Is the Market Held by Institutional Investors?
The Disposition Effect Revisited.

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Is the Market Held by Institutional Investors? The Disposition Effect Revisited

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Abstract

Czarnitzki and Stadtmann (2005) measure the interdependence of demand for investment advice (approximated by sales of investor magazines) and stock prices. They find strong evidence that confirms the presence of the disposition effect, i.e. the empirical observation that investors sell winners (too) early and abide losers (too) long. We re-investigate their findings and confirm that the effect is very well present in the formerly analyzed time frame, but clearly wears off afterward. As an explanation for the decline, we provide three lines of argumentation and show that disposition effect might dependent on the shareholder structure, which is in line with the theory.

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1   Introduction

It is a "stylized fact" of empirical financial market observation that investors tend to close profitable positions too early, while they hold lossy positions too long (Odean, 1998). In aggregation, this results in higher portfolio turnovers in bull markets compared to bear markets. That stylized fact is known as the disposition effect, as e.g. Grinblatt and Han (2002) describe. Da Costa et al. (2013) analyze whether the disposition effect is stronger in times when there are rather many inexperienced private investors in the market than in times when mostly institutional investors participate. They find that during bullish times, small private investors bring a good share of the observed disposition effect into the market, while in bearish times, private investors are mostly absent and thus, disposition effect is less or even not at all significant.

Czarnitzki and Stadtmann (2005) argue that in bullish times, when lots of inexperienced private investors participate and disposition effect should be present, the demand for investment advice is up. They approximate the demand for investment advice by sales of investor magazines in the German market. In Germany, one of the leading magazines is "Börse online", which has been issued since 1987. Czarnitzki and Stadtmann (2005) show that sales of "Börse online" are strongly positively linked to the stock market development, approximated by the German prime standard, "DAX" (Deutscher Aktienindex). While controlling for inflation and income, this interdependency can very well be interpreted as strong evidence for the presence of the disposition effect: In bullish situations, demand for investment advice is up.

We extend the time frame investigated by Czarnitzki and Stadtmann (2005) with updated data and analyze whether the link between demand for investment advice and the market development is still present. We find that it is not and therefore provide three different explanations for the decline of the formerly observed interdependency. The remainder of the paper is structured as follows: Section 2 sheds some more light on disposition effect theory. Section 3 discusses the empirical analysis. Section 4 concludes.

2   Disposition and Demand for Financial Advice

Disposition effect is predicted by prospect theory, an alternative to the theory of expected utility. Prospect theory has been described by nobel laureate Kahneman and Tversky (1979) and Kahneman and Tversky (1992). According

to the prospect theory, individuals exhibit a sigmoidal shaped value curve. In the profit zone, the subjective value function is concave, suggesting that additional wins are assessed only disproportionately. In the deficit zone however, the function is convex and even shows a steeper slope. After all, there is risk aversion in the profit zone and risk proclivity in the deficit zone. The idea behind that is that once a profit has been reached for a given investment, investors are afraid of losing it again and therefore, tend to realize the profit, i.e., to close the position. On the other hand, if there is a deficit, investors are afraid of admitting their mistake and rather choose not to close the position but to keep it running, even if it loses more and more value. They calm themselves by the argument that this is only a paper loss instead of a real loss and hope for the investment to turn back into the profit zone eventually at some time in the future. After all, investors tend to show a behavior of risk proclivity in the deficit zone by not closing lossy positions and hoping for the future instead.

This idea is closely related to the regret theory of Shiller (1999): Here, investors are also reluctant to close lossy positions, mostly because they have to admit that their first assessment was wrong. Thus, their regret guides their behavior. As investors that are driven by sentiment – either regrets or prospects – adjust their portfolio more frequently in winning times than in deficiency times (they close winning positions and then need to re-invest somewhere else), a positive interdependency between demand for investment advice and market development should indicate the presence of the disposition effect. Czarnitzki and Stadtmann (2005) proxy the demand for advice by sales of "Börse online" magazine. Data are available at `www.pz-online.de`. The market development is measured by the "DAX" index, where Germany's 30 leading stock companies are listed.

