Political Influence on German Banking Supervision and Its Impact on Economic Growth: Empirical Evidence from Survey Data

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Abstract: Based on survey data, this paper investigates the impact of politically dependent banking supervision on the perception of financial uncertainty. There is empirical evidence that political influence has only marginal influence on the level of financial uncertainty. Introducing the unobservable construct "fundamental uncertainty", which is motivated by the implicit association test of Greenwald, McGhee, and Schwartz (1998), politically dependent supervision leads to financial expectations, which are influenced by economic policy. Therefore, only dependent banking supervision implements a link between political decisions and fundamental uncertainty and, finally, economic growth.

Keywords: Deutsche Bundesbank, Federal Financial Supervisory Authority, Implicit Association Test, Fundamental Uncertainty.

JEL Classification: E23, G28

1. INTRODUCTION

As a consequence of the the latest financial and debt crises European banking supervision will change in the following years. During the EU summit in Brussels in October 2012 the heads of State and Government decided to introduce a European banking supervision, which will be located at the European Central Bank (ECB). The centralized banking super-vision will probably cooperate with the national banking supervisory authorities in order to guarantee efficient banking supervision across Europe. Consequently, the institutional structure of the national authorities will be relevant in a more European perspective. It seems to be the right time to validate the status quo of the institutional architecture of national banking super-vision. This paper analyzes the institutional architecture of the German banking supervision with respect to economic growth effects.

In contrast to the coalition agreement of the coali-tion parties CDU, CSU and FDP the current German government decided in the year 2010 to execute the German banking supervision by the Deutsche Bundesbank and the Federal Financial Supervisory Authority (BaFin). While the Bundesbank ensures the ongoing banking supervision, the BaFin acts as an intervention authority. The Bundesbank is still politically independent and the BaFin is dependent on the Ministry of Finance. Following the Ministry of Justice (2012), according to § 7 (2) of the Banking Act (Kreditwesengesetz) the Bundesbank has to adopt the BaFin Guidelines, which are released by the Bundesbank and the BaFin. In case of conflicts the Ministry of Finance has the power of decision. Hence, banking supervision in Germany is dependent on politics. From a German legal point of view political dependence is crucial, due to the fact that the supervisory authority executes sovereign measures. Especially this point causes much attention concerning the implementation of the European supervisory authority planned for 2013. Therefore, the understand-ing of economic effects conditional on dependent versus independent banking supervision - neglecting all legal questions - seems to be currently an important topic.

Based on survey data of current students of the Faculty of Management and Economics, Ruhr-University Bochum, Germany, the effect of the political decision on the perception of financial uncertainty is analyzed. According to recent literature (e.g. Bloom 2009) uncertainty inhibits economic output. Hence, the political decision on banking supervision might have an impact on economic growth through the uncertainty channel. If a politically dependent banking supervision increases financial uncertainty, it would be - from an economic point of view - basically better to avoid poli-tical influence on banking supervision. In case of independence between uncertainty and political influ-ence, the decision of the German government could not be criticized by economic uncertainty reasons and the criticism about the decision would be relativized. Within the context of the survey, participants were asked to specify their expectations on the target variables of the New Keynesian model (i.e. key interest rate of the European Central Bank, German inflation rate, German output gap) during the next year, their perceived DAX uncertainty during the last year as a proxy for lagged financial uncertainty and the probability of a sovereign default in the Euro zone

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during the next year. These variables are used as exogenous variables to explain an unobservable construct, the "fundamental uncertainty", motivated by the so called implicit association test (IAT) of Greenwald, McGhee, and Schwartz (1998). Fundamental uncertainty in terms of the deviation between explicit and implicit uncertainty contains information on human behavior. Explicit variables have predictive power concerning controlled behavior, whereas implicit variables account for automatic behavior. The divergence between these factors can lead to unexpected behavior changes and supports financial instability.

