Capitalizing on Partisan Politics: Expected Government Partisanship and Sector-Specific Redistribution in Germany 1991-2005

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Abstract

This paper offers the first analysis of sector-specific partisan effects and uncertainty about the electoral outcome on industrial sectors in Germany. Applying a rational partisan perspective, we expect that once in office, ideologically different parties deliver favorable policies to different industries, in order to benefit their sector-specific supporters. Using daily stock returns we empirically evaluate whether and how the mean and the volatility of returns of four important economic sectors co-varied with the electoral prospects of a right-/left-leaning coalition and electoral uncertainty from 1991 to 2005. Based on the assumption of stock markets being semi-strong form efficient, this sheds light on the magnitude of sector-specific redistribution to be expected from ideologically different party coalitions holding office. Our estimates from GARCH/TARCH(1,1) models show that the aerospace-defense, alternative energy, and to some extent also the pharmaceutical and consumer sectors are influenced by expected government partisanship and uncertainty about the electoral outcome.

Keywords: *Government partisanship, stock market performance, industrial sectors, German federal elections, GARCH modeling, redistribution*

JEL-Classification: P16, O16, G38

1. Introduction

Political scientists increasingly consider stock market responses to politics as a viable approach to study the existence and magnitude of the effects of government partisanship on the economy (Leblang and Mukherjee 2005, 2004; Jensen/Schmith 2005; Genmill 1992). While most of these studies look into the effects of partisan politics on the overall development of the economy as represented by broad stock market indices, less effort has been devoted to the question whether wealth transfers from one economic sector to another are masked by analyzing aggregate market developments (Knight 2006; Herron et al. 1999; Roberts 1990). Up to now, none of the existing empirical studies has examined the influence of expected government partisanship and electoral uncertainty on both, the mean and the volatility of sector returns. The intention of this paper is to fill this gap, answering the question whether parties and elections matter for the performance of important industrial sectors in one of the world's major economies.

Drawing on the partisan model of government (Hibbs 1977; Alesina et al. 1997) we expect that once in office, parties implement economic policies designed to systematically discriminate between industries, i.e. different parties deliver favorable policies to different economic sectors. We empirically evaluate this conjecture by investigating whether daily stock returns of four important industrial sectors systematically react to the prospects of ideologically different party coalitions winning the upcoming German federal election and if return volatility is sensitive to electoral uncertainty. Our estimates from GARCH/TARCH(1,1) models show that the aerospace-defense, alternative energy, and to some extent also the pharmaceutical and consumer industries are indeed influenced by electoral uncertainty and the probability of a right/left-leaning coalition winning the next election.

The structure of the paper is as follows: The next section reviews the literature on sector-specific stock market reactions to government partisanship. In section 3 we lay out the theoretical argument and its key assumptions, and subsequently derive empirically observable implications. Section 4 introduces the data and the GARCH technique used for the empirical evaluation. Section 5 presents the results and section 6 concludes.

2. Government Partisanship, Elections and Sector-Specific Redistribution

The impact of partisan politics on the economy has constantly been of interest to scholars of political economy. Since the classical work by Douglas C. Hibbs (1977), one pertinent research question has been whether fluctuations of macroeconomic key variables such as inflation, unemployment and growth can be explained by government partisanship (Alesina 1987, Cohen 1993, Alesina et al. 1997). One strand of this literature has begun to empirically estimate how strong different parties redistribute wealth by looking at the reaction of stock returns to politics (Knight 2006; McGillivray 2004, 2003). The basic idea behind this endeavor is that if rational investors are interested in maximizing their wealth, the effect of political developments and decisions will be incorporated in today's stock prices (Fama 1970). On the aggregate level, price changes will reflect the expected impact of policies on the asset under consideration, by that indicating the direction and the strength of wealth transfers as a consequence of politics. Therefore, stock returns can be used to attain empirical estimates of the monetary impact of different policies (Bernhard and Leblang 2006).

The origin of research on the effects of politics on stock returns dates back to Stigler and Friedland (1962) and Niederhoffer et al. (1970). Since then, the responsiveness of stock returns to politics has experienced a steady increase in scholarly attention, as it provides a field for testing well established models of political economy (Hibbs 1977; Alesina et al. 1997). It may be of even greater interest to financial investors who aim at maximizing their capital gains from stocks. The vast majority of these studies tries to analyze the determinants of overall stock market performance with a focus on the U.S. (Leblang and Mukherjee 2005; Herron 2000; Foerster and Schmitz 1997; Gärtner and Wellershoff 1995; Huang 1985).[1] However, focusing on the overall performance of stock markets is subject to the criticism that political sensitivity might vary across industries, and these effects are aggregated away by considering broad market indices only. For example, in her comparative study of redistributive politics in Western democracies, Fiona McGillivray points out the specific importance of changes in government partisanship for the steel sector in Germany: "A right-wing coalition entered government in 1982 and, despite its market-orientated ideology, began pumping taxpayers' money into steel plants in the Saarland and the Ruhr" (2004: 106). This

[1] Studies for other countries are comparatively rare (see e.g. Siokis and Kapopoulos 2007; Jensen and Schmith 2005; Leblang and Mukherjee 2005; Vuchelen 2003; Herron 2000; Brander 1991).

had very positive consequences for the profitability of the steel sector, which before had suffered from huge reductions in turnover.

Up to now, studies on sector-specific effects of expected government partisanship have been restricted to the U.S. majoritarian political system focusing on single presidential elecions. Because of their small number we review this work in slightly more detail. For the 1980 U.S. presidential election Roberts (1990) regresses daily defense industry security returns on the probability of Ronald Reagan winning the election and the probability of a Republican majority in Congress. He argues that since Ronald Reagan chose defense policy as a major issue for his presidential campaign in 1980 his electoral probability should be positively related to defense industry securities. Indeed, the evidence suggests that shares of the defense sector portfolio gained 1.4 percentages on average as the probability of a Reagan victory and a Republican Congress majority increased by one percent (Roberts 1990: 303). Overall stock market performance however was not significantly affected by the expected partisanship of the presidency. Again, this hints towards heterogeneity in political responsiveness across economic sectors, which is aggregated away if broad stock market indices are examined (Roberts 1990: 304).

Herron et al. (1999) examine sector-specific partisan effects in the 1992 presidential election. They model the U.S. economy as consisting of 74 economic sectors each represented by the appropriate Dow Jones Industry Group portfolio. Since the policies of different candidates (George Bush, Bill Clinton, Ross Perot) were expected to have different consequences for sector profits, the corresponding sector index prices should reflect these future effects on profitability. The estimations show that 15 out of 74 sectors were significantly influenced by changes in the electoral prospects of the presidential candidates. While the pollution control sector gained value as the probability of Bill Clinton getting elected increased, the cosmetics and personal-care sector, as well as the pharmaceutical sector suffered from the higher electoral prospects of the democratic candidate. For the 2000 presidential election Knight (2006) uses buy recommendations of several investment banks to create a “Bush portfolio” consisting of firms which were supposed to benefit from the economic policy of the republican candidate George W. Bush. Analogously, companies which were expected to perform better under the presidency of Al Gore constituted the “Al Gore portfolio”. The empirical results show that the returns of the respective portfolios were significantly related to the electoral probabilities of the candidates.

Mattozzi (2004) creates two different portfolios, one for each candidate in the 2000 presidential election, and each comprising those 10 firms with the highest campaign contributions to that candidate. The firm most generous to George W. Bush came from the tobacco sector: Philip Morris contributed 3.8 million dollars. Other major donations were made by pharmaceutics companies.[2] In contrast, Al Gore mainly received campaign contributions from the entertainment and film industry. The empirical estimates show, that stock market performance of firms which contributed to a certain candidate was significantly influenced by the electoral prospects of this candidate winning the election. In a similar fashion Cheng (2005) sets up a "Bush" and a "Kerry portfolio" for the 2004 presidential election consisting of those companies which made high campaign donations to the corresponding candidate. The results show that an increase of the electoral victory of George W. Bush was associated with an increase in the value of "his" portfolio on the following day while the "Kerry" portfolio lost market value.

As this literature review demonstrates, our interest in sector-specific partisan effects on the stock market is not novel. However, up to now none of the existing empirical studies has examined the influence of expected government partisanship and electoral uncertainty on both, the mean and the volatility of sector returns. Secondly, since the evidence so far is based on the analysis of single elections, it is not clear whether we can conclude that government partisanship and the performance of economic sectors are generally related. Thirdly, past work has exclusively focused on sector-specific reactions to expected government partisanship in the U.S., while no study has looked into the relevance of parties and elections for sector returns in a consensus democracy.[3] This is important as Westminster systems, because of their strong majoritarian elements and the absence of veto players, are much more prone to strong policy shifts due to changes in government partisanship (Lijphart 1999; Tsebelis 1990). Against this background it would be all the more interesting to see whether parties matter for economic sectors in a consensus democracy like Germany, where the potential for strong policy shifts may be regarded to be lower. Up to now, we do not know whether parties matter for industrial sectors in such an institutional environment.

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[2] These were Pfizer, Bristol-Myers Squibb and GlaxoSmithKline each contributing between 1.8 (GlaxoSmithKline) und 2.5 (Pfizer) million dollars. Furthermore, the energy firm Enron supported George W. Bush's campaign (2.5 million dollars).

[3] McGillivray (2003, 2004) uses cross-sectional data including both, Westminster and consensus systems, but does not estimate the impact of expected government partisanship on the mean and the volatility of sector returns.

3. Parties' Policies, Electoral Uncertainty, and Industrial Sectors

Partisan models of government (Hibbs 1977, 1987; Alesina et al. 1997, Alesina 1987) argue that parties try to implement their ideologically determined ideal policies. A corollary is that, once in government, parties will enact economic policies which benefit some parts of the electorate at the expense of others. Taking this line of reasoning one step further, parties should pursue economic policies designed to systematically discriminate between industries in a way which is consistent with the preferences of their supporters. This argument is also in accordance with ideology induced campaign contribution models which assume business interests to support those parties whose policies are closest to their own ideal points (Austen-Smith 1995; Hall and Deardorff 2006), i.e. "donors support candidates who value the same things that they do" (Brownars and Lott 1997), in order to increase the prospects of this party getting elected.[4] Therefore, contributions from business interests should not only be a good predictor for e.g. member participation in legislative committees (Hall and Wayman 1990), but could be interpreted as a signal indicating under which party an industry expects to fare better.

