Wealth Growth Of Institutional Investors And Broad Money During The New Normal*

Jens Weidlich
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Abstract

In the past decades, broad money and invested monies are growing continuously in Germany. The nominal wealth is permanently rising. Does the broad money have an effect on invested capital of institutional investors during the “New Normal”? If yes, is there a direct impact channel to growth or an indirect one? How strong are these effects? This paper is investigating these questions and suggests that there is a positive impact on nominal wealth growth due to broad money growth. In addition financial shocks and other investment sector specifics are considered. In such cases, when crises and strong market movements take place simultaneously, broad money can have a negative impact on the wealth growth. A critical view of some risks of the monetary policy in regards to invested money is shown in this paper as well.

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I Introduction

With founding of stock exchanges in Germany, roughly in 1540 in Augsburg, investing money started a new era.\(^1\) Bonds, later equities too, could be traded much quicker than before. With the exchanges and due to technological progress, step by step, market participants have reached the trading and investing period, which exists today. In seconds, millions of Euros were traded and securities changed the owner. Complete sectors were created, which specialized in investing money for themselves or others.

With the decision to implement the Euro as the currency, the European Central Bank (ECB) was founded in 1998. It became necessary to combine the central bank tasks from Euro-member countries. In the past the ECB has permanently increased the broad money and carried on the trend of the former member central bank strategies. Researchers investigated that the willingness to borrow money is correlated with the broad money growth (cp. Grabau and Joebges 2013).

The purpose of this paper is to analyse the wealth growing in dependence of broad money. The assumption for the models is that the wealth growth rate depends on broad money through three channels (indirect with market growth and cash in- or outflows and direct with broad money growth by itself). The direct impact and the dimension will be discussed in regards to potential risks for investors.

For this paper, invested capital of institutional investors is observed.\(^2\) This is unique as data for institutional clients are not a matter of public record. Other researchers like Prather et al (2004) or Nitzsche et al (2010) investigate fund performance of mutual funds. In comparison to these papers the performance in detail is not the main focus on this study. This paper helps to understand, with empirical work, the effect of broad money to institutional investor’s wealth growing.

For the results, which are presented in this paper, data from different sources were used. Primary sources were a custodian bank and public data from OECD or Deutsche Bundesbank.\(^3\) With these information a panel data set could be created and models and regressions could be built.

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\(^1\) Cp. Pohl (1976)
\(^2\) By definition an institutional investor needs a business. Such investors are: banks, insurances, foundations, governance institutions, corporations, pension funds, associations, etc.
\(^3\) OECD: Organisation for Economic Co-operation and Development: http://www.oecd-ilibrary.org/; Deutsche Bundesbank: http://www.bundesbank.de/; the custodian bank does not want that the name is mentioned for this paper.
The time periods in scope are the years between 2007 and 2012. The whole period of time under observation was turbulent and could be treated as a time of crises. But two specific quakes shocked the financial markets and are known as the peaks of this time of crises. The first one was in 2008 when Lehman Brothers filed bankruptcy. The second shock was in 2011 after Greece lost the investment grade rating for their government bonds. This time of crises would be called in the world of bankers as the “New Normal”, which means that everything, which was called a crisis before, was now treated as normal and only big shocks are considered a crisis (as it was in 2008 and 2011). Beginning from now crises will be defined in this paper as these two peaks and no longer as period of time. These crises were considered in the models and regressions. The results of the paper suggest that a crisis has a very big negative impact to the average value growth of an institutional fund. In reverse broad money has a positive impact on the nominal wealth growth. But in case of crisis, the paper suggests that broad money has a negative effect due to leverage reasons, dependent on the market growth for relevant investments.

This paper is divided into six sections. Section II describes the background on investment funds and the historical growth of broad money and wealth of institutional investors in Germany. In section III the data and variables were introduced and the use of it for the theoretical framework in section IV. Here the models for the empirical work will be established. Afterwards, the models were tested and the results of the empirical data are presented in section V. Finally section VI and VII show some critical points and conclusions.