This paper is organized as follows. Section 2 motivates the investigation and section 3 explains the survey variables and discusses the sample size and representativeness. The subsequent section 4 shows the empirical results. Section 5 concludes.

2. MOTIVATION

According to classical economics the modelling of mean equations of economic systems attracted much attention. Starting with the development of Autoregressive Conditional Heteroskedasticity (ARCH) models of Engle (1982) and the generalization by Bollerslev (1986) - at least in financial econometrics - a paradigm shift was observable. Due to the efficient market hypothesis the prediction of stock market returns seems to be impossible. Instead predicting conditional means the prediction of conditional variances (volatility) for pricing models became more important.

Consider the conventional ARCH(1) representation of the future stock market return x_{t+1} in order to motivate the following concept of fundamental uncertainty.

$$x_{t+1} = u_{t+1} \tag{1}$$

$$u_{t+1} = e_{t+1}\sigma_{t+1} \quad with\ E(e_{t+1}) = 0\ and\ V(e_{t+1}) > 0 \tag{2}$$

$$\sigma_{t+1}^2 = \beta_1 + \beta_2 x_t^2 \quad with\ \beta_1, \beta_2 > 0 \tag{3}$$

The explanation of future stock market variance σ_{t+1}^2 as a proxy for financial instability is a time series approach. As long as the variance equation contains no stochastic error, volatilities are deterministic and not stochastic. Hence, based on appropriate estimates $\hat{\beta}_1$ and $\hat{\beta}_2$ the rational expectation at date t for future stock market variability is computable as $\hat{\sigma}_{t+1}^2 = \hat{\beta}_1 + \hat{\beta}_2 x_t^2$. Consequently, $\hat{\sigma}_{t+1}$ is a substitute for $E_t(\sigma_{t+1})$, which is the conventional concept of stock market uncertainty. ARCH-family models became the workhorse of the industry because of volatility clusters

in real-world financial time series. Even if the conditional variance equation contains further exogenous regressors, the time series approach concentrates on aggregated market data. A behavioral explanation of stock market uncertainty $E_t(\sigma_{t+1})$ from an individual perspective is not intended by the ARCH approach. In order to understand the aggregated market data as an outcome of individual behavior, it is important to understand the underlying individual behavior. In this paper the individual explanation of stock market uncertainty in a behavioral approach will be called "fundamental uncertainty", and uses the behavioral theory of the implicit association test (IAT) of Greenwald, McGhee, and Schwartz (1998).

3. SURVEY VARIABLES AND SAMPLE

3.1. Fundamental uncertainty

The IAT methodology attracted much attention in scientific psychology. According to this approach the divergence between people's explicit and implicit attitude is analyzed. Higher divergence leads to the conclusion of less founded attitudes. This means that people do not really know their minds. If they would know their minds, explicit and implicit attitudes would be the same. Scientific psychology identifies explicit measures as proxies to predict controlled behavior. Contrary, implicit measures seem to be proxies with predictive power concerning automatic behavior. Especially during times of crises the interplay between controlled and automatic behavior seems to be very important. Interpreting the deviation from controlled behavior as the trigger of market anomalies, real world observations like e.g. herding effects (see e.g. Shiller 2000) show the relevance for real world economics.

Automatic (implicit) and controlled (explicit) mechanisms determine final behavior of market participants. If an explicit and implicit measure show the same value, there is no uncertainty about the resulting behavior. But if the explicit measure deviates from the implicit measure, there is uncertainty about the final behavior. This underlying behavioral uncertainty or "fundamental uncertainty" is an unobservable variable. The subsequent definition of fundamental uncertainty of person i at date t follows the IAT methodology and equals

$$E_{it}(\sigma_{t+1} \mid dependent) := \mid E_{it}(\sigma_{t+1} \mid dependent)_{explicit} - E_{it}(\sigma_{t+1} \mid dependent)_{implicit} \mid \tag{4}$$

and

$$E_{it}(\sigma_{t+1} \mid independent) := \mid E_{it}(\sigma_{t+1} \mid independent)_{explicit} - E_{it}(\sigma_{t+1} \mid independent)_{implicit} \mid . \tag{5}$$