It is important to note that sector-specific partisan effects hinge on policies being specific, too. This is to say that parties need to offer distinct platforms, and the policies available need to be focused narrowly enough so that industries can be targeted strategically. In fact, heterogeneity of parties' policies seems more plausible in multi-party systems, where the equilibrium prediction of the Downsian model does not hold, i.e. since there is no Condorcet winning position, parties' policies should not converge to the median (or mean in the multidimensional case) voter. Also, to the extent party competition is multi-dimensional, parties' economic policies not only differ with regard to their preferred unemployment and inflation levels (Debus 2006; Pappi and Shikanu 2004; Budge et al. 2001, 1994), but rather there are strong incentives for parties to maintain distinct multi-dimensional economic policies benefiting their supporters once in government (Persson and Tabellini 2000).

Obviously, we need to act with caution, before empirically estimating partisan effects on industrial sectors across time. Since this requires pooling across elections, not only we need parties' policies to differ on multiple economically relevant issues dimensions, but also these differences have to remain relatively stable, or using a more Downsian terminology, the party

[4] See also Gordon and Hafer 2005; Hojnacki and Kimball 1999, 1998; Grenzke 1989.

differential must not switch its sign. In turn, we explain the relevance of these conditions and demonstrate why we are confident that they indeed hold.

Heterogeneity and Stability of Parties' Ideal Policies

In order to examine the sector-specific consequences of government partisanship from 1991 to 2005, we need to substantiate that (1) there is indeed heterogeneity in parties' ideal points and (2) differences in these ideal points remain (relatively) stable across time. These conditions need to be met for the following reasons. Without heterogeneity in parties' preferred policies, differences in effects of government partisanship are unreasonable. In fact, it would not make sense to talk about left and right anymore, if all parties had the same ideal point. Furthermore, relative stability of right and left parties' ideal points is required, i.e. parties have to keep themselves generally apart inside their own ideological spectrum. This assumption would be violated if left parties leap-frogged right parties (or vice versa) across time.[5] In such a case pooling across elections would not be justified, since this would amount to estimating one coefficient which masked that the effect of government partisanship possibly switches its sign across time.

With regard to the first requirement it is important to note that in Germany strong differences in parties' ideal policies can be observed empirically, regardless of whether ideal point estimates are based on party manifestoes (Debus 2006; Pappi and Shikano 2004; Budge et al. 2001, 1994) or expert interviews (Benoit and Laver 2006). Figure 1 shows the policy positions of the four major German parties, the Social Democratic Party (SPD), the Greens, the Christian Democratic Union (CDU) and the Liberals (FDP), on the classical left-right dimension ranging from 0 (extreme left) to 20 (extreme right) together with a 95 percent confidence interval. To a large extent the left-right-scale reflects a party's stance on the question whether taxes should be raised in order to increase public services or whether public services should be cut in order to decrease taxes.

- figure 1 about here -

[5] However, since we examine the impact of changing electoral prospects of ideologically homogeneous party coalitions on the performance of economic sectors, our analysis is robust to left (right) parties leap-frogging other left (right) parties.

Left (SPD and Greens) and right parties' (CDU and FDP) policy positions on the economic dimension are clearly distinct from each other in all election years in the 1994-2005 period (Debus 2006). The SPD and the Greens always remain to the left of the CDU and the FDP and also their 95-percent confidence intervals never overlap. Thus, the evidence supports the assumption that policies of right and left parties were distinct from each other and that the difference in ideal points remained (relatively) stable across time.

For 2002, more detailed information on parties' ideal policies on different issue dimensions is available. Based on results from an expert survey, Benoit and Laver (2006) identify several economically relevant policy issues. Figure 2 shows estimates for German parties' policy positions on the three most salient and economically relevant policy dimensions for the SPD, the Greens, the CDU, and the FDP.

- figure 2 about here -

In line with party positions estimated by Debus (2006), SPD and Greens were both close together below 10 on the left-right scale. CDU and FDP were located right from the center. There was also much divergence of ideal points with regard to environmental politics. While the CDU and especially the Liberals opposed the view, that the environment should be protected even if this reduces economic growth, the SPD and the Greens in particular were willing to pay the economic costs of environmental protection. In fact, when the SPD-Green coalition came into office in 1998, it started to subsidize the relatively small alternative energy sector, while at the same time legal restrictions were set on the operating time of existing nuclear power stations, by that changing the relative profitability of this industry. Unsurprisingly, this step was severely criticized by the CDU and the FDP.

In order to identify economic winners and losers of parties' policies we use the information about parties' ideal policies just presented and two additional sources. Following the strategy of Knight (2006) our first source is information on campaign contributions made by firms and industry associations to different parties in election years from 1991 to 2005, i.e. 1994, 1998, 2002, and 2005. We make the assumption that interest groups will support those parties which share similar policies, and therefore making a contribution to a party signals that the party's ideal point is comparably close to that of the interest group (Austen-Smith

1995, Hall and Deardorff 2006).[6] Secondly, we exploit the fact that a major investment bank (Dresdner Kleinwort Wasserstein) published sector-specific buy recommendations conditional on different party coalitions winning the 2002 election. In order to keep things within the scope of a single article, we decided to restrict our analysis to those sectors whose political preference we could clearly identify and which can be considered to be among the most important industries for the German economy.

Causal Mechanism and Hypotheses

Both, the contribution behavior by firms belonging to the aerospace-defense sector and the higher importance of defense and homeland security issues to conservative parties let us presume, that this industry should benefit from a right-leaning government (see also Knight 2006; Roberts 1990). Consequently, if the electoral prospects of a right-leaning coalition increase, returns on a portfolio of aerospace and defense stocks should increase. As the expected value of a stock increases, investors will react by reallocating their investment portfolio. This portfolio rebalancing triggers higher trading volume, which causes not only increases in returns, but also in volatility (Gallant et al. 1992; Glosten and Milgrom 1985).[7] Because rational investors should anticipate the beneficial impact of government partisanship on firms of the *aero-defense industry*, the mean and volatility of the sector returns should increase, if the probability of a right-wing government increases.

As has already become clear in the discussion of parties' ideal policies, left parties like the SPD and the Greens are much more concerned about environmental protection than right-leaning parties. They actively promote the development of alternative energy sources and are willing to heavily subsidize the alternative energy sector. Therefore, we presume that if the probability of a left-wing government increases, the mean and the volatility of *alternative energy sector* returns increase.

The third industry, which – according to the contribution behavior of firms – should be responsive to changes in government partisanship, is the pharmaceutical sector, which financially supported the CDU. Because this can be interpreted as a signal of relative

[6] The empirical evidence supports the hypothesis that "donors support candidates who value the same things that they do" (Brownars and Lott 1997; see also Hojnacki and Kimball 1999, 1998; Grenzke 1989). First empirical evidence suggests that this relationship holds for the German political system as well (Höpner 2006; Sebaldt and Straßner 2004). Information on financial contributions is available from Höpner (2006) and the annual statement of accounts of the German parties published as a document of the German Bundestag.

closeness of ideal policies, we hypothesize that if the probability of a right-leaning government increases, the mean and the volatility of the *pharmaceutical sector* returns increases.

The fourth sector which should be affected by parties' policies is the consumer industry. The report from financial analysts identified this sector as likely to fare especially well under a left-wing government. The reason is that left parties strengthen labor unions' in wage bargaining (Calmfors et al. 1988; OECD 2004) and emphasize the importance of wage increases for fueling demand. Consequently, profits of the consumer sector should benefit from left-wing governments. The empirically observable implication is that if electoral prospects of a left-wing coalition increase, the mean and the volatility of *consumer sector returns* will increase.[8]

Often, outcomes of elections may be predictable to a large extent. In such a case, market actors can make their allocation decisions without having to fear that future economic conditions influenced by the next government may change from one second to another. Clearly, things look very different if an election is close, because it becomes increasingly difficult to predict future government partisanship. Since stock markets reflect higher risk by higher volatility, past studies have hypothesized that an increase in electoral uncertainty is associated with higher stock market volatility. Indeed, the empirical evidence seems to support this conjecture (see e.g. Leblang/Mukherjee 2005 for theory and evidence). However, this argument has been developed with the U.S. political system in mind.

We do not think this hypothesis can be taken out of the U.S. context and applied to more consensual political systems offhand. This is because in consensus democracies, increasing electoral closeness between the major parties means that the upcoming election is less likely to produce an ideologically coherent government, which consists of either more left- or more right-leaning parties (Lijphart 1999). Instead, the more evenly electoral prospects are distributed between the major left- and right-wing parties, the higher the probability of a coalition between ideologically heterogeneous parties. Being forced to form a coalition government, a government's policies result from a bargaining process between

[7] It will be obvious to the attentive reader, that this causal link requires trading volume to be interacted with the electoral probability in the empirical estimation.

[8] However, it could be argued that expectations of higher labor costs associated with left-leaning governments may actually dampen future profits of firms in this industry. In this case, we would not find a significant correlation between sector returns and the probability of a left-wing coalition winning the election.

political actors whose ideal points are to the left and the right of the median.[9] As the outcome will lie in the zone of agreement, which is more moderate than in case of ideologically homogeneous parties, grave policy changes are in fact much less likely to occur than in Westminster systems, which are characterized by single-party governments and consequently, a change in government is associated with major policy shifts (if parties are polarized). But electoral uncertainty does not imply policy uncertainty in consensus democracies. Rather, in such an institutional setting, higher electoral uncertainty might be interpreted as a signal of relative future economic policy stability, which implies less policy risk. Therefore, since we are evaluating partisan effects in a consensus democracy, we expect higher electoral uncertainty to be associated with lower volatility.

4. Research Strategy and Data

If markets are semi-strong form efficient (Fama 1970) all publicly available information that might influence the value of a given company will be incorporated in today's prices. On the aggregate level, price changes will then reflect the expected impact of government policies on future profits, by that indicating the direction and strength of wealth transfers as a consequence of politics (Knight 2006; McGillivray 2004, 2003; Binder 1985). Therefore, stock returns can be used to investigate the impact of parties' policies on the economy (Bernhard/Leblang 2006). Although this research strategy is widely used in financial economics and increasingly in political science, it should be noted that it provides only an indirect measure of partisan effects on industries, which hinges on the stock market being semi-strong form efficient. In view of the strong financial incentives which reward wealth-maximizing behavior on stock markets, and given the substantial evidence supporting the semi-strong version of the efficient market hypothesis, we are confident that this assumption is justified.