II Background on investment funds and historical growth

Investing money is playing a central role for wealth growing. Especially when ADIG (Allgemeine Deutsche Investmentgesellschaft) had founded the first mutual investment fund in Germany 60 years ago, private investors had an alternative to saving books. A mutual fund pools money from many different investors to invest in securities, commodities or real estates. Such funds are managed professionally by investment

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4 The crises began 2006 with first public asset backed securities (ABS) and mortgage issues at the market. Some authors determinate the start of crises in year 1997 cp. Crouhy et al (2008)
companies, like banks or financial advisory corporations. A big advantage of an investment fund is the diversification. As a pool the fund management can invest in many different assets. Every investor holds shares of this pool, in relation to his or her invested amount. So the investor is “owner” of a share of all securities or real assets. The risk (for example in case of default or liquidation) will be reduced in comparison to a direct investment in one single security. Normally all investors can increase or decrease their investment on a daily basis, all they have to do is buy or sell their units. Almost the same applies to an institutional fund where the number of investors are limited (normally there is one investor with at least five million EUR invested money) and restrictions by law can be lower. Both, private and institutional investors, have the choice where to invest in. There are many types of investment funds (e.g. for bonds, stocks, mixed portfolios, etc.). It depends on the investors risk aversion and the time when he or she is expecting to receive the investment back.

An important measure is the Net Asset Value (NAV) of a fund. This is the value of an entity’s assets less the value of its liabilities. Figure 1 shows the historical growth of the absolute netted NAV of all funds in Germany for mutual and institutional funds between 1980 and 2012. There can be seen that over the time the NAVs are growing continuously. At the end of 2012 the netted volume of all funds amounts to nearly one trillion EUR for institutional funds and approximately 750 billion EUR for mutual funds in Germany. This trend has many reasons: (1) in the past funds became generally known, so that the number of investors was rising. (2) Today investors have a bigger choice between investment company and fund types. An investor is also able to choose between regions, sectors or markets, where to invest. Overall the number of mutual funds, and with it the supply of funds, was raised from two funds in 1950 to 7529 in 2012.7 The same trend can be seen for institutional investors which grew from one fund in 1962 to 3919 in 2012. (3) The invested amount per investor was rising (for example due to a saving plan). (4) The market value of the underlying assets, in which a fund invests, was rising. In addition (5) there is a compounded interest effect for the investments.

For this paper the focus is on institutional funds. An advantage is that institutional investors are not depositing or withdrawing funds on a daily basis (as is the norm with mutual funds). This simplifies comparisons, if there is neither a cash flow in nor out during

the year, only the year-end amounts would need to be considered to determine the true growth of a NAV. In addition institutional investors have other ambitions than a private investor. If there was a crisis a private investor would get nervous about losing his or her money faster or in economic bad times it is possible that he or she would revert to his or her savings. On the other hand institutional investors, especially the pension funds, need the cash at a date further in the future, normally a distant time in the future. So the probability that cash outflows will take place is much lower than for private investors.

To get a better feeling of the trend of a NAV, Figure 2 shows the average NAV of institutional funds. Over time the average NAV is rising too. In addition to the named five reasons for the growing trend for all funds, the broad money growth for M3 could play an important role for the growth of a NAV. Broad money M3 includes among others, currency in circulation, overnight deposit, deposits with an agreed maturity of up to two years, deposits redeemable at notice of up to three months and marketable instruments. It’s the widest definition for broad money.

Figure 3 shows a nearly linear correlation between M3 and the average NAV. Creating a simple one dimensional OLS regression, using the average NAV and the broad money index results in Table 1. There it is shown: if the broad money index is raising by one index point the average NAV will rise by 1.44 million EUR. Certainly there does exist an omitted variable bias, the other reasons for NAV growth are missing, but M3 could affect the NAV of a fund in a direct channel (more in section III). To check this hypothesis a new regression model has to be created (more in section IV).

### III Data and Variables

For the main work of all analyses, the data used in this study is derived from the German arm of a major global custody bank. The data includes NAV of 632 German institutional funds, types of fund (equity, bond or mixed), cash in- and outflows for the years from 2007 to 2012. Due to the short life cycle of a fund, the data set has to be reduced for a balanced panel to 115 institutional funds. Table 2 shows that the combined NAV of these funds was 50 billion EUR, so the data set represents nearly 5% of the German institutional fund market. Overall approximately 20% of these funds are invested

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8 Cp. ECB Monthly Bulletin August 2013
in equities and 80% are invested in bonds.⁹