Dependent on the fact of independent or dependent banking supervision, $E_{it}(\sigma_{t+1} \mid \bullet)$ is the individual behavioral counterpart of $\hat{\sigma}_{t+1}$ resulting from the conditional variance equation of (3). Based on the IAT theory fundamental uncertainty is therefore structurally explained by the two statistics $E_{it}(\sigma_{t+1} \mid \bullet)_{explicit}$ and $E_{it}(\sigma_{t+1} \mid \bullet)_{implicit}$. Hence, $E_{it}(\sigma_{t+1} \mid \bullet)$ can not be interpreted in a statistical sense as the standard deviation of a probability distribution. It is a theoretical construct resulting from psychology, which explains fundamental uncertainty from an individual behavioral perspective.

Due to the complex calculation - which is unknown to the survey participants - of the implicit uncertainty proxies (see subsection 3.3), it can not be expected that the participants are able to calculate the implicit values. Hence, it is reasonable to identify $E_{it}(\sigma_{t+1} \mid \bullet)$ as fundamental uncertainty in terms of the deviation of explicit and implicit values. It is not likely that the survey participants are able to pursue any strategic behavior in the course of the survey.

The survey design is a consequence of the hypothesis that monetary policy, economic policy and backward-looking behavior explain fundamental uncertainty. Monetary policy is conducted by the European Central Bank in cooperation with the National Banks. These politically independent institutions are responsible for the interest rate r and the inflation rate π. As long as the uncertainty concept deals with expected future values, explaining factors for $E_{it}(\sigma_{t+1} \mid \bullet)$ could be $E_{it}(r_{t+1})$ and $E_{it}(\pi_{t+1})$. On the other hand economic policy is conducted by the government and deals with economic output issues and currently predominately with the stabilization of the Euro. Hence, expected output gap $E_{it}(y_{t+1})$ and expected probability of a sovereign bankruptcy in the EURO area $E_{it}(euro_{t+1})$ imply the impact of economic policy on fundamental uncertainty. For more information about exogenous variables see subsection 3.4. Finally, lagged uncertainty $E_{it-1}(\sigma_t)$ considers the well known issue of backward-looking behavior in economics. The application of $E_{it-1}(\sigma_t)$ instead of $E_{it-1}(\sigma_t \mid \bullet)$ ensures that all regressors on the right hand side of equation (6) are unaffected by the issue of independent or dependent banking supervision. Hence, temporal dependence dependent on the architecture of the supervision is not analyzed. Variation of the endogenous variables $E_{it}(\sigma_{t+1} \mid independent)$ and $E_{it}(\sigma_{t+1} \mid dependent)$ is explained by the same set of regressors (ceteris paribus). Consequently, the initial structural model of fundamental uncertainty is:

$$E_{it}(\sigma_{t+1} \mid \bullet) = \overbrace{\alpha_1 E_{it}(euro_{t+1}) + \alpha_2 E_{it}(y_{t+1})}^{economic \;\; policy} + \overbrace{\alpha_3 E_{it-1}(\sigma_t)}^{backward-looking}$$
$$+ \underbrace{\alpha_4 E_{it}(r_{t+1}) + \alpha_5 E_{it}(\pi_{t+1})}_{monetary \;\; policy} + u_{it \mid \bullet} \qquad (6)$$

3.2. Explicit Uncertainty

Based on the exogenous variables the survey participants are asked to quantify their individual stock market uncertainty in case of politically dependent banking supervision, $E_{it}(\sigma_{t+1} \mid dependent)_{explicit}$, and in case of politically independent supervision, $E_{it}(\sigma_{t+1} \mid independent)_{explicit}$. These conditional expected values range on a discrete scale from 0 ("no uncertainty") to 5 ("very high uncertainty").