[9] Or mean, in the multidimensional case.

Dependent Variable: Sector Returns

Our dependent variable is the continuously compounded sector return. Let P be the quoted price at time t, then the continuously compounded return R_t is defined as

$$R_t \equiv \ln(P_t) - \ln(P_{t-1}) . \tag{1}$$

The consumer and pharmaceutical sector total return indices were taken from Datastream. Since an alternative energy sector index was not available at Datastream, and the aero-defense index offered did not cover the whole 1991-2005 period, we decided to construct these series according to the value index concept.[10] In doing so, let $P_{i,t}$ be the share price of firm i at time t, then the price P of the sector index s at time t is

$$P_{s,t} = \frac{\sum_{i=1}^{n} P_{i,t} \cdot MC_{i,t}}{\sum_{i=1}^{n} P_{i,0} \cdot MC_{i,0}} \cdot 100 \tag{2}$$

where MC_i is the market capitalization of the stock i. In words, the sector index was created by summing up the value-weighted prices across all firms n in a sector at time t divided by the sum of the value-weighted prices across these firms in the base period.[11] The trading volume series was created by summing up the number of shares (in ‘000) traded on a day t in the respective sector s. Daily figures are adjusted for capital changes and represent the consolidated volume across all German exchanges. Figure 3 plots the continuously compounded return of the aero-defense, alternative energy, pharmaceutical and consumer sector. Table 1 provides descriptive statistics. For all sectors data from 1991 to 2005 was available expect for the alternative energy sector, which starts at the end of 1998 due to restrictions on data availability.

- figure 3 about here -

[10] The firms used to create the aero-defense sector index are: EADS, Cargolifter, Renk, IWKA, Daimler Chrysler, Rheinmetall, ThyssenKrupp. For alternative energy Plambeck, SAG Solarstrom, Solarparc, Solarworld, Nordex were included. To represent the pharmaceutical and consumer industry we used the German Consumer and Pharmaceuticals Sector Indices from Thomson Financial Datastream. Also all individual price and trading volumes as well as macroeconomic data were taken from this source.

[11] The base period is September 2nd 1991 for all sectors except for alternative energy, where it is December 14th 1998.

Main Explanatory Variable: Expected Government Partisanship

Since we are interested in whether government partisanship influences the well-being of economic sectors, we need a measure for the probability of a left-/right-wing coalition winning the next election. For that we apply the "electoral option model" (Alesina et al. 1997: 114-116). The probability of a right-wing coalition formed by the CDU/CSU and the Liberals (FDP) receiving a majority in the upcoming election at time *t* relative to a coalition consisting of SPD and Greens is:

$$\Pr_t(Right) = \Phi\left[\frac{\left(\frac{Q_t^{CDU} + Q_t^{FDP}}{\sum_{j \in J} Q_t^j}\right) + \mu m - 50}{\sigma\sqrt{m}}\right] \tag{3}$$

where Φ is the cumulative standard normal distribution, and Q_t^{CDU} and Q_t^{FDP} denote the proportions of citizens who intended to vote for the CDU and the FDP at time *t*. To standardize their vote share we divide the polled proportion of seats by the sum of vote shares received by all main German parties, so $J = \{CDU, SPD, Greens, FDP\}$.[12] μ is the sample mean of daily changes in this standardized proportion, σ is the sample standard deviation in daily changes, and m is the number of days left until the next election. Since the range of this measure is the unit interval, the probability of a left-leaning government can be calculated as $\Pr_t(Left) = 1 - \Pr_t(Right)$. This operationalization accounts for both, the time left until the next election and the variance in polling results. This is necessary, because the extent to which investors care about future election results certainly varies with the time left until the next election. For example, the day after an election no investor is interested in which government will be installed four years later. As the election day approaches however, the answer to this question continuously gains in importance. Electoral probabilities reflect this argument by weighting polling results with the time left until the next election. Therefore, we can make use of the whole time series and do not need to consider election years only.[13]

[12] CSU vote shares are included in CDU vote shares.

[13] Some studies have restricted their sample, some of them covering up to six decades, to include only pre-election days within election years. Since electoral probabilities appropriately adjust for the time left until the next election, we do not see a need to do so. Moreover, cutting out election years of the time series causes

Polling data from Forsa, a renowned polling institute, are used because these are suited best for constructing electoral probabilities. The fact that this data starts in September 1991 determines the starting date of our sample.[14] As can be seen from figure 4 the electoral probabilities exhibit a cyclical pattern: as the election approaches, the probability of an electoral victory increases for one coalition, while it decreases for the other.

- figure 4 about here -

One exception is the 2002 Election, which was extremely close. That is why prior to election day the prospects of ideologically different coalitions winning office are comparably close to the critical value of 0.5. Since theoretically, expected government partisanship causes changes in demand, measured by trading volume, which triggers higher returns, we need to interact the electoral probability measure and trading volume in the empirical estimation.

In order to pick up possible effects of electoral uncertainty on the volatility of returns, we created an uncertainty measure, based on the electoral probabilities (Leblang and Mukherjee 2005). The basic idea is to define a mapping which reflects that uncertainty is lowest if the probability of a victory is either very high or very low, and that as the difference in electoral probabilities is becoming smaller, expectations of government partisanship are increasingly uncertain. This can be achieved by creating the variable *electoral uncertainty* in the following way:

$$e_t(\Pr_t(Right)) = \frac{1-4(\Pr_t^R - 0.5)^2}{\sqrt{m}}. \tag{4}$$

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considerable problems if the equation to be estimated contains lagged variables, as is almost always the case. For example, in a GARCH model, which is widely applied in contemporary studies, today's conditional variance is assumed to be a function of yesterday's variance and past shocks. This means that by estimating a model using daily data which includes election years only, the return variance on the first day of an election year is considered to be influenced by the variance on the last day before the last election. Depending on the electoral cycle, this amounts to a lag shift of at least several hundred days.

[14] The Forsa data is available at the Central Archive for Empirical Social Research, University Cologne (series IDs: ZA3380, ZA3300, ZA2982, ZA3063, ZA2983, ZA2984, ZA2985, ZA3162, ZA3289, ZA3486, ZA3675, ZA3909, ZA4070, ZA4192). For 2005 the series is also available at http://www.wahlrecht.de/umfragen/forsa/2005.htm. Although we are aware of the so called "Politbarometer" data, which starts in 1977, we cannot increase our number of observations, since this series is only available on a monthly basis, and therefore inappropriate for constructing daily probabilities.

Considering the numerator of this equation first, this defines an inverse U-shaped function which reaches its maximum 1 if the election outcome is very uncertain, i.e. $\Pr_t^R = \Pr_t^L = 0.5$, and equals its minimum value 0, if either the probability of a right-wing government or that of a left wing-government is 0 or 1. Since investors do not care much about whether the difference in electoral probabilities is large or small if an election took place recently, the denominator hyperbolically downweights the raw electoral uncertainty measure as a function of the days m left until the next election. This produces a variable which reflects the degree of electoral uncertainty.

Political and Economic Control Variables

To account for possibly confounding effects several political and economic variables were included in all estimations (see table 1 for descriptive statistics). Since the German stock market is strongly influenced by developments at the New York Stock Exchange, the lagged continuously compounded *Dow Jones Returns* enters all estimations. *Inflation* measures monthly inflation rates. The reason why inflation has to be controlled for is that investing in stocks should – according to orthodox models in finance – be more attractive relative to investing in real assets (e.g. commodities, real estate) if inflation decreases, while increased inflation makes such investments in real assets more profitable as it provides an inflation hedge. Also the *interest rate* as measured by the daily mean Frankfurt money market interest rate helps us to control for fluctuations in the relative profitability of stock investments.[15] *Monday* is a dummy variable which picks up the Monday effect, by that controlling for a well-known market anomaly. We account for the fact that the 2005 election was an early and therefore unusual election by including the dummy variable *Early Election 2005*, which equals 1 for the period starting on the day Chancellor Gerhard Schröder announced his intention to bring about early elections in autumn 2005 and ending on July 1st, when the vote of confidence failed in parliament, as this paved the way for early elections in autumn 2005. *2nd Chamber-CDU (SPD)* measures the number of votes CDU(SPD)-led states have in the second chamber of Germany's federal system and we also include a state election dummy, since they may affect the balance of power at the national level through their effect on the

[15] This variable was taken from the time series data base of the German Central Bank and is available at http://www.bundesbank.de/statistik/statistik_zeitreihen.en.php?func=list&tr=www_s11b_gmt&print=no&.

composition of state governments (Kern and Hainmueller 2006). Moreover, additional indicator variables were included to pick up confounding effects from the crisis of the European monetary system in September 1992 and the terrorist attacks on September 11th 2001.

- table 1 about here -

Estimation Technique

Time series and financial time series in particular are characterized by a number of stylized facts. Most importantly, they often exhibit a time trend as well as a time-varying variance, i.e. periods of high (low) variance are followed by periods of high (low) variance, a phenomenon called conditional heteroscedasticity or volatility clustering. We tested whether ARCH effects are present in our dependent variables. The results from Lagrange multiplier tests confirmed this conjecture. Furthermore, autocorrelation diagnostic tests were computed and also the Ljung-Box $Q^2(5)$ test of squared returns indicates the presence of volatility clustering. These results strongly suggest that a GARCH (generalized autoregressive conditional heteroscedasticity) framework is most suited for the characteristics of our dependent variables (see for example Engle 2001).