Using this data a dependent variable \( \delta_{\text{NAV},x,t} \) can be constructed which is the growth rate for the NAV of a fund \( x \) at time \( t \). With the bank panel data set dummy variables for the type of funds can be created. One for stock funds \( D_{S,x} \), which is equal to one, if a fund \( x \) is investing the main value in stocks, in other cases the dummy variable is zero.¹⁰ Another one for bond funds \( D_{B,x} \), which is equal to one, if fund \( x \) is investing the main value in bonds, else zero. Finally a dummy variable can be built for mixed funds \( D_{M,x} \), which is equal to one, if fund \( x \) is investing the main value in both, stocks and bonds, else zero. These dummy variables are time invariant and were created manually after viewing the top 100 positions of every single fund. Finally data of the yearly cash in- and outflows in the panel data were included. In the sample from 115 funds in seven points in time (805 observations) 158 times were observable a cash inflow and 107 times a cash outflow (Table 2). A dummy variable \( D_{\text{CI},x,t} \) can be built, which is equal to one, if a fund \( x \) has a cash inflow at time \( t \). In addition \( D_{\text{CO},x,t} \) can be created, which is equal to one, if fund \( x \) has a cash outflow at time \( t \).

Figure 4 shows that the broad money index for M3 with base year 2005 continuously grew over the past 40 years. Until the “New Normal” period the ECB has permanently increased the M3 growth rate up to a peak in 2007, after that M3 has been growing at a slower rate.¹¹ During this period the ECB decided to support the financial markets by guaranteeing bank liquidity and the program for redemption of government bonds. This market intervention is an indirect impact channel for the NAV growth by M3 growth, as there was more liquidity in the market the stock and bond prices were stabilized. Broad money should also have a direct effect to the growth of the NAV. Institutional Funds, which can mostly lend high amounts of money secured by collateral (based on the securities which the fund holds) are able to invest the borrowed money in new securities. They can do leverage by lending money in times of low interest rates and investing it in markets with expected higher yields than the interest rates of the borrowed monies. Especially in times, where M3 growth rate in the Euro-zone is high, the lending growth

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⁹ This is an assumption of the market for all years in scope. In Table 2, column four shows that in average 10% are invested in equity funds and app. 40% in bond funds. During the observed new normal time the risk should be lower than in former times. Therefore the assumption is that for the mixed funds the weight is nearly the same as it is for other fund investments. Nevertheless the benchmark should be treated as normal time. So 50:50 weight between bonds and equities is correct for the benchmark, but during that time period the probability is high that stocks were weighted down.

¹⁰ Main value is defined as 90% of the assets value.

¹¹ In times before the ECB was central bank, central banks for each single Euro-zone member countries had the responsibility for broad money. The broad money trend for the Euro-zone was calculated by OECD.
rate in that area is high too, this could be interpreted that it is now easier to lend money. In reverse if the M3 growth rate is going down, the lending growth rate drops too (cp. Grabau and Joebges 2013). For M3 as index, data from the OECD was used. With this data the growth rate can be calculated: $\delta_{M3,t}$ which is a variable for M3 growth in year t.

The fundamental part for the growth rate of the NAV is the growth rate of the markets at time t, named $\delta_{Markets,t}$. At this point it's important to know the type of fund. To get a comparable benchmark the three categories have to be treated different. If $D_{S,x}$ is equal to one, as benchmark the growth rates of the MSCI World Index will be used. This index covers sixteen developed countries and shows the overall equity market growth.

Normal distribution is an assumption for all benchmarks. There are funds which had better or worse growth rates than the benchmarks, but in the average the growth rate of the MSCI World Index should be met. In the case that $D_{B,x}$ is one, as benchmark the REXX gov Bond was chosen. This is a virtual index for 10yr German government bonds. In reality there are both, short and long term government or corporate bonds existing for all developed countries. In the mean the bond prices and yields for 10yr government bonds should be met. In addition 10yr government bonds are the most important positions a portfolio can have.

If $D_{M,x}$ is equal to one, the growth rates of the benchmark will be determined as its own virtually created index. For these funds the assumption is that fifty percent of the growth rate is received from REXX gov Bond, the other fifty percent from the MSCI World Index. For the mean it is irrelevant whether one fund has more stocks, another fund more bonds weighted in his portfolio.

In order to consider both crises creating a dummy variable could be useful to see the impact of a shock. Dummy variable $D_{Crisis,t}$ was built for this purpose, the value is equal to one if the observed year is either 2008 or 2011.