3.3. Implicit Uncertainty

In order to calculate implicit uncertainty values, the survey participants have to specify in a first step their expectations on the annual DAX return (in %) during the next year. The application of this variable becomes obvious, due to the conventional definition of uncertainty (see Bloom 2009) as in t expected standard deviation of the stock market return during t+1. As long as the future value of the annual DAX return x_{t+1}^* is at current date t unknown, X_{t+1}^* can be interpreted as a random variable. Although, the survey participants are not aware of x_{t+1}^* they can define individual expectations about it. These individual expectations are deterministic values and not realizations of any individual random variables. This leads to the conclusion, that the following calculations are a matter of descriptive statistics rather than probability theory. Based on the descriptive nature of individual expectations, implicit uncertainty is calculated by the standard deviation of the individual expected annual return.

In order to calculate the standard deviation of the individual expected annual return consider the following expected return categories $< -20\%$, $-20\% \leq \ldots < -15\%$, $-15\% \leq \ldots < -10\%$, $-10\% \leq \ldots < -5\%$, $-5\% \leq \ldots < -0\%$, 0%, $0\% \leq \ldots < 5\%$, $5\% \leq \ldots < 10\%$, $10\% \leq \ldots < 15\%$, $15\% \leq \ldots < 20\%$, $> 20\%$. In this subsection "n" represents the category number of expected annual DAX returns during the next year. Hence, $n = 11$ holds. Each survey participant must distribute 11 points over these n categories to express the individual likelihood of a specific category. The more weighting points are allocated to a specific category, the higher the survey participant expects the return falling into this specific category. Points assigned to category j, $j = 1, \ldots, n$, of person i, $i = 1, \ldots, m$, will be expressed by x_{ijt+1}. In the further course of the survey, the participants have to assign weighting points in case of politi-

cally dependent and independent banking supervision. Hence, it is possible to calculate the i-th expected weight of category j by

$$w^e_{ijt,dependent} = \frac{x_{ijt+1} \mid dependent}{n} \tag{7}$$

and

$$w^e_{ijt,independent} = \frac{x_{ijt+1} \mid independent}{n} \; . \tag{8}$$

Once the explicitly determined values for $w^e_{ijt,dependent}$ and $w^e_{ijt,independent}$ are available, implicit uncertainty values are computable in the spirit of weighted means and standard deviations according to

$$E_{it}(\sigma_{t+1} \mid dependent)_{implicit} = $$
$$\sqrt{\sum_{j=1}^{n} [x_{jt+1} - E_{it,dependent}(\mu_{t+1})]^2 \cdot w^e_{ijt,dependent}} \tag{9}$$

with

$$E_{it,dependent}(\mu_{t+1}) = \sum_{j=1}^{n} x_{jt+1} \cdot w^e_{ijt,dependent} \tag{10}$$

and

$$E_{it}(\sigma_{t+1} \mid independent)_{implicit} = $$
$$\sqrt{\sum_{j=1}^{n} [x_{jt+1} - E_{it,independent}(\mu_{t+1})]^2 \cdot w^e_{ijt,independent}} \tag{11}$$

with

$$E_{it,independent}(\mu_{t+1}) = \sum_{j=1}^{n} x_{jt+1} \cdot w^e_{ijt,independent} \; . \tag{12}$$

If person i allocates all 11 points on one category j, the resulting implicit uncertainty is low ($0 =$ no uncertainty). Then, i believes that category j will be observable for sure. On the other hand, if i assigns 5 points to the lowest and the remaining 6 points to the highest category the implicit uncertainty is very high ($4.98 \approx 5 =$ very high uncertainty). In case of uniformly distributed points over the entire domain, an intermediate implicit uncertainty is observable ($3.16 \approx 3 =$ intermediate uncertainty). Hence, compared with $E_{it}(\sigma_{t+1} \mid dependent)_{explicit}$ and $E_{it}(\sigma_{t+1} \mid independent)_{explicit}$, $E_{it}(\sigma_{t+1} \mid dependent)_{implicit}$ and $E_{it}(\sigma_{t+1} \mid independent)_{implicit}$ vary not on a discrete scale from 0 to 5. In fact, the implicit indicators vary approximately between 0 and 5 on a continuous scale.