A key strength of this technique lies in the possibility to explicitly model the conditional variance of the dependent variable as a function of previous shocks, its own past variance as well as exogenous volatility regressors. By that, ARCH effects are considered as phenomena to be modeled rather than to be corrected for. Recall from equation (1) that the return R at time t is $R_t \equiv \ln(P_t) - \ln(P_{t-1})$, where P_t is the stock price observed at time t. Now let Ψ_{t-1} be the information at time $t-1$, then the conditional mean μ_t is defined as the expected value of R_t conditional on the information set Ψ_{t-1} or

$$\mu_t = E\left[R_t \middle| \Psi_{t-1}\right]. \tag{5}$$

The conditional variance of the return at time t, h_t, is defined as

$$h_t = E\left[(R_t - \mu_t)^2 \middle| \Psi_{t-1}\right]. \tag{6}$$

Typically, $\Psi_{t\text{-}1}$ consists of all linear functions of the past returns. In a GARCH(1,1) specification, the conditional mean is:

$$r_t = \mu_t + \xi L_t + \sqrt{h_t}\,\varepsilon_t \tag{7}$$

where μ_t is a constant, L_t is a vector of exogenous variables, $E(\varepsilon_t | \psi_{t\text{-}1}) = 0$ and $Var(\varepsilon_t | \psi_{t\text{-}1}) = 1$. The conditional variance for the standard GARCH(1,1) model with exogenous variables is:

$$h_t = \omega + \alpha_1 (r_{t\text{-}1} - \mu_{t\text{-}1} - \xi \mathrm{L}_{t\text{-}1})^2 + \beta_1 h_{t\text{-}1} + \lambda_i X_{i,t} = \omega + \alpha_1 \varepsilon_{t\text{-}1}^2 + \beta_1 h_{t\text{-}1} + \lambda_i X_{i,t}\,. \tag{8}$$

The conditional variance consists of four terms: a constant (ω), the prior shocks $\varepsilon_{t\text{-}1}^2$ (ARCH term), the past variance $h_{t\text{-}1}$ (GARCH term), and a set of exogenous volatility regressors $X_{i,t}$. The ARCH term captures the tendency of volatility clustering, i.e. if large (small) price changes are followed by other large (small) price changes albeit of unpredictable sign. A high α_1 coefficient signalizes that large surprises induce relatively large revisions in future volatility. The persistence in volatility is measured by the coefficient of the GARCH term β_1. The last term in equation (8) captures the impact of exogenous (e.g., economic and political) variables on volatility. The model can be estimated via maximum likelihood where the distribution of the innovations $\varepsilon_{t\text{-}1}$ is assumed to be Gaussian. However, as Bollerslev and Wooldridge (1992) show, maximum likelihood estimation of GARCH parameters yields consistent results even if innovations are not Gaussian, although the standard errors have to be adjusted for residuals deviating from normality. We therefore apply Bollerslev and Wooldridge semi-robust standard errors throughout our estimations.

There is strong evidence that changes in prices at time $t-1$ and the conditional variance of returns at t are negatively correlated (e.g. Black 1976). In order to assess the robustness of our estimations once we account for volatility reacting more strongly to negative than to positive information, we apply the threshold GARCH(1,1) (also called TARCH(1,1)) model proposed by Glosten et al. (1993) to analyze the volatility dynamics specified by:

$$h_t = \omega + \alpha_1 \varepsilon_{t\text{-}1}^2 + \beta_1 h_{t\text{-}1} + \delta_{t\text{-}1} \gamma_1 \varepsilon_{t\text{-}1}^2 + \lambda_i X_{i,t} \tag{9}$$

where δ_{t-1} is an indicator variable which equals 1 if the price innovation at time t-1 was negative and takes on the value 0 if a positive shock occurred. The TARCH model thus assumes that positive price innovations at time t have an effect on volatility in $t+1$ equal to α_1. In case of a negative shock ($\delta_{t-1} = 1$) the conditional variance additionally increases by $\gamma_1 \varepsilon_{t-1}^2$ and the combined marginal effect on volatility is picked up by the sum of the coefficients $\alpha_1 + \gamma_1$. If a leverage effect exists, the coefficient γ_1 is positive, because negative price innovations more strongly affect volatility than positive innovations of the same magnitude.

Before turning to the results, note that we tested the stationarity of all variables. Since in almost all cases these were trend-dominated the Augmented Dickey-Fuller (ADF) test failed to reject the null of non-stationarity. Therefore, all variables enter the estimation in logs and, if necessary to achieve stationarity, first differenced. After this transformation, the ADF test soundly rejected the null of non-stationarity.

5. Findings

First, consider the results for the aero-defense sector, which should benefit from a right-leaning government (see table 2). Since theoretically, higher expected profitability leads to higher demand for stocks, we need to include the variable *Trading Volume*, which measures the number of sector shares traded at German stock exchanges, and its interaction with the electoral probability of a right-leaning government ($\Pr_t(Right)$). The coefficient of this multiplicative term therefore is of main interest for evaluating our hypotheses. Turning to the mean equation, the coefficient of the interaction term (Trading Volume x $\Pr_t(Right)$) is positive and highly significant in the baseline model (table 2, I) controlling for the lagged Dow Jones return only. Subsequently, more variables are included in order to account for influences from other possibly relevant factors such as the inflation rate or the day of the week effect (*Monday*). The coefficient of interest does not change if we estimate the equation with a comprehensive set of additional controls such as the number of votes of CDU-led states in the second chamber (*2nd Chamber-CDU*), the political shock associated with the *Early Election 2005*, elections taking place in one of the German states, the crisis of the

European monetary system in September 1992, and the terrorist attacks on September 11th 2001. Also with regard to significance the multiplicative term remains robust against political and economic control variables (table 2, models II and III).

The estimates for our variance equation support the hypothesis that electoral prospects of a right-wing coalition are positively related to the volatility of aero-defense sector returns via trading volume. Again, this result remains robust against influences from other variables (table 2, models II and III). Also, an increase in electoral uncertainty, which can be interpreted as a signal of relative policy stability in a consensus democracy like Germany, exerts the hypothesized negative influence on aero-defense sector return volatility. Both coefficients do not change once we add the full set of control variables and they remain highly significant.

To investigate the robustness of these results we re-estimated all equations using a TARCH(1,1) model which accounts for asymmetric effects of past price innovations (Table 2, models IV-VI). As can be seen from the significantly positive coefficient $\hat{\gamma}$ there is an additional increase in volatility if the past price change was negative. Thus, on average, negative price innovations more strongly affect volatility than positive innovations of the same magnitude. Note that the parameters of interest remain highly significant and experience only a marginal reduction in magnitude, which provides additional confidence in the results. As we are also interested in knowing how strong changing expectations about government partisanship influence sector returns, we simulated an increase in the probability of a right-leaning government from one standard deviation below to one standard deviation above the variable's mean. Using point estimates from the TARCH estimation which includes all additional covariates, we can see that such an increase triggers returns to additionally increase by approximately 8 percent, while volatility rises by approximately 6 percent on average. An analogous simulation shows that electoral uncertainty causes volatility to decrease by 0.5 percent.

- table 2 about here -

The results for the pharmaceutical sector (table 2, VII-XII) suggest that expected government partisanship does not systematically affect the mean of returns in this industry. However, it does matter for return volatility. The probability of a right-wing government winning the next election is associated with a reduction in volatility, although this is clearly at odds with what we expected to find. Simulating a change in the electoral probability of a right-leaning government from one standard deviation below to one standard deviation above the mean of this variable shows that on average this is associated with a volatility reduction by 1 percent.

Electoral uncertainty does not seem to exert any systematic influence on return volatility in the pharmaceutical sector, as this variable fails to reach conventional significance levels. Table 2 also offers detailed diagnostic tests for each model we estimated. Note that all GARCH and TARCH estimations do not suffer from autocorrelation in the residuals as the results from the Ljung-Box test for five lags (Q(5)) clearly suggest. However, there is information left in the squared residuals ($Q^2(5)$) of our GARCH estimations, but as already mentioned above, we adjust for heteroscedastic disturbances by using Bollerslev-Wooldridge semi robust standard errors. Since the Lagrange multiplier test fails to reject the null of no ARCH effects for models I-VI and XI-XII, we conclude that the volatility dynamics were substantially reduced. Also, as the diagnostic tests for the TARCH estimations indicate, accounting for asymmetric effects of past price changes on volatility turns out to have been the right decision, since the squared residuals are no longer significantly autocorrelated.

Table 3 shows the results for the alternative energy and consumer sector, which both should benefit from a left-leaning coalition holding office. Consider the alternative energy sector first. The parameter estimate of interest (Trading Volume x $\Pr_t(Left)$) is positive and significant (table 3, model I). This suggests that on average an increase in the electoral prospects of a left-wing coalition triggers higher returns in the alternative energy sector. Note that this coefficient does only marginally change if we include additional control variables (table 3, models II and III). An increase in electoral probabilities from on standard deviation below to one standard deviation above the mean of this variable and using the point estimates from the full GARCH specification shows that this leads to an increase in returns by 21.3 percent on average. This may seem considerable, but is not surprising, since the alternative energy industry operates in a young and fast-growing market.

However, the findings for return volatility of the alternative energy sector do not confirm our hypothesis. As the coefficient of the multiplicative term is not significant, the probability of a left-leaning government is not systematically associated with volatility. Nevertheless, sector return volatility is not immune to the political process, since electoral uncertainty exerts a negative influence on volatility. If we manipulate electoral uncertainty in the same way as before, volatility decreases by 1.4 percent on average. A re-estimation of all specifications applying a TARCH model does not lead to changes in the estimates that would be worth mentioning (table 3, models IV-VI). Since the TARCH-coefficient γ fails to reach conventional significance levels and is of negative sign, we conclude that no improvement in estimation efficiency can be achieved by accounting for asymmetric effects of past price innovations.

- table 3 about here -

Moving on to the consumer sector, the estimates from our mean equation do not support the hypothesis of returns being higher in response to improved electoral prospects of a left-leaning coalition. Thus, changing government partisanship seems to result in neither profit nor loss if we consider this industry. One explanation for this finding could be that even though left- and right-leaning parties differ on many issues, they are not able or willing to effectively cause changes in real wages, and investors may incorporate this in their expectations. However, volatility of the consumer sector seems to positively co-vary with the probability of a left-wing government. The coefficient is robust against additional control variables and re-estimation using a TARCH model. Calculating the substantive effect in the same way as above shows that in response to an increase in the probability of a left-leaning government, consumer sector return volatility increases by 3.3 (3.4) percent on average if we use point estimates from our full GARCH (TARCH) specification.