Finally a variable was created for an interaction term, identified as $\Psi$. With this interaction the reinforced effect between a crisis, M3 growth and the overall market benchmark can be shown. For overall market benchmark a new virtual index should be

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14 There are many bonds which have better yields than German government bonds (for example US-government bonds or Japanese ones). With 2008 the German yields started to spread against other European government bonds and the yields drops dramatically due to the situation that Germany was seen as a country where defaults has a lower probability than for example Greece (especially with 2011). Before that time, yields were nearly the same for European countries. Institutional investors are not only focus on Europe, so due to normal distribution assumptions the German bond prices and yields should be treated as the mean.
used. For this index the weights from the used sample was taken (except the mixed funds), weighted 80% of REXX gov Bond for the bond funds and 20% MSCI World Index for the equity funds. If there is a crisis a mixed fund would overweight government bonds to reduce the risk, once the shock is over, the portfolio may revert back to the weights of original security types.

IV Empirical Strategy

After defining the variables from section III, some models can be introduced to show the growth rate of NAVs of institutional funds using these variables.

In Model (1) there is shown the average growth rate of a NAV for all funds in dependence of the average growth rate for relevant markets. Here the assumption is that only the market movements are effecting the NAV growth. For the collected data the model may be:

$$\delta_{NAV,x,t} = \beta_0 + \beta_1 \delta_{Markets,t} + \varepsilon$$  \hspace{1cm} (1)

The error term is represented by $\varepsilon$. Due to the fact that the balanced panel data is collected during a time when two crises occurred, $D_{Crisis,t}$ should be included to get a more accurate result. In Model (2) this effect is accounted for:

$$\delta_{NAV,x,t} = \beta_0 + \beta_1 \delta_{Markets,t} + \beta_2 D_{Crisis,t} + \varepsilon$$  \hspace{1cm} (2)

$D_{Crisis,t}$ should have a negative impact. A year of crisis especially for equity markets leads to a selloff stocks and correlated for bonds when expectations over retirements shrank.

At every single point in time investors have the possibility to transfer cash to or from their funds. They are able to raise the NAV of a fund with a cash inflow or to reduce the NAV by a cash outflow. If these payments are high the growth rate of a NAV could be very strongly affected. The dummy variables for cash inflow and outflows should be included in the model$^{15}$:

$$\delta_{NAV,x,t} = \beta_0 + \beta_1 \delta_{Markets,t} + \beta_2 D_{Crisis,t} + \beta_3 D_{CI,x,t} + \beta_4 D_{CO,x,t} + \varepsilon$$  \hspace{1cm} (3)

$^{15}$ Unfortunately the data does not deliver information about the exact ratio between cash in- or outflow in comparison to the NAV on that day. The data includes the absolute netted cash in- or outflows. It would be extremely inaccurate if a ratio would be created between year-end NAV and cash transfers. That’s why a Dummy-variable should be better.
A cash outflow has a negative effect on the NAV, so the coefficient of the dummy variable should be negative and subtracted from the model. To describe the effect between average NAV and broad money, shown and explained in section II, the model should also include the broad money growth rate.

\[ \delta_{NAV,x,t} = \beta_0 + \beta_1 \delta_{Markets,t} + \beta_2 D_{Crises,t} + \beta_3 D_{CL,x,t} + \beta_4 D_{CO,x,t} + \beta_5 \delta_{M3,t} + \varepsilon \]  
(4)

As an assumption the interaction term \( \Psi \) may play a big role and could simultaneously boost the effect of declining markets, a crisis and expansion of the broad money M3. In the final model this interaction is included and should deliver a more accurate model as it was implemented in Model (4):

\[ \delta_{NAV,x,t} = \beta_0 + \beta_1 \delta_{Markets,t} + \beta_2 D_{Crises,t} + \beta_3 D_{CL,x,t} + \beta_4 D_{CO,x,t} + \beta_5 \delta_{M3,t} + \beta_6 \Psi + \varepsilon \]  
(5)

After preparing the data, Model (1) to (5) were regressed and tested with the collected panel data set. The results can be seen in the following section.

V Results

For the results of the regressions a random effects model with robust standard errors was used. The advantage is, if some omitted variables may be constant over time but vary between cases or may be fixed between cases but vary over time, a random effects model is more efficient than a fixed effects model. To check the validity for a random effects model a Hausman test was done. The Hausman test shows that differences in coefficients were not systematic.\(^{16}\)

The regression output can be seen in Table 3. With one exception in column four for market growth, all other results of the coefficients were significant (at least of the ten percentage level) for each of the five models.