3.4. Exogenous Variables

In contemporaneous macroeconomics the New Keynesian Model (see Galí 2008) is a widely accepted model and provides key indicators of the economy. These closely connected key indicators are interest rate r, inflation rate π and output gap y, which show interaction with financial uncertainty in terms of stock market uncertainty (see e.g. Jovanovic 2012). Usually (see e.g. Bloom 2009), financial uncertainty is defined as expected stock market variability $E_t(\sigma_{t+1})$, where σ_{t+1} stands for the standard deviation of the returns of a stock market index during the period $t+1$. In the German case this index is the Deutsche Aktienindex (DAX). Due to the concentration on expectations on future events, the survey participants i, $i = 1,...,n$, have to specify (expressed as a percentage) their current average expectations on r, π and y during the next year $t+1$, hence, $E_{it}(r_{t+1})$, $E_{it}(\pi_{t+1})$ and $E_{it}(y_{t+1})$. The fourth variable of the survey is the perceived probability (in %) of a sovereign bankruptcy in the EURO area in $t+1$ of person i, say $E_{it}(euro_{t+1})$. It is assumed that this variable strongly affects financial uncertainty. The argument for the last variable is justified by Roos and Schmidt (2012). They show in an experiment that backward-looking behavior can be identified unambiguously as a decisive factor in expectation formation. Therefore, lagged uncertainty $E_{it-1}(\sigma_t)$ on a discrete scale from 0 ("no uncertainty") to 5 ("very high uncertainty") has to be specified by the survey participants.

3.5. Survey Sample

This investigation uses survey data from students of the Faculty of Management and Economics, Ruhr-University Bochum, Germany. Consequently, the survey sample is not representative for the whole German society. But accepted real world proxies for stock market uncertainty like the VDAX in Germany or the VIX in the United States are mainly driven by stock market traders. The majority of the traders are educated in management and economics. Furthermore, Bloom (2009) shows the impact of stock market uncertainty on economic growth through investment decisions. These decisions are also mainly driven by economically educated decision-makers. This leads to the conclusion that economically educated persons represent the relevant population regarding stock market uncertainty. Hence, the sample is representative with respect to the criterion "economic education". But the representativeness is limited by the fact that current students are currently not in charge of the decision-making process of the economy. It is likely that current students will be decision-makers in the future. Therefore, the sample representativeness is rather future oriented.

The determination of the survey sample size is a basic issue of survey designs. Due to the fact that the object of this investigation is "uncertainty", the explicit uncertainty variable is used to derive the sample size. In the course of the survey the participants i, $i = 1,...,n$, specify $E_{it}(\sigma_{t+1} \mid dependent)_{explicit}$ and $E_{it}(\sigma_{t+1} \mid independent)_{explicit}$. The corresponding expected values over all survey participants are noted by $\mu_{explicit}^{dependent}$ and $\mu_{explicit}^{independent}$, respectively. In order to specify the sample size, the accuracy of the mean values as estimates of the expected values should be high. To be precise, the confidence interval length on the 95% confidence level (accuracy proxy) is defined as 4% of the available uncertainty levels of the survey. Hence, the desired interval length is $0.04 \cdot 5 = 0.2$. Figure **1** shows the estimated confidence interval lengths of the expected values dependent on survey data.
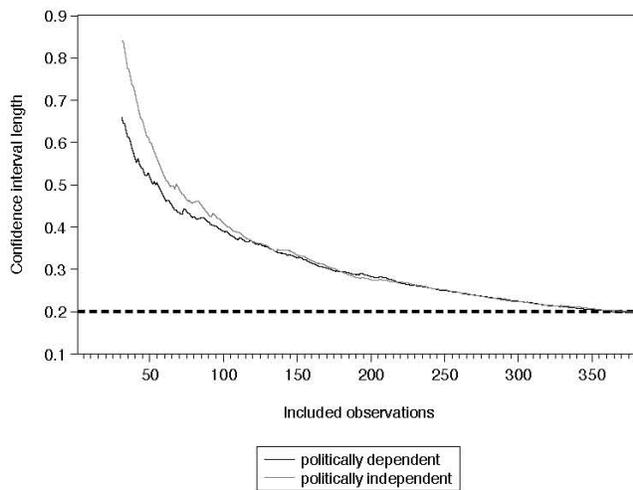