Additionally, we can use the volatility parameter estimates to get an impression of the persistence of shocks in the conditional variance of sector returns. This can easily be computed by summing up $\hat{\alpha}_1$ and $\hat{\beta}_1$ in case of a GARCH and $\hat{\alpha}_1$, $\hat{\beta}_1$, and $\frac{1}{2}\hat{\gamma}_1$ in case of a TARCH model. For all our specifications this value ranges from 0.90 to 0.97, except for the alternative energy sector returns where the value ranges from 0.80 to 0.85, which suggests that persistence is somewhat lower in this industry. In any case, the sum of the GARCH coefficients is smaller than 1, and therefore all sector returns exhibit a mean-reverting behavior.

In sum, we find support for government partisanship affecting the performance of industrial sectors, albeit the effect is not always of the hypothesized sign. The findings suggest, that the aero-defense industry is expected to fare better under a right-leaning government, while the opposite relationship seems to hold for the pharmaceutical sector. As one would expect, the alternative energy sector is much more likely to perform better under a left-leaning government. However, the consumer industry does not systematically benefit from a left-leaning coalition holding office, although volatility of the consumer sector returns seem to positively co-vary with the probability of a left government. With regard to electoral uncertainty, the estimates lend support to the hypotheses of increasing uncertainty about the election outcome reducing stock return volatility. The theoretical explanation is that in consensus democracies, electoral closeness signals relative future economic policy stability, which implies less policy risk.

6. Conclusion

Partisan models of government (Hibbs 1977, 1987; Alesina et al. 1997, Alesina 1987) relate economic policies and parties' ideologies. Based on the corollary that parties try to implement their ideologically determined ideal policies, we offer the first study of sector-specific consequences of government partisanship and electoral uncertainty in Germany. On the basis of parties offering and implementing different economic policies our identification strategy draws on the idea that if rational investors are interested in maximizing their wealth, the effect of future political developments and decisions will be incorporated in today's stock prices. On the aggregate level, price changes will reflect the expected impact of policies on future profits, by that indicating the direction and the strength of wealth transfers as a consequence of government partisanship.

Estimates from GARCH(1,1) and TARCH(1,1) volatility models confirm that returns of the aerospace-defense, alternative energy, pharmaceutical and consumer sectors were indeed influenced by the probability of ideologically different coalitions winning the next election. More precisely and in line with our hypothesis, the aero-defense industry seems to benefit from a right-leaning government and better electoral prospects of a right-wing coalition cause an increase in return volatility. However, this relationship does not hold for the pharmaceutical sector. In case of a left-wing government, the performance of the alternative energy sector improves. While returns in the consumer industry are not significantly affected by expected government partisanship, the electoral prospects of a left-leaning coalition are associated with higher volatility. The effect remains robust against additional control variables and re-estimation using a specification which accounts for negative price changes having a stronger impact on volatility as positive innovations of the same magnitude.

On theoretical grounds, unlike in Westminster systems, electoral closeness does not imply policy uncertainty in consensus democracies (Lijphart 1999). Instead, since a close election is more likely to produce an ideologically heterogeneous government, and because in such a case government policies result from a bargaining process between left and right parties, grave policy changes are less likely to occur. Thus, in consensus democracies like Germany, electoral uncertainty might actually signal relative future economic policy stability, which implies less policy risk.

The empirical evidence indeed suggests that with increasing closeness of an election, stock return volatility decreases. This might be interpreted as a first tentative hint, that a close election provides very different information in Westminster and in consensus democracies. We are deliberately cautious not to draw strong inferences from this result, since in order to empirically assess how a system type affects the impact of electoral uncertainty, cross-sectional data needs to be analyzed. Also a more detailed analysis of the policy instruments used by different parties could provide valuable insights, since our data does not allow us to disentangle empirically which policy instruments (taxation, tariffs, subsidies, …) different parties in government apply to bring about specific redistribution across industrial sectors. We leave these tasks to subsequent research.

Literature

Adams, James/Clark, Michael/Ezrow, Lawrence/Glasgow, Garrett (2004): Understanding Change and Stability in Party Ideologies: Do Parties Respond to Public Opinion or to Past Election Results?, in: British Journal of Political Science Vol. 34 (4): 589-610.

Alesina, Alberto (1987): Macroeconomic Policy in a Two-Party-System as a Repeated Game, in: Quarterly Journal of Economics 102 (3): 651-78.

Alesina, Alberto/Roubini, Nouriel/Cohen, Gerald (1997): Political Cycles and the Macroeconomy. Cambridge (Mass.): MIT Press.

Ashworth, Scott (2006): Campaign Finance and Voter Welfare with Entrenched Incumbents, in: American Political Science Review 100 (1): 55-68.

Austen-Smith, David (1995): Campaign Contributions and Access, in: American Political Science Review 89 (3): 566-581.

Baron, David P. (1989): Service-Induced Campaign Contributions and the Electoral Equilibrium, in: Quarterly Journal of Economics 104 (1): 45-72.

Benoit, Kenneth/Laver, Michael (2006): Party Policy in Modern Democracies. London: Routledge.

Bernhard, William/Leblang, David (2006): Democratic Processes and Financial Markets: Pricing Politics. Cambridge: Cambridge University Press.

Binder, John J. (1985): Measuring the Effects of Regulation with Stock Price Data, in: Rand Journal of Economics 16 (2): 167-183.

Black, Fischer (1976): Studies in Stock Price Volatility Changes, Proceedings of the 1976 Meeting of the Business and Economic Statistics Section, American Statistical Association: 177-181.

Bollerslev, Tim/Wooldridge, Jeffrey M. (1992): Quasi-Maximum Likelihood Estimation and Inference in Dynamic Models with Time-Varying Covariances, in: Econometric Review 11 (2): 143-172.

Brander, James A. (1991): Election polls, free trade, and the stock market: evidence from the 1988 Canadian general election, in: Canadian Journal of Economics 24 (4): 827-43.

Brownars, Stephen G./Lott John R. (1997): Do Campaign Donations Alter How a Politician Votes? Or, Do Donors Support Candidates Who Value the Same Things That They Do?, in: Journal of Law and Economics 40 (2): 317-350.

Budge, Ian/Klingemann, Hans-Dieter/Volkens, Andrea/Bara, Judith/Tanenbaum, Eric (2001): Mapping Policy Preferences. Estimates for Parties, Electors and Governments 1945-1998. Oxford: Oxford University Press.

Budge, Ian/Hofferbert, Richard/Klingemann, Hans-Dieter (1994): Parties, Policies, and Democracy. Boulder, San Francisco, Oxford: Westview Press.

Calmfors, Lars/Driffill, John/Honkapohja, Seppo/Giavazzi, Francesco (1988): Bargaining Structure, Corporatism and Macroeconomic Performance, in: Economy Policy 3 (6): 14-61.

Cheng, Yingmei (2005): Portfolios and Politics: The 2004 Presidential Election, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=664047; 21.06.2006.

Cohen, Gerald D. (1993): Pre- and Post-Electoral Macroeconomic Fluctuations. Harvard University.

Debus, Marc (2006): The Impact of Pre-Electoral Alliances on Patterns of Party Competition and Coalition Politics. Phd Diss., University of Konstanz.

Downs, Anthony (1957): An Economic Theory of Democracy. New York: Harper.

Engle, Robert F. (2001): GARCH 101: The Use of ARCH/GARCH Models in Applied Econometrics, in: Journal of Economic Perspectives 15 (4): 157-68.

Fama, Eugene F. (1970): Efficient Capital Markets: A Review of Theory and Empirical Work, in: Journal of Finance 25 (2): 383-417.

Foerster, Stephen R./Schmitz, John J. (1997): The Transmission of U.S. Electoral Cycles to International Stock Returns, in: Journal of International Business Studies 28 (1): 1-27.

Gärtner, Manfred/Wellershoff, Klaus W. (1995): Is there an Election Cycle in American Stock Returns?, in: International Review of Economics and Finance 4 (4): 387-410.

Gallant, Ronald A./Rossi, Peter E./Tauchen, George (1992): Stock Prices and Volume, in: Review of Financial Studies 5 (2): 199-242.

Genmill, Gordon (1992): Political Risk and Market Efficiency: Tests based in British Stock and Options Markets in the 1987 Election, in: Journal of Banking and Finance 19 (1): 211-31.

Glosten, Lawrence P./Jagannathan, Ravi/Runkle, David E. (1993): On the Relation between the Expected Value and the Volatility of the Nominal Excess Return on Stocks, in: Journal of Finance 48 (5): 1779-1801.

Glosten, Lawrence P./Milgrom, Paul R. (1985): Bid, Ask and Transaction Prices in a Specialist Market with Heterogeneously Informed Traders, in: Journal of Financial Economics 14 (1): 71-100.

Gordon, Sanford C./Hafer, Catherine (2005): Flexing Muscle: Corporate Political Expenditures as Signals to the Bureaucracy, in: American Political Science Review 99 (2): 245-261.

Grenzke, Janet M. (1989): Candidate Attributes and PAC Contributions, in: Western Political Quarterly 42 (2): 245-264.

Grossman, Gene M./Helpman, Elhanan (2001): Special Interest Politics. Princeton: MIT Press.

Grossman, Gene M./Helpman, Elhanan (1994): Protection for sale, in: American Economic Review 54 (4): 833-850.

Hall, Richard L./Deardorff, Alan v. (2006): Lobbying as Legislative Subsidy, in: American Political Science Review 100 (1): 69-84.

Hall, Richard l./Wayman, Frank W, (1990): Buying Time: Moneyed Interests and the Mobilization of Bias in Congressional Committees, in: American Political Science Review 84 (4): 797-820.

Herron, Michael C. (2000): Estimating the Economic Impact of Political Party Competition in the 1992 British Election, in: American Journal of Political Science 44 (2): 320-31.

Herron, Michael C./Lavin, James/Cram, Donald/Silver, Jay (1999): Measurement of Political Effects in the United States Economy: A Study of the 1992 Presidential Elections, in: Economics and Politics 11 (1): 51-79.

Hibbs, Douglas (1987): The American Political Economy. Macroeconomics and Electoral Politics. Cambridge (Mass.)/London: Harvard University Press.

Hibbs, Douglas (1977): Political Parties and Macroeconomic Policy, in: American Political Science Review 71 (4): 1467-1487.

Hinich, Melvin J./Munger, Michael C. (1997): Analytical Politics. Cambridge: Cambridge University Press.