3 Empirical Analysis

We acquired weekly data in the time frame from calender week 33, 1998 (August) to calender week 13, 2010 (April). As Figure 1 overwhelmingly shows, there had been a severe change in the interdependency between sales of "Börse online" and DAX around the beginning of 2003. Thus, we split the sample into a sub sample that spans from August 1998 to December 2002 (this sub sample mostly covers the time frame analyzed by Czarnitzki and Stadtmann (2005)) and a second sub sample for the remaining period, i.e.

January 2003 to April 2010.

For each of the (sub)sample data sets, we use ADF tests to find that both $SALES$ and DAX are integrated of order one. Thus, we run GMM estimates, cross-check with first difference OLS estimates and check for cointegration in each constellation. As subscribers of "Börse online" are not able to change their demand for investment magazines on a weekly basis, we generate an additional variable that contains "net sales", i.e. total sales minus subscribers. Additionally, to control for inflation and income, we take the consumer price index (CPI) and the index of industrial production (INC) into account.

Model I explains sales by lagged sales, DAX, CPI and INC. Model II explains net sales by lagged net sales, DAX, CPI and INC. Models I and II are estimated by GMM. Models III and IV are built identically to models I and II, but are estimated by first difference OLS, i.e. regressand and all regressors have been differentiated. All of the four models have been run for the first sub sample data set, the second sub sample and the whole sample.

Table 1 shows the results for the first sub sample time frame. As can be seen, $SALES$ (or "net sales", respectively) can be significantly explained by its lags and DAX. All effects show the expected algebraic signs (positive lag- and DAX-effects in levels, but negative lag-effects in first differences). Phillips-Ouliaris tests reject the null hypothesis of cointegration. After all, both GMM estimates and first difference OLS estimates confirm the results of Czarnitzki and Stadtmann (2005): Disposition effect is quite visible.

In Table 2, results for the second time frame are displayed. DAX is not a significant explanatory variable anymore in any constellation. In levels, not even lags are significant anymore. In first differences, lags are significant and show the expected algebraic signs. However, disposition effect is clearly absent.

Results for the total sample are presented in Table 3. Wherever the relationship between dependent variable and DAX is significant, algebraic signs are as expected. However, not all effects are significant. Instead, control variables and intercept become significant in several cases. After all, in the case of the total time frame, there is clearly a structural break present (the empirical value of a Chow breakpoint test at January 2003 is 90.9116), so results for the total time frame are to be interpreted with caution.

Three short explanations should be provided to explain the change in the observed structure over time:

1. **The shareholder structure might have changed.** The so-called "dot-com-bubble" began to burst in the year 2000. Many small investors had

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been present at the market, which might even had been an important catalyst for to crisis' uprise. During the aftermath of the crash, many of these small investors lost a good share of their assets. So far, it is common sense that many of these investors were rejected from their experience, and thus left the market for good. Ofek and Richardson (2003) provide some evidence on that. After the crisis was finally over and the market began to recover by the beginning of 2003, a good fraction of small private investors had left, never to return back to investments. The structure had changed, the fraction of inexperienced investors (who are prone to disposition effect) had diminished. The market was now in the hand of institutional investors, who act on strongly rule-based decision patterns and thus, are not prone to disposition effect to the same extent as private investors.

2. **There might have been a severe change in the investment related press.** "Börse online" had been one of the most important topic related magazines during the time frame investigated by Czarnitzki and Stadtmann (2005). However, there were substitutes available: The magazine "DM" got renamed (first "DM Euro", later "Euro") and changed its focus, now dealt much more with investment related analyses and tips. The magazine even got relaunched in 2004, when publisher "Axel Springer" acquired the magazine and issued its own magazine "Finanzen" using the acquired name "Euro". Also, "Der Aktionär" switched from monthly to weekly publication in 2000 and possibly attracted many readers, as it had had a peak print run of about 140,000 in the first quarter of 2000. Similar developments had been observed for other magazines as well, e.g. "Telebörse", "Focus Money", "Capital" or "Wirtschaftswoche" (for all data, see `goo.gl/vqakJ`). Daily papers were also competitors for weekly magazines: "Handelsblatt" has had large print runs since its first issue in 1946. In 2000, a second important daily paper ("Financial Times Deutschland", FTD) came up (FTD had been discontinued in December 2012). After the burst of the dot-com-bubble, most of these papers and magazines lost a lot of readers, print runs went down. This might be an alternative explanation for the observed separation of "Börse online" sales from DAX development.