In Model (1) the impact of the market growth rate of the dependent variable NAV growth rate was tested (column one in Table 3). If the overall benchmark for the funds is going up by one percentage point, the NAV growth rate rises by 0.394 percentage points ceteris paribus, significant of the one percentage level. If for example the growth rate of

\(^{16}\)This means that the random effects estimator is consistent and efficient. \( Prob>\chi^2 \) was 0.0512. To be on the safe side for using a random effects model, \( Prob>\chi^2 \) should be larger than 0.05; A fixed effects model would be still consistent but inefficient; cp. Baum (2006) and http://dss.princeton.edu/online_help/stats_packages/stata/panel.htm (call date 30th August 2013)
the overall market is five percent the NAV grows by approximately 4.6% in that model for the sample (due to the constant).

As discussed earlier as there is an omitted variable bias, another variable has to be included to make the model more efficient. As the time period in scope from the panel data has the two shocks, as a matter of course both shocks should be included. This was done in Model (2), regression results were shown in column two of Table 3. The effect of the growth rate for the market is a little bit smaller, but nearly the same (as it is for the other tests too). If there was a crisis, named from the market in “New Normal” times, the growth rate for the NAV drops by 16.1 percentage points. If the coefficients were compared between column one and column two, it is easy to see that a crisis has a huge impact on the NAV. For example the MSCI World Index dropped by 42% in 2008. Based on this example it means that the NAV growth rate for all funds in average would be decline by 16.4%, provided that the bond markets are remained the same.\textsuperscript{17} For the following three models the effect of a crisis stays nearly the identical (except in Model (5) due to the interaction term).

In Model (3) a very relevant reason for NAV changes is considered. An institutional investor can actively change the NAV with cash inflows or outflows. In a scenario where a company has invested a large sum of money in a fund but needs cash at a point of time when the gross domestic product drops, the company is able to withdraw cash from their investments. This is an example for a cash outflow. In contrast a firm may deposit a large sum of money annually to a pension fund for the staff or execution board. This example is a reason for a cash inflow. For the sample it means that in average approximately thirteen percent of the NAV-amount is a cash inflow, in contrast to nine percent of NAV-amount would be a cash outflow ceteris paribus (column three in Table 3).

In column four broad money M3 is considered and implemented for Model (4). In comparison to Model (3) nearly all coefficients for explanatory variables are the same. But nevertheless M3 is playing a role. If M3 growth rate is raising by one percentage point the growth rate of the NAV is rising by 0.256 percentage points. This means that for example in year 2007 when the M3 growth rate was more than ten percent the NAV growth rate was rising by approximately three percentage points ceteris paribus. This would mean that the boosted wealth is man-made by ECB’s expansive monetary policy.

In comparison to this model, Model (5) includes the interaction term. The

\textsuperscript{17} For the calculation it’s important to know that Market_Gr would be: -42%*0,2 (the share of stocks in the panel) + 0%*0,8 (the share of bonds in the panel) = -8.4%
assumption is that if in a crisis, broad money growth change and the market growth are acting together, the effects could have an impact on the NAV growth. The results are shown in column five. In regards to Model (2) to (4) the crisis coefficient is lower than in Model (5). It seems verisimilar that the crisis effect is additionally included in the interaction term. But the interpretation of some coefficients or the interaction term is not easy. If there is a crisis, the marginal effect for broad money growth rate depends on markets growth rate. In reverse the marginal effect for markets growth rate depends on M3 growth rate also. The sign of the interaction coefficient shows a correction of the other coefficients. If there is no crisis the coefficients and the results for NAV growth assumptions are nearly the same. The difference between the results in cases of a crisis for Model (4) and (5) should be shown in following example. The results of this example are summarized in Table 4.

Assumption for the calculation is a crisis year. The markets are going up for bonds by nine percent (this could happen if the yields for bonds are declining rapidly while the bond prices boost due to direct relation between yields and bond prices) and down by twenty percent for equities. Broad money growth is rising by five percentage points. In addition there is neither a cash inflow nor a cash outflow. This example should be treated as first scenario A. In Model (4) the NAV growth would be -8.70% in comparison to Model (5) with -7.75% of NAV growth.\textsuperscript{18}

For a second scenario B the assumption is that the broad money growth rate would expend by additional five percentage points (to get a growth rate at it was for example in 2008). In that scenario, the NAV growth rate of Model (4) would be equal to -7.42%. In Model (5) the scenario of ten percent broad money growth rate results in a NAV growth rate equal to -10.25%. In comparison to the first scenario with only five percent M3 growth, the NAV growth rate for Model (4) became higher, for Model (5) it became lower.