Höpner, Martin (2006): Beiträge der Unternehmen zur Parteienfinanzierung. Wer spendet an wen und warum?, in: Zeitschrift für Parlamentsfragen 2/2006: 293-312.

Hojnacki, Marie/Kimball, David (1999): Organized Interests and the Decision of Whom to Lobby in Congress, in: American Political Science Review 92 (4): 775-790.

Hojnacki, Marie/Kimball, David (1998): The Who and How of Organizations Lobbying Strategies in Committee, in: Journal of Politics 61 (4): 999-1024.

Huang, Roger (1985): Common Stock Returns and Presidential Elections, in: Financial Analysts Journal 41 (2): 24-39.

Jensen, Nathan M./Schmith, Scott (2005): Market Responses to Politics. The Rise of Lula and the Decline of the Brazilian Stock Market, in: Comparative Political Studies 38 (10): 1245-70.

Kern, Holger Lutz/Hainueller, Jens (2006): Electoral Balancing, Divided Government, and Midterm Loss in German State Elections, in: Journal of Legislative Studies 12 (2): 127-149.

Knight, Brian (2006): Are policy platforms capitalized into equity prices? Evidence from the Bush/Gore 2000 Presidential Election, in: Journal of Public Economics 90 (4-5): 751-773.

Leblang, David/Mukherjee, Bumba (2005): Government Partisanship, Elections, and the Stock Market: Examining American and British Stock Returns, in: American Journal of Political Science: 49 (4): 780-802.

Leblang, David/Mukherjee, Bumba (2004): Presidential Elections and the Stock Market: Comparing Markov-Switching and (FIE)GARCH Models of Stock Volatility, in: Political Analysis 12 (3): 296-322.

Lijphart, Arend (1999): Patterns of Democracy: Government form and performance in thirty-six countries. New Haven: Yale University Press.

Mattozzi, Andrea (2004): Can We Insure Against Political Uncertainty? Evidence from the U.S. Stock Market, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=644583, 21.06.2006.

McGillivray, Fiona (2004): Privileging Industry: The Comparative Politics of Trade and Industrial Policy. Princeton: Princeton University Press.

McGillivray, Fiona (2003): Redistributive Politics and Stock Price Dispersion, in: British Journal of Political Science 33 (3): 367-395.

Niederhoffer, Victor/Gibbs, S./Bullock, J. (1970): Presidential Elections and the Stockmarket, in: Financial Analysts Journal (March-April): 111-113.

OECD (2004): Wage-setting Institutions and Outcomes, OECD Employment Outlook, Paris.

Pappi, Franz Urban/Shikano, Susumu (2004): The Positions of Parties in Ideological and Policy Space: The Perception of German Voters of their Party System. Mannheim. MZES Working Paper 73. http://www.mzes.uni-mannheim.de/publications/wp/wp-73.pdf; 01.12.2006.

Pappi, Franz Urban/Shikano, Susumu (2003): Schröders knapper Sieg bei der Bundestagswahl 2002, in: Zeitschrift für Politik 50 (1): 1-16.

Persson, Torsten/Tabellini, Guido (2000): Political Economics. Explaining Economic Policy. Cambridge (Mass.)/London: MIT Press.

Roberts, Brian E. (1990): Political Institution, Policy Expectations, and the 1980 Election, in: American Journal of Political Science 34 (2): 289-310.

Schneider, Gerald/Tröger, Vera (2006): War and the World Economy: Stock Market Reactions to International Conflicts, 1990-2000, in: Journal of Conflict Resolution 50 (5): 623-645.

Sebaldt, Martin/Straßner, Alexander (2004): Verbände in der Bundesrepublik Deutschland. Eine Einführung. Wiesbaden.

Siokis, Fotios and Kapopoulos, Panayotis (2007): Parties, Elections and Stock Market Volatility: Evidence from a Small Open Economy, in: Economics and Politics 19 (1): 123-134.

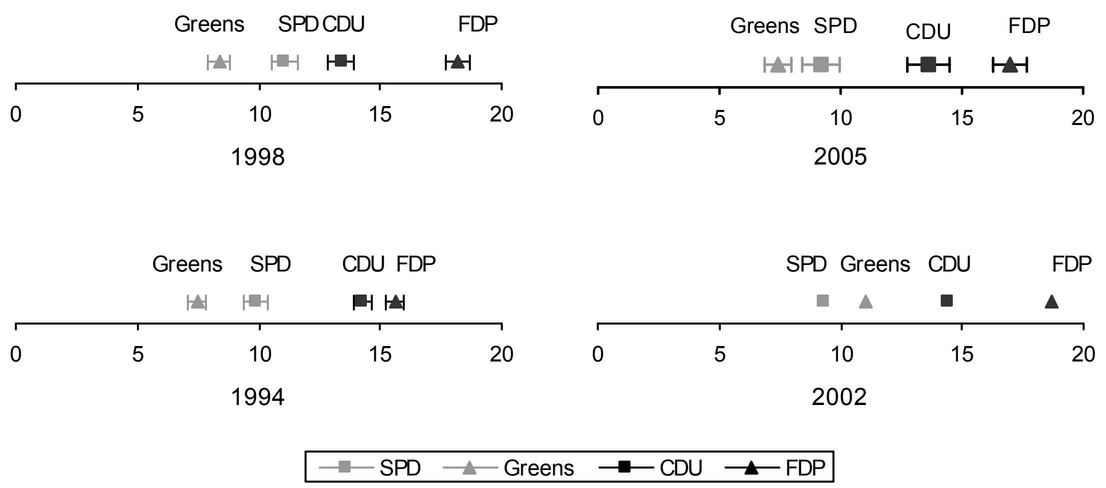
Stigler, George J./Friedland, Claire (1962): What Can Regulators Regulate? The Case of Electricity, in: Journal of Law and Economics 5 (1): 1-16.

Snyder, James (1990): Campaign Contributions as Investments: The U.S. House of Representatives 1980-86, in: Journal of Political Economy 98 (6): 1195-1227.

Tsebelis, George (1990): Nested Games. Rational Choice in Comparative Politics. Berkeley: University of California Press.

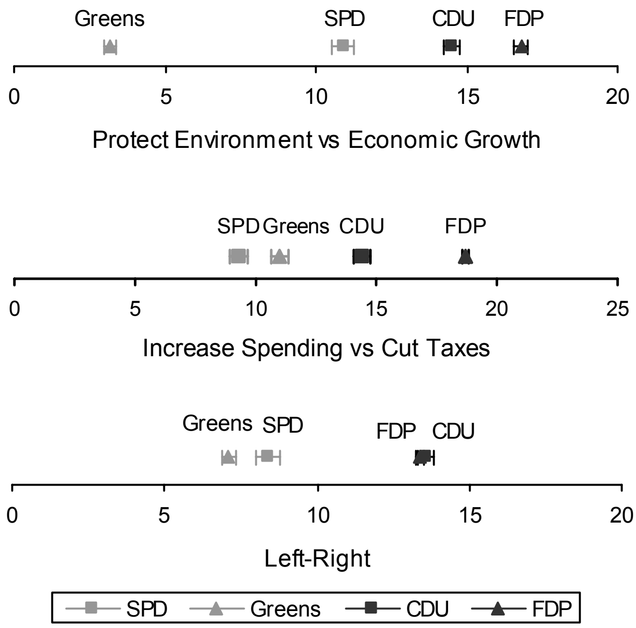
Vuchelen, Jef (2003): Electoral Systems and the Effects of Political Events on the Stock Market: The Belgian Case, in: Economics and Politics 15 (1): 85-102.

Figure 1: German parties' ideal points on the left-right dimension (1994, 1998, 2002, 2005)



Estimates based on a wordscore analyses of party manifestoes. 95-percent confidence intervals shown. No standard errors available for 2002. Data source: Debus (2006).

Figure 2: German parties' ideal points on three issue dimensions in 2002



Ideal point estimates based on expert interviews. Data source: Benoit/Laver 2006: Appendix B.

Figure 3: Continuously compounded returns of the aero-defense, alternative energy, pharmaceutical, and consumer sector