3. **Press scene may have changed.** Necessary information are available much more broadly in the internet than it had been the case in the years around the millennium change. Available services are used frequently. For example, `www.boerse-online.de`, `www.boerse.de` and

`www.boersenblatt.net` constantly share a total of visits of more than 2.5 millions per day (data from `http://www.ivw.eu/`). Real time stock information are available for free, e.g. at `http://www.onvista.de/` or `http://finance.yahoo.com/`. After all, investors are much less dependent on press sources for investment decisions. $SALES$ of "Börse online" decline even during periods of increasing stock prices by the beginning of 2003. Maybe the reason is that investors substitute magazines by free internet services.

[INSERT FIGURE 1 ABOUT HERE]
[INSERT TABLE 1 ABOUT HERE]
[INSERT TABLE 2 ABOUT HERE]
[INSERT TABLE 3 ABOUT HERE]

4 Conclusion

We investigate the presence of the disposition effect in the German investment market. By analyzing the link between sales of the leading investment magazine "Börse online" and aggregated stock prices, we find that disposition effect is present during the time frame formerly investigated by Czarnitzki and Stadtmann (2005). However, we show that the effect is clearly absent in the consecutive time frame. We provide three qualitative explanation approaches, among other things, the theory that there had been a shift of shareholder structure. That theory is supplemented by empirical research and might be a probable explanation for the current absence of the disposition effect.

Methods	Model I	Model II	Model III	Model IV
	Levels GMM	Levels excluding subscriptions GMM	First differences OLS	First differences excluding subscriptions OLS
$SALES_{t-1}/1000$	1.0465*** (8.2117)		-0.1516** (-2.384)	
$(SALES_{t-1} - SUBSCR_{t-1})/1000$		1.0787*** (11.792)		-0.1796*** (-2.7)
$DAX_t/1000$	11.323*** (11.315)	13.155** (1.7284)	13.886*** (3.4)	13.7357*** (3.377)
CPI_t	14.874 (1.0987)	-7.6342 (-0.7376)	1.7712 (0.351)	1.8454 (0.367)
INC_t	-7.9902 (-1.1575)	4.8602 (0.9557)	-0.43 (-0.369)	-0.4793 (-0.413)
Intercept	-723.85 (-1.0376)	292.05 (0.5323)	-0.1516 (-0.213)	-0.1397 (-0.197)
N	226	226	227	227
R^2	0.8859	0.9505	0.0706	0.0771
Instruments	$SALES_{t-2}$ $SALES_{t-3}$	$SALES_{t-2}$ $SALES_{t-3}$		
Phillips-Ouliaris test	-17.5488	-14.6533		
p value	0.0912	>0.15		

Note: t values in parenthesis. ***, ** and * represent significance at 1%, 5% and 10% level.

Table 1. Estimates for time frame August 1998 to December 2002.

Methods	Model I	Model II	Model III	Model IV
	Levels GMM	Levels excluding subscriptions GMM	First differences OLS	First differences excluding subscriptions OLS
$SALES_{t-1}/1000$	0.897 (1.6318)		-0.3833*** (-8.282)	
$(SALES_{t-1} - SUBSCR_{t-1})/1000$		1.1351 (1.2269)		-0.3938*** (-8.358)
$DAX_t/1000$	0.1627 (0.1211)	-0.6223 (-0.2592)	-1.8194 (-1.298)	-1.8364 (-1.312)
CPI_t	-0.2743 (-0.1382)	-1.6552 (-1.0943)	0.8455 (0.833)	0.8589 (0.847)
INC_t	0.0261 (0.1683)	0.1999** (2.3569)	-0.1577 (-0.785)	-0.1648 (-0.822)
Intercept	34.9383 (0.1475)	188.2062 (0.9932)	-0.2082 (-1.122)	-0.1810 (-0.978)
N	376	376	377	377
R^2	0.8551	0.7801	0.1609	0.1633
Instruments	$SALES_{t-2}$ $SALES_{t-3}$	$SALES_{t-2}$ $SALES_{t-3}$		
Phillips-Ouliaris test	-21.5942**	-87.9384***		
p value	0.04169	<0.01		

Note: t values in parenthesis. ***, ** and * represent significance at 1%, 5% and 10% level.