This may be treated as evidence for an interaction effect, which boosts the drop of the NAV growth if the broad money expends. A possible reason for this result is the leverage by itself. Leverage and investing money based on credits or borrowed amounts leads to higher risk. If now the markets decline, the NAV growth drops more rapidly than without leverage. A simple example should show the effect. A fund has invested the complete assets of 100 EUR in a market, which declines by twenty percent. Granted that

\textsuperscript{18} Market Gr: 0.2*-20 + 0.8*9 = 3.2
Calculation for Model (4): 5.76 + 0.395*3.2 – 17.0 + 0.256 * 5 = -8.69
Calculation for Model (5): 4.91 + 0.391*3.2 – 11.4 + 0.468 * 5 - 0.303 * 5 * 3.2 *1 = -7.75
only the market is effecting the NAV growth the NAV declines by twenty percent also. The NAV of this fund would be now 80 EUR. Now assumed, if a fund with assets of 100 EUR could have an interest less credit of fifty percent of the NAV, the fund would invest this amount also in the same market. The assets of the funds are 150 EUR, the liabilities are 50 EUR, and the NAV would be 100 EUR again. But if now the market is going down by twenty percent the NAV declines to 70 EUR and the NAV growth would be -30%. In comparison to the first example with -20%, due to high risk, the fund is losing more money.

However, the effect of the interaction term works only with extreme assumptions at it was during the “New Normal” time. A scenario with low growth in bond prices and low broad money growth, and a second scenario with lower M3 growth than in the first one, the interaction term works too. Playing around with other assumptions lead to interpretation or problems of logic where Model (4) should win. So it appears that Model (4) is plausible, regardless of extreme or normal calculations. For getting more efficient results Model (5) should be used if there are extreme assumptions, or assumption of low bond prices and low or decreasing broad money growth rate (more critic in section VI).

VI Critic

In this section the main focus is on some critical points or variables which would lead to a more specific model, as it was described in sections III to V. First the benchmark was split in three possible categories, named as stocks, bonds or mixed funds. This was done by viewing the top 100 positions of a fund. For potentially additional work on such a theme, these positions could be viewed from another background. It is possible that an equity fund is invested only in some regions or branches. The investment may be chosen by the market capitalization of a corporation (for example small companies, which promise big chances on new markets, or big corporations, which are known by everybody). For stocks the MSCI World Index was chosen, which is the most important benchmark for worldwide invested equity funds. If a fund is only invested in one region, for example Germany, other benchmarks, like the DAX 30 would be more suitable. The same benchmark issue exists for bonds or mixed funds as well. For every observed fund a

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19 DAX 30 included thirty of the most traded and biggest companies in Germany, listed at the Frankfurt stock exchange or Xetra cp. http://www.dax-indices.com/DE/MediaLibrary/Document/Equity_L_6_17_d.pdf (call date 1st Sep 2013); Xetra is an electronic trading platform provided by Deutsche Boerse, which substitute the trading floor.
benchmark could be found matching the fund characteristics more accurately. Overall the common benchmarks were good indicators how a fund is performing.

A second issue is omitted variables, due to missing or confidential data. Every fund has costs for fees or commissions. For example transaction costs have to be paid to a broker. The custodian bank is receiving a custodian fee. The management of a fund has to be paid too, due to a management fee. Such fees are often paid as a percentage of the NAV or linked to the fund’s performance. Every client has additional agreed expenses which differ from client to client. Discounts of brokerage fees for many trades or custodian fees are common. The cost overview could be tried to implement to the regression models. For this paper an easy assumption will be made, that all funds are affected in the identical way over all years for the same percentage of the NAV. So all observations have the same issue. In the NAV growth regression the commissions could be ignored. The percentage of the NAV which is affected should have a dimension of 0.2 percentage of the NAV per annum. To get a more realistic regression or model, data for these fee-issues have to be found.

The leverage measure, which is shown in the regression models with M3 growth, could be tried to get more specified. For this, the liabilities against banks should be collected for all funds, after then a leverage ratio could be calculated and used as direct channel of M3. The leverage ratio could be run as single regression of M3 with other variables to find an instrumental variable. Without that data, the only assumption of the direct channel of M3 should be enough. The direct correlation between M3 growth rate and lending growth rate was discussed in section II.

