013	-0.017	-0.009
Fixed-style stock	-0.033	-0.008	0.001	0.025	0.019	0.033	0.010	0.011	-0.008	-0.014
Difference between value and growth size-adjusted event returns								**t-statistics**		
Switching-style stock	0.010	0.016	-0.015	0.014	-0.032	1.611	0.969	-1.254	1.819*	-2.070**
2 years-style stock	0.026	0.065	0.009	-0.019	-0.008	1.727	4.267**	0.370	-1.420	-0.330
3 years-style stock	-0.052	0.023	0.016	0.050	0.022	-2.408**	1.197	1.100	1.924*	1.297
Fixed-style stock	-0.066	-0.018	-0.010	0.034	0.033	-3.379**	-0.993	-0.725	1.895*	2.626**

Annual returns										
	Q1-Q4	Q5-Q8	Q9-Q12	Q13-Q16	Q17-Q20	Q1-Q4	Q5-Q8	Q9-Q12	Q13-Q16	Q17-Q20
Switching-style stock	0.330	0.139	0.144	0.036	0.047	-0.223	0.099	0.078	0.089	0.069
2 years-style stock	-0.039	0.426	0.101	0.094	0.131	0.137	-0.220	0.020	0.110	0.067
3 years-style stock	-0.073	0.077	0.398	0.032	0.106	0.287	0.057	-0.241	-0.017	0.043
Fixed-style stock	-0.062	0.048	0.029	0.105	0.140	0.248	0.210	0.105	0.006	0.029
Difference between value and growth annual returns						**t-statistics**				
Switching-style stock	0.553	0.040	0.065	-0.053	-0.022	10.541**	1.290	1.581	-1.281	-0.612
2 years-style stock	-0.176	0.645	0.080	-0.017	0.064	-3.193**	12.417**	1.392	-0.227	1.241
3 years-style stock	-0.360	0.020	0.640	0.049	0.064	-6.132**	0.430	8.569**	0.750	0.940
Fixed-style stock	-0.310	-0.162	-0.076	0.098	0.111	-7.857**	-4.863**	-1.744	2.333**	1.896*
Size-adjusted annual returns										
	Q1-Q4	Q5-Q8	Q9-Q12	Q13-Q16	Q17-Q20	Q1-Q4	Q5-Q8	Q9-Q12	Q13-Q16	Q17-Q20
Switching-style stock	0.235	0.011	0.025	-0.050	-0.039	-0.345	-0.036	-0.038	-0.006	-0.025
2 years-style stock	-0.129	0.314	-0.006	0.014	0.044	0.015	-0.331	-0.077	0.028	-0.023
3 years-style stock	-0.166	-0.043	0.281	-0.052	0.002	-0.070	-0.071	0.077	-0.115	-0.070
Fixed-style stock	-0.159	-0.082	-0.095	0.020	0.060	0.161	0.099	0.005	-0.097	-0.071
Difference between value and growth annual returns						**t-statistics**				
Switching-style stock	0.581	0.047	0.063	-0.045	-0.014	13.537**	1.618	1.592	-1.068	-0.429
2 years-style stock	-0.144	0.644	0.071	-0.014	0.067	-2.747**	10.780**	1.353	-0.196	1.285
3 years-style stock	-0.096	0.029	0.204	0.063	0.072	-5.280**	0.661	8.474**	0.816	0.670
Fixed-style stock	-0.319	-0.182	-0.100	0.117	0.131	-8.515**	-6.178**	-2.574**	2.819**	2.511**

A2: Earnings and sales growth for switching- and fixed-style stocks from the year of formation till the fifth year after formation.

	Sales growth (median)					
Value	+0	+1	+2	+3	+4	+5
Switching-style stock	0.067	0.075	0.079	0.076	0.072	0.070
2 years-style stock	0.099	0.096	0.090	0.091	0.092	0.085
3 years-style stock	0.047	0.051	0.061	0.099	0.063	0.065
Fixed-style stock	0.041	0.049	0.052	0.056	0.058	0.051
Growth						
Switching-style stock	0.115	0.090	0.100	0.101	0.090	0.081
2 years-style stock	0.158	0.126	0.101	0.104	0.100	0.093
3 years-style stock	0.212	0.164	0.121	0.078	0.082	0.083
Fixed-style stock	0.190	0.181	0.178	0.158	0.125	0.116
	Earnings growth (median)					
Value	+0	+1	+2	+3	+4	+5
Switching-style stock	0.046	0.071	0.161	0.152	0.116	0.138
2 years-style stock	0.079	0.029	0.209	0.250	0.163	0.134
3 years-style stock	-0.068	0.033	0.147	0.232	0.212	0.133
Fixed-style stock	-0.053	-0.020	0.034	0.070	0.088	0.160
Growth						
Switching-style stock	0.223	0.146	0.085	0.138	0.150	0.121
2 years-style stock	0.200	0.257	0.112	0.064	0.132	0.102
3 years-style stock	0.365	0.391	0.248	0.005	0.055	0.108
Fixed-style stock	0.243	0.331	0.233	0.220	0.149	0.124