Table 2. Estimates for time frame January 2003 to April 2010.

Methods	Model I	Model II	Model III	Model IV
	Levels GMM	Levels excluding subscriptions GMM	First differences OLS	First differences excluding subscriptions OLS
$SALES_{t-1}/1000$	1.3638*** (3.376)		-0.1976*** (-4.983)	
$(SALES_{t-1} - SUBSCR_{t-1})/1000$		0.829*** (5.2255)		-0.2211*** (-5.47)
$DAX_t/1000$	-7.7941 (0.8324)	0.146*** (4.6779)	6.5708*** (3.325)	6.4483*** (3.276)
CPI_t	5.0575 (0.921)	-7.8008*** (-4.7021)	1.2429 (0.709)	1.265 (0.724)
INC_t	0.2269 (0.39)	-0.2478 (-0.2568)	-0.2678 (-0.744)	-0.2821 (-0.787)
Intercept	-488.85 (-0.913)	799.32*** (6.8628)	-0.2384 (-0.809)	-0.2227 (-0.758)
N	605	605	606	606
R^2	0.9413	0.9167	0.0572	0.0648
Instruments	$SALES_{t-2}$ $SALES_{t-3}$	$SALES_{t-2}$ $SALES_{t-3}$		
Phillips-Ouliaris test	-3.2858	-13.4632		
p value	>0.15	>0.15		

Note: t values in parenthesis. ***, ** and * represent significance at 1%, 5% and 10% level.

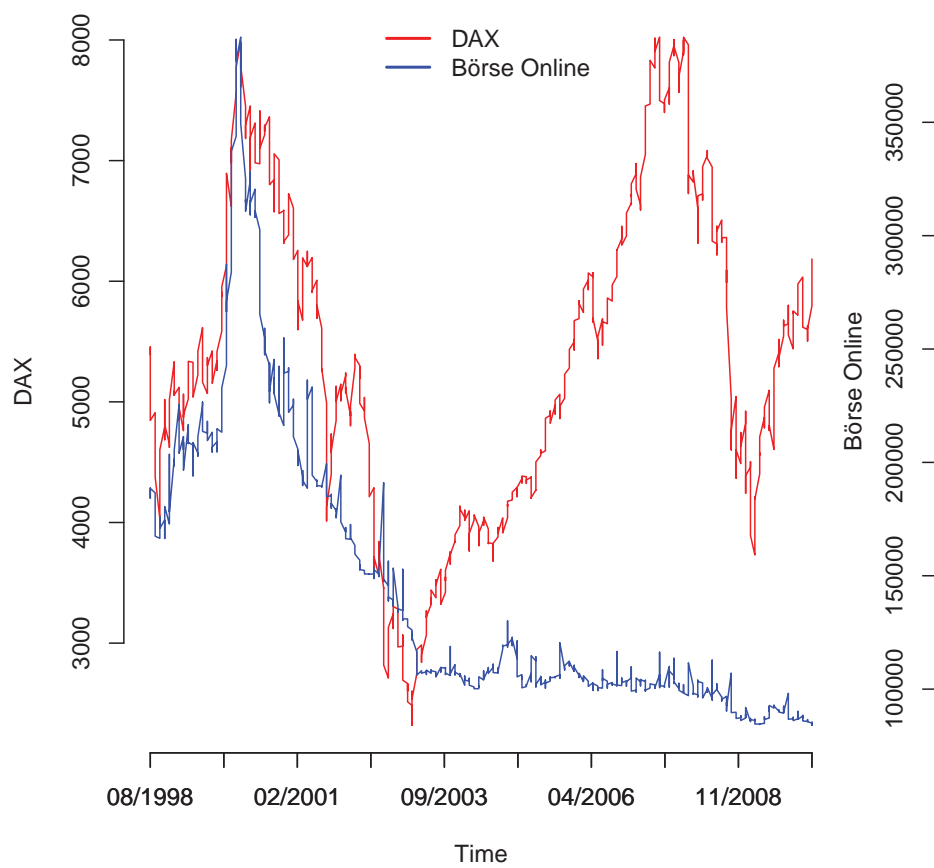Table 3. Estimates for time frame August 1998 to April 2010.

Figure 1. DAX versus sales of "Börse online" over time.

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