Figure 1: 95 percent interval length of explicit expected uncertainty.

For 382 included observations the confidence interval length of $\mu_{explicit}^{dependent}$ is 0.195443 and the interval length of $\mu_{explicit}^{independent}$ is 0.197438. Therefore, the initial sample size (without outlier adjustment) of the survey is $n = 382$.

4. EMPIRICAL RESULTS

Conventional time series analysis identifies samples, which seem to be representative for the whole time domain. In order to avoid large biases of OLS regression estimates caused by outliers the representative sample will be outlier adjusted. This paper follows the approach applied in regression models and removes outliers from the sample to avoid OLS bias effects. In addition to the technical aspect of the outlier adjustment, objective reasons call for outlier removal. For example, one survey participant set an expected interest rate of -13%, which is far away from the average rate of the adjusted sample (1.78%) and bares a lack of economic content. These survey numbers are rather connected to erroneous data than serious expectations.

The identification of outliers is carried out by the conventional approach of Davidson and MacKinnon (1993). For $n = 382$ survey participants the $(n \times K)$ matrix X of the K exogenous variables $E_{it}(r_{t+1})$, $E_{it}(\pi_{t+1})$, $E_{it}(y_{t+1})$, $E_{it}(euro_{t+1})$ and $E_{it-1}(\sigma_t)$ leads to the hat-matrix $P = X(X'X)^{-1}X'$. h_i, $i = 1,...,n$, is the i-th diagonal element of P and measures the potential impact of the i-th observation on OLS regression coefficients. Too large values for h_i indicate outliers, whereas 2K/n is commonly used as an appropriate threshold. Calculating and adjusting the survey sample leads to the identification of 24 unusual survey participants. Hence, the outlier adjusted sample size is $n = 358$. The raw data and the adjusted data of "problematic" observations are illustrated in Figure **2**. Due to the fact that the variability of $E_{it}(euro_{t+1})$ and $E_{it-1}(\sigma_t)$ is restricted (probability between 0 and 1, and uncertainty categories between 0 and 6), these variables are not included in Figure **2**.

Neglecting the outliers leads to descriptive statistics illustrated in Table **1**.

The descriptive results leads to the conclusion of economically educated survey participants. For example, expected inflation of 2.51% can be