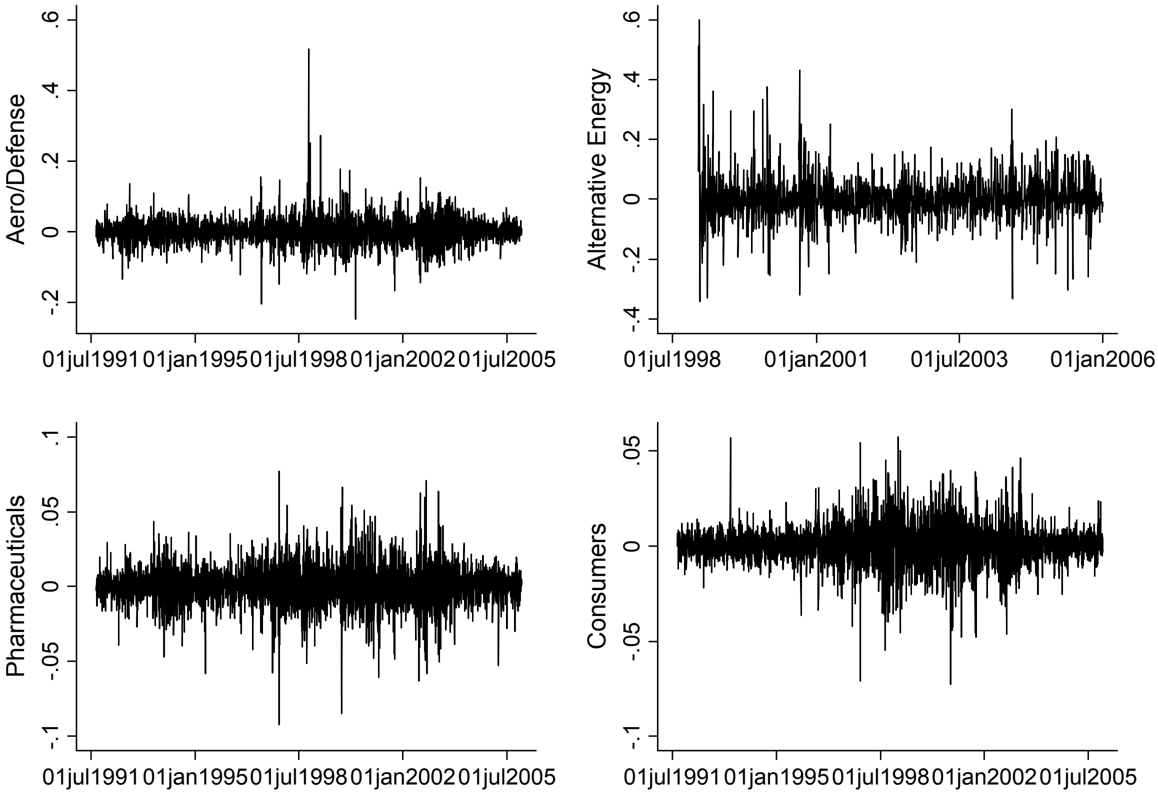


Figure 4: The Probability of a Right-(Left-)Wing Government 1991-2005

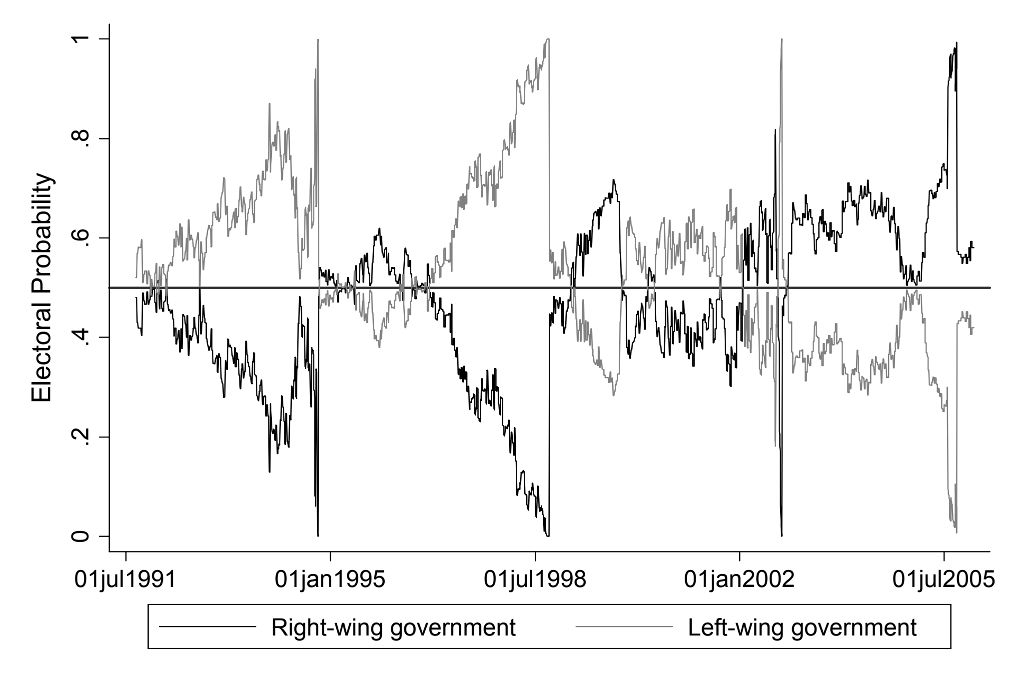


Table 1: Descriptive statistics

	Mean	Min	Max	St.dev.	Skewness	Kurtosis	JB test
Aero-Defense Sector							
Return	0.0615	-24.6681	51.7542	3.5383	1.0090	19.2859	40,563***
Trading Volume	4,417.05	30.00	68,639.40	4,141.40	3.0649	30.7942	122,053***
Pharmaceutical Sector							
Return	0.0436	-9.2116	7.7235	1.3033	-0.2041	7.2108	2,695.853***
Trading Volume	736.44	7.00	23,969.00	1,103.55	4.7323	67.0575	631,737.3***
Alternative Energy Sector							
Return	0.2554	-34.2414	60.0194	7.3576	1.0043	12.1180	6,501.685***
Trading Volume	312.21	2.30	6,498.10	551.32	4.4081	30.8233	63,498.86***
Consumer Sector							
Return	0.0447	-7.2777	5.7509	1.0203	-0.1094	7.7859	3,457.236***
Trading Volume	430.22	2.00	17,641.00	873.30	7.3914	104.607	1,588,398***
Other Variables							
Dow Jones Returns	0.0435	-7.4541	6.1543	1.0006	-0.2527	7.9448	3,721.39***
Interest Rate	4.2151	1.4000	9.8000	2.1719	1.2810	3.6487	1,052.00***
Inflation Rate	2.0949	0.2000	6.3200	1.3811	1.4729	4.5521	1,670.42***
$\Pr_t(Right)$	46.8891	0.0000	99.3430	16.2687	-0.3362	3.5612	115.5718***
$\Pr_t(Left)$	53.1109	0.6570	100.0000	16.2687	0.3362	3.5612	115.5718***
Electoral Uncertainty	89.0290	0.0000	100.0000	18.2262	-2.9084	11.6130	16,274.96***
2^{nd}Chamber-CDU	32.1864	24.000	51.000	6.1788	1.3300	4.2504	1301.785***
2^{nd}Chamber-SPD	36.5130	18.000	45.000	6.0692	-1.2879	4.2635	123.046***

Mean, min, max, and standard deviation (St.dev.) in percentages except for trading volume (in '000). ***, **, and * denote statistical significance at the .10, .05 and .01 level. JB = Jarque-Bera test for normal distribution. For all sector series the number of return observations equals T = 3,615 except for the alternative energy sector, where T = 1,790.

Table 2: GARCH Models for Logged Changes in Sector Returns (T = 3,615)

Parameters	Aero-Defense (GARCH)			Aero-Defense (TARCH)			Pharmaceuticals (GARCH)			Pharmaceuticals (TARCH)		
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Mean equation												
$\Delta\,\Pr_t\,(Right)$	0.021	0.025	0.020	0.027	0.032	0.027	0.016*	0.016**	0.019**	0.019**	0.022*	0.022***
	(0.025)	(0.024)	(0.025)	(0.025)	(0.024)	(0.024)	(0.008)	(0.008)	(0.008)	(0.009)	(0.013)	(0.005)
ΔTrading Volume	0.004***	0.005***	0.005***	0.004***	0.006***	0.006***	0.000	0.000	0.001	0.000	0.001***	0.001***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)
Trading Volume x $\Pr_t\,(Right)$	0.103**	0.121***	0.124***	0.094***	0.106***	0.110***	0.020	0.021	0.019	0.020	0.013	0.014
	(0.044)	(0.042)	(0.039)	(0.029)	(0.028)	(0.028)	(0.014)	(0.014)	(0.014)	(0.015)	(0.012)	(0.011)
ΔDow $Jones_{t-1}$	0.740***	0.742***	0.719***	0.730***	0.724***	0.697***	0.251***	0.250***	0.239***	0.240***	0.222***	0.220***
	(0.063)	(0.060)	(0.061)	(0.060)	(0.057)	(0.057)	(0.025)	(0.025)	(0.025)	(0.024)	(0.023)	(0.022)
ΔInflation		-0.001	-0.091		-0.000	-0.014		0.062	-0.092		-0.118	-0.221
		(0.026)	(0.026)		(0.026)	(0.025)		(0.0242	(0.293)		(0.324)	(0.302)
Monday		0.593***	0.610***		0.598***	0.631***		-0.006	0.004		0.026	0.027
		(0.116)	(0.119)		(0.112)	(0.111)		(0.050)	(0.044)		(0.057)	(0.039)
$\Delta 2^{nd}$ Chamber-CDU			-0.001			-0.074			-0.127			-0.178
			(0.310)			(0.308)			(0.127)			(0.133)
Early Election 2005			0.847*			1.125**			-0.073			-0.001
			(0.449)			(0.490)			(0.111)			(0.097)
Constant	-0.609**	-0.860***	-0.876***	-0.598***	-0.860***	-0.863***	-0.070	-0.073	-0.068	-0.085	-0.060	-0.059
	(0.303)	(0.290)	(0.270)	(0.205)	(0.290)	(0.197)	(0.072)	(0.075)	(0.073)	(0.079)	(0.567)	(0.055)

Table 2 continues on the next page

Parameters	Aero-Defense (GARCH)			Aero-Defense (TARCH)			Pharmaceuticals (GARCH)			Pharmaceuticals (TARCH)		
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Variance equation												
$\hat{\alpha}$	0.202*** (0.045)	0.194*** (0.039)	0.187*** (0.041)	0.168*** (0.050)	0.150*** (0.042)	0.139*** (0.038)	0.139*** (0.019)	0.134*** (0.018)	0.141*** (0.019)	0.098*** (0.018)	0.093*** (0.015)	0.073*** (0.014)
$\hat{\beta}$	0.707*** (0.034)	0.737*** (0.033)	0.727*** (0.033)	0.703*** (0.032)	0.744*** (0.028)	0.748*** (0.024)	0.776*** (0.026)	0.786*** (0.025)	0.782*** (0.024)	0.802*** (0.022)	0.781*** (0.021)	0.825*** (0.018)
$\hat{\gamma}$				0.137*** (0.042)	0.144*** (0.037)	0.159*** (0.035)				0.077** (0.031)	0.095*** (0.029)	0.091*** (0.024)
$\Delta\,\Pr_t(Right)$	0.279* (0.170)	0.294*** (0.133)	0.335** (0.145)	0.269* (0.160)	0.279*** (0.121)	0.297** (0.111)	0.017 (0.013)	0.016 (0.012)	0.021* (0.012)	0.021 (0.015)	0.018 (0.011)	0.019** (0.008)
ΔTrading Volume	0.052*** (0.002)	0.049*** (0.003)	0.052*** (0.003)	0.052*** (0.002)	0.051*** (0.003)	0.051*** (0.003)	0.009*** (0.001)	0.009*** (0.001)	0.008*** (0.001)	0.009*** (0.001)	0.007*** (0.000)	0.007*** (0.000)
Trading Volume x $\Pr_t(Right)$	0.241*** (0.044)	0.180*** (0.048)	0.153*** (0.045)	0.170*** (0.055)	0.104** (0.047)	0.081* (0.043)	-0.008 (0.006)	-0.012* (0.007)	-0.017*** (0.007)	-0.009* (0.005)	-0.025*** (0.005)	-0.015*** (0.004)
Electoral Uncertainty	-0.017*** (0.004))	-0.016*** (0.004)	-0.015*** (0.004)	-0.016*** (0.004))	-0.015*** (0.003)	-0.013*** (0.003)	0.001 (0.001)	0.001 (0.001	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)
Interest Rate		0.004 (0.032)	-0.012 (0.033)		0.008 (0.029)	-0.018 (0.025)		-0.007* (0.005	-0.008 (0.005)		-0.010*** (0.003)	-0.007*** (0.002)
Δ2nd Chamber-CDU			-2.115*** (0.723)			-2.264*** (0.507)			0.088 (0.134)			0.086 (0.112)
Early Election 2005			-0.926 (0.582)			-0.664 (0.436)			-0.204*** (0.030)			-0.153*** (0.025)
Constant	2.224*** (0.416)	1.687*** (0.494)	2.396*** (0.534)	2.521*** (0.477)	1.834*** (0.454)	1.783*** (0.399)	0.389*** (0.055)	0.400*** (0.068)	0.358*** (0.064)	0.289*** (0.041)	0.347*** (0.045)	0.233*** (0.036)