These three critical points vary over time. For an active managed fund the top 100 positions change over time too, so it is not enough to view the positions at one point of time. To be absolutely sure, at least twice per year and per fund the holdings should be checked. Especially for institutional funds the investor can easily change his or her mind concerning strategies (no external consent needed). In theory the benchmark is MSCI World Index in one year and the DAX 30 in another year. Two years later the investor could decide to change the fund type from equities to bonds. De facto such changes are extremely seldom and have a low probability. There is no easy way to find such amendments, especially with viewing the trend of the NAVs of the observed funds. If such an unclear change could be seen in the data set – the fund observations were deleted. With checks of such a high data volume (approximately a half million positions), maybe some funds could be re-included for the panel data set.

Another critical point is the life cycle of an institutional fund. Some investors have
multiple funds. It depends on the strategy an investor has. For example it is possible that an investor has 30 funds. Cost reason could lead to merge some funds into a new or an existing one. It also may be that an investor is changing the custodian bank, moving from or to the observed custodian. All these examples are reasons why the panel has to be reduced for getting a balanced one. In addition it is possible that an investor, who owns more than one fund, is doing cash outflows to another fund. It may be that this receiving fund is served by another custodian bank. It is also possible that the receiving fund is a new one, which is not included in the balanced panel. The coefficients from Table 3 are correct for the sample, but drawing conclusions about generally states concerning cash movements should be done carefully. Under the assumption that no cash inflows or outflows were done, generalisations for the institutional funds can be done.

VII Conclusions

This paper researched the NAV growth rate of institutional funds between 2007 and 2012. With empirical data, the paper presented a model how the NAV growth rates change in dependence of other variables, thereby the focus was on the broad money growth. In this paper for the sample was shown that the NAV growth is higher, when the broad money growth rate is rising. Through three channels (two indirect ones, with market growth and cash in- and outflows, and one direct channel, over the M3 growth and leverage possibility) broad money has a very strong effect to the NAV growth rate. If M3 grew by four percentage points the NAV growth rate will rise by one percentage points ceteris paribus. In the case that the interaction term assumptions is valid, which means in “New Normal” times during a crises are strong market movements, the NAV growth would drop, depending on the broad money change, as it was shown in an example in section V. This result was not surprising. The leverage and with it the high risk leads to declining NAV growth rate. Overall M3 can have a positive effect on the NAV, or a negative boost one, in cases that the interaction term assumptions are working. So the nominal wealth growth of institutional investors is affected in both cases.

For this paper the empirical work for the observed sample had priority. Other consequences which happen with increasing broad money growth rate, like inflation (which impacts the real wealth growth of institutional investors) or worsening the average
rating of a credit due to easiness of receiving cash by banks, were not discussed in this paper. With low interest rates and growing broad money, a situation is present where risk could be overlooked with the advantages leverage has. If the markets decline, pensions for staff could endangered. Especially such pension funds and the relevant fund management should avoid additional risks. At time of crises shocks in the markets lead to adequate risk which shouldn’t be expand by broad money growth. In other cases the risk from the market will be multiplied by the risk due to leverage.

The model in this paper included specific financial characteristics. Elementary for the financial sector is a benchmark. Adding the two crises in the models, the paper showed the very strong effect a shock has for the NAV growth rate, and especially the wealth growth in Germany for institutional investors.

Based on these results comparisons to mutual funds could be drawn with further researches. There, M3 should not have such a strong impact, because there are limitations for leverage by law or conditions. The other effects and coefficients should be nearly similar. In addition with the thesis that M3 has a very strong effect to NAV growth rate, new investigations could be started. So it could be researched whether there is a bubble, which may pop once the ECB should decide to reduce the broad money.

The limitations of the model in this paper were discussed in section VI. The made assumptions in this paper are valid, but could be more specified in detail. Further research should try to include these critical points.
References


Pohl, Hans (1992), „Deutsche Börsengeschichte“, Frankfurt am Main, Knapp Verlag


Reinhart, Carmen M. and Kenneth S. Rogoff (2011), „This Time Is Different“, Eight Centuries of Financial Folly, Princeton University Press, USA
Appendix

Figure 1

Historical Trend for the cumulated NAV

Source: Deutsche Bundesbank & Bundesverband Investment und Asset Management e.V.