Table 1:   Descriptive Statistics of the Exogenous Survey Variables

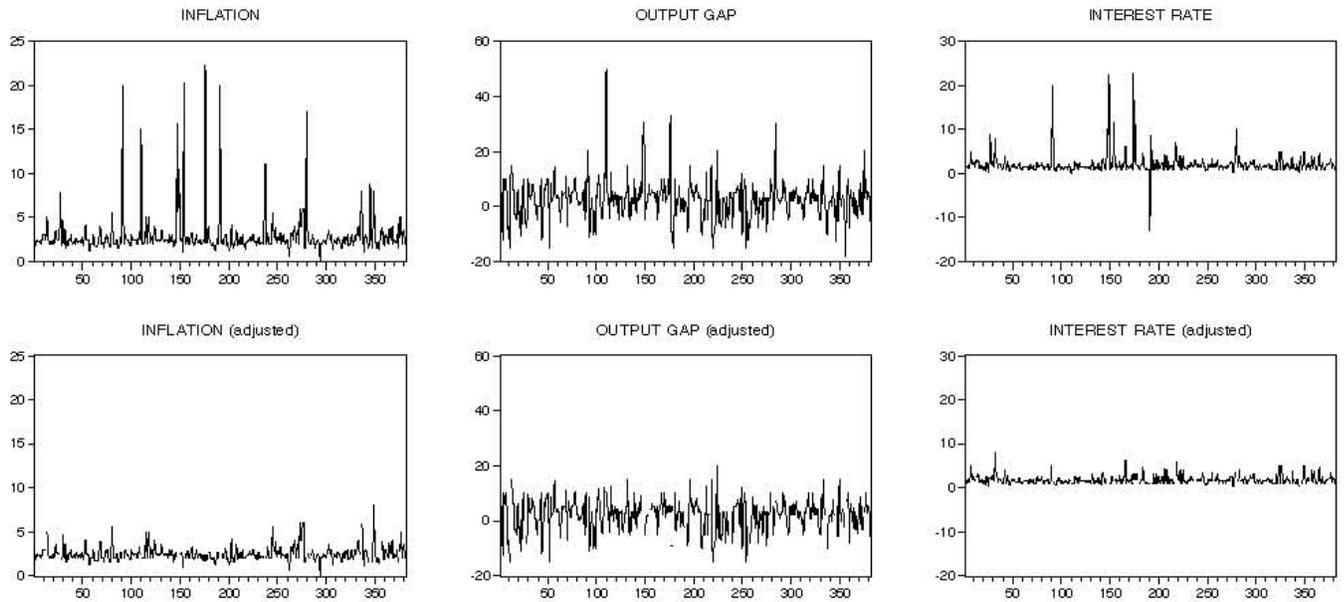|	$E_{it}(\pi_{t+1})$	$E_{it}(euro_{t+1})$	$E_{it}(y_{t+1})$	$E_{it}(r_{t+1})$	$E_{it-1}(\sigma_t)$
mean	2.51	32.98	1.91	1.78	2.96
std. deviation	0.85	24.79	5.88	0.99	0.95
maximum	8.00	100.00	20.00	8.00	5.00
minimum	0.10	0.00	-15.00	0.20	0.00
observations	358	358	358	358	358

Figure 2: Raw data and outlier adjusted data on $E_{it}(\pi_{t+1})$, $E_{it}(y_{t+1})$ and $E_{it}(r_{t+1})$.

interpreted as actual inflation plus a reasonable surcharge. According to data of the Statistisches Bundesamt (2012) the average annual change of the consumer price index for Germany between January and May 2012 is $\sqrt[5]{2.1 \cdot 2.3 \cdot 2.1 \cdot 2.1 \cdot 1.9} = 2.1\%$.

Table **2** shows the descriptive statistics of the explicit and implicit uncertainty variables.

With respect to the explicit variables, 164 persons associate with independent banking supervision lower financial uncertainty, 109 persons associate with independent supervision higher uncertainty and 85 persons are indifferent. These controversial sample clusters represent a reason for the real world discussion about dependent or independent banking supervision. One large group supports dependent supervision due to the association of lower financial uncertainty and another large group supports independent supervision due to the association of lower uncertainty. Hence, a controversial discussion

arises. On average $E_{it}(\sigma_{t+1} \mid dependent)_{explicit}$ and $E_{it}(\sigma_{t+1} \mid independent)_{explicit}$ are quite similar (2.85% versus 2.63%). Although, the expected values are statistically different for a one sided paired sample test (p-value = 0.0004), the difference of 0.22 out of 5 uncertainty categories is economically unimportant. In comparison