Table 2 continues on the next page

	Aero-Defense (GARCH)			Aero-Defense (TARCH)			Pharmaceuticals (GARCH)			Pharmaceuticals (TARCH)		
	I	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**IX**	**X**	**XI**	**XII**
Diagnostics												
AIC	5.286	5.225	5.250	5.280	5.212	5.193	3.280	3.258	3.282	3.224	3.125	3.109
SIC	5.307	5.251	5.293	5.302	5.240	5.238	3.301	3.284	3.223	3.247	3.152	3.153
LogL	-9,540.01	-9,426.47	-9,462.92	-9,527.32	-9,402.71	-9,358.14	-5,915.44	-5,872.82	-5,723.18	-5,813.57	-5,630.27	-5,591.36
J.B. test	4,816.6***	3,622.5***	4,084.0***	4,190.9***	3,069.0***	2,705.4***	468.85***	464.41***	404.55***	551.46***	344.42***	288.39***
ARCH LM(1) test	0.322	0.169	0.265	0.057	0.011	0.002	12.835***	11.395***	4.952**	6.156**	2.337	5.086**
Q(5)	6.869	6.478	5.646	6.488	6.038	5.374	5.188	5.808	4.429	4.788	3.306	3.530
$Q^2(5)$	12.070**	9.983	12.757**	8.717	5.931	6.311	41.419***	35.803***	15.636***	17.228***	7.225	10.350

Coefficients shown with Bollerslev and Wooldridge semi robust standard errors in parentheses. ***, **, and * denote statistical significance at .10, .05 and .01 level. The mean and the variance equation of models III, VI, IX, and XII include additional indicator variables controlling for the crisis of the European monetary system in September 1992, the terrorist attacks on September 11th 2001, and state elections (coefficients not shown to conserve space).

Table 3: GARCH and TARCH Models for Logged Changes in Sector Returns (T = 1,788 (Alternative Energy) / 3,614(Consumers))

Parameters		**Alternative Energy (GARCH)**			**Alternative Energy (TARCH)**			**Consumers (GARCH)**			**Consumers (TARCH)**	
	I	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**IX**	**X**	**XI**	**XII**
Mean equation												
Δ $\Pr_t$ (*Left*)	0.005	-0.003	-0.021	0.010	-0.001	-0.014	-0.007	-0.010	-0.011	-0.007	-0.008	-0.011
	(0.152)	(0.149)	(0.137)	(0.150)	(0.148)	(0.136)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
ΔTrading Volume	0.003	0.004	0.003	0.004	0.003	0.003	0.000	-0.000	0.000	0.000	0.000	-0000
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Trading Volume x	0.329***	0.323***	0.342***	0.315***	0.304***	0.336***	-0.005	-0.000	0.001	-0.006	-0.009	0.004
$\Pr_t$ (*Left*)	(0.102)	(0.102)	(0.100)	(0.102)	(0.102)	(0.100)	(0.010)	(0.009)	(0.009)	(0.009)	(0.010)	(0.009)
ΔDow Jones$_{t-1}$	0.856***	0.858***	0.862***	0.854***	0.856***	0.863***	0.207***	0.217***	0.218***	0.207***	0.201***	0.221***
	(0.128)	(0.129)	(0.131)	(0.129)	(0.129)	(0.131)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)
ΔInflation		0.098*	0.100*		0.095*	0.098*		0.005	0.005		0.007	0.005
		(0.054)	(0.053)		(0.054)	(0.053)		(0.006)	(0.006)		(0.006)	(0.006)
Monday		0.704**	0.754**		0.648**	0.717**		-0.041	-0.039		-0.006	-0.036
		(0.336)	(0.322)		(0.335)	(0.324)		(0.033)	(0.032)		(0.032)	(0.032)
Δ2ndChamber-SPD			-0.164			-0.163*			0.004			0.033
			(0.101)			(0.098)			(0.161)			(0.138)
Early Election 2005			-0.653			-0.881			0.097			0.091
			(1.805)			(1.777)			(0.103)			(0.100)
Constant	-1.160***	-1.276***	-1.350***	-1.094***	-1.174***	-1.299**	0.059	0.057	0.046	0.062*	0.072*	0.030
	(0.392)	(0.401)	(0.393)	(0.393)	(0.398)	(0.396)	(0.036)	(0.037)	(0.035)	(0.036)	(0.038)	(0.035)

Table 3 continues on the next page

Parameters	Alternative Energy (GARCH)			Alternative Energy (TARCH)			Consumers (GARCH)			Consumers (TARCH)		
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Variance equation												
$\hat{\alpha}$	0.156***	0.150***	0.152***	0.166***	0.159***	0.161***	0.143***	0.150***	0.152***	0.150***	0.112***	0.146***
	(0.028)	(0.028)	(0.026)	(0.045)	(0.044)	(0.041)	(0.018)	(0.019)	(0.020)	(0.023)	(0.020)	(0.023)
$\hat{\beta}$	0.687***	0.692***	0.702***	0.689***	0.694***	0.706***	0.801***	0.794***	0.781***	0.784***	0.825***	0.767***
	(0.045)	(0.046)	(0.043)	(0.045)	(0.046)	(0.043)	(0.024)	(0.024)	(0.024)	(0.025)	(0.023)	(0.024)
$\hat{\gamma}$				-0.019	-0.016	-0.021				0.005	0.016	0.031
				(0.053)	(0.051)	(0.047)				(0.032)	(0.028)	(0.031)
$\Delta\ \mathrm{Pr}_t\,(\mathit{Left})$	-1.384	-1.247	-0.808	-1.320	-1.220	-0.779	-0.015**	0.014**	0.013***	0.015**	0.006	0.015**
	(1.457	(1.354)	(1.062)	(1.385)	(1.322)	(1.032)	(0.007)	(0.006)	(0.006)	(0.007)	(0.006)	(0.006)
ΔTrading Volume	0.284***	0.278***	0.267***	0.282***	0.274***	0.269***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***
	(0.016)	(0.015)	(0.017)	(0.016)	(0.015)	(0.017)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Trading Volume x $\mathrm{Pr}_t\,(\mathit{Left})$	0.448	0.591	0.559*	0.452	0.581	0.540*	0.016***	0.019***	0.022***	0.019***	0.014***	0.023***
	(0.380)	(0.378)	(0.316)	(0.379)	(0.374)	(0.316)	(0.004)	(0.004)	(0.005)	(0.004)	(0.004)	(0.005)
Electoral Uncertainty	-0.041**	-0.045**	-0.033**	-0.040**	-0.046**	-0.030*	-0.000	-0.000	-0.000*	-0.000	-0.000	-0.001*
	(0.020)	(0.020)	(0.015)	(0.020)	(0.019)	(0.016)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Interest Rate		0.546	0.772		0.467	0.728		0.004**	0.003*		0.000	0.005**
		(0.533)	(0.470)		(0.524)	(0.466)		(0.002)	(0.002)		(0.001)	(0.002)
Δ2ndChamber-SPD			1.227*			1.197*			-0.004			-0.038
			(0.632)			(0.632)			(0.114)			(0.088)
Early Election 2005			3.754			3.589			-0.042**			-0.045***
			(6.365)			(5.996)			(0.017)			(0.017)
Constant	16.309***	13.839***	9.940***	16.121***	13.727***	10.035***	0.014	0.007	0.016	0.017*	0.004	0.019
	(2.826)	(3.126)	(2.676)	(2.826)	(3.100)	(2.681)	(0.009)	(0.010)	(0.011)	(0.010)	(0.008)	(0.012)

Table 3 continues on the next page

	Alternative Energy (GARCH)			Alternative Energy (TARCH)			Consumers (GARCH)			Consumers (TARCH)		
	I	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**IX**	**X**	**XI**	**XII**
Diagnostics												
AIC	6.654	6.656	6.602	6.656	6.651	6.611	2.519	2.559	2.574	2.534	2.507	2.578
SIC	6.691	6.702	6.672	6.696	6.700	6.685	2.539	2.585	2.617	2.546	2.535	2.623
LogL	-5,936.90	-5,935.01	-5,878.91	-5,937.15	-5,929.68	-5,886.29	-4,539.10	-4,609.24	-4,625.79	-4,547.56	-3,552.22	-4,633.27
J.B. test	305.08***	299.10***	206.24***	299.93***	294.61***	305.33***	1,091.6***	878.71***	1,078.9***	1,062.5***	1,207.9***	785.2***
ARCH LM(1) test	14.906***	14.513***	13.163***	14.719***	14.352***	9.614***	2.298	6.034**	2.291	1.912	3.179*	2.953**
Q(5)	13.006**	11.930**	11.365**	12.772**	11.802**	11.063**	2.908	3.772	3.739	2.920	2.605	3.392
$Q^2(5)$	24.354***	24.958***	20.938***	24.163***	23.783***	23.970***	2.941	6.199	3.589	2.440	3.701	3.614

Coefficients shown with Bollerslev and Wooldridge semi robust standard errors in parentheses. ***, **, and * denote statistical significance at .10, .05 and .01 level. The mean and the variance equation of models III, VI, IX, and XII include additional indicator variables controlling for the crisis of the European monetary system in September 1992, the terrorist attacks on September 11th 2001, and state elections (coefficients not shown to conserve space).