Figure 2

Historical Trend for the average NAV

Source: Deutsche Bundesbank & Bundesverband Investment und Asset Management e.V.
Figure 3

M3 vs Historical average NAV

Source: OECD & Bundesverband Investment und Asset Management e.V.

Figure 4

M3 Index

Source: OECD
Table 1

<table>
<thead>
<tr>
<th>Fund Type</th>
<th>No. of observations</th>
<th>Overall NAV in mio EUR</th>
<th>NAV in % of observations</th>
<th>No. Cash inflow</th>
<th>No. Cash outflow</th>
<th>Benchmark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equity</td>
<td>30</td>
<td>4,966</td>
<td>10.07</td>
<td>57</td>
<td>34</td>
<td>MSCI World Index</td>
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<tr>
<td>Mixed</td>
<td>30</td>
<td>25,694</td>
<td>52.11</td>
<td>14</td>
<td>10</td>
<td>50:50 MSCI/REXX</td>
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<tr>
<td>Bond</td>
<td>55</td>
<td>18,646</td>
<td>37.82</td>
<td>87</td>
<td>63</td>
<td>REXX Gov Bond</td>
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<tr>
<td>Total</td>
<td>115</td>
<td>49,306</td>
<td>100.00</td>
<td>158</td>
<td>107</td>
<td>20:80 MSCI/REXX</td>
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</table>
### Table 3

<table>
<thead>
<tr>
<th>Scenario</th>
<th>(1) NAV_GR</th>
<th>(2) NAV_GR</th>
<th>(3) NAV_GR</th>
<th>(4) NAV_GR</th>
<th>(5) NAV_GR</th>
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<tbody>
<tr>
<td>Market_GR</td>
<td>0.39446**</td>
<td>0.35991**</td>
<td>0.36498**</td>
<td>0.39520**</td>
<td>0.39075**</td>
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<tr>
<td></td>
<td>(0.150)</td>
<td>(0.139)</td>
<td>(0.138)</td>
<td>(0.150)</td>
<td>(0.149)</td>
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<tr>
<td>Crises</td>
<td>-16.113***</td>
<td>-16.667***</td>
<td>-17.007***</td>
<td>-11.414***</td>
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<tr>
<td></td>
<td>(2.508)</td>
<td>(2.476)</td>
<td>(2.514)</td>
<td>(3.383)</td>
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<tr>
<td>Cash_in</td>
<td>12.989***</td>
<td>12.871***</td>
<td>12.582***</td>
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<td></td>
<td>(3.098)</td>
<td>(3.073)</td>
<td>(3.116)</td>
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</tr>
<tr>
<td>Cash_out</td>
<td>-8.992*</td>
<td>-8.726*</td>
<td>-8.4278*</td>
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<tr>
<td></td>
<td>(3.949)</td>
<td>(3.898)</td>
<td>(3.907)</td>
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<td>M3_GR</td>
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<td>0.25567</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.228)</td>
<td>(0.266)</td>
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<tr>
<td>Interaction</td>
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<td>-0.30325</td>
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<td></td>
<td></td>
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<td></td>
<td>(0.179)</td>
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<tr>
<td>_cons</td>
<td>2.5514*</td>
<td>8.0994***</td>
<td>6.9997***</td>
<td>5.7561***</td>
<td>4.9144***</td>
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<tr>
<td></td>
<td>(1.216)</td>
<td>(1.564)</td>
<td>(1.322)</td>
<td>(1.682)</td>
<td>(1.614)</td>
</tr>
<tr>
<td>N</td>
<td>690</td>
<td>690</td>
<td>690</td>
<td>690</td>
<td>690</td>
</tr>
</tbody>
</table>

All regressions are random effects models; robust standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

### Table 4

<table>
<thead>
<tr>
<th>Scenario</th>
<th>NAV growth rate Model (4)</th>
<th>NAV growth rate Model (5)</th>
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</thead>
<tbody>
<tr>
<td>A (5% M3 growth rate)</td>
<td>-8.70%</td>
<td>-7.75%</td>
</tr>
<tr>
<td>B (10% M3 growth rate)</td>
<td>-7.42%</td>
<td>-10.25%</td>
</tr>
<tr>
<td>Changes of NAV in cases that M3 growth rate boost ceteris paribus</td>
<td>NAV rises</td>
<td>NAV drops</td>
</tr>
</tbody>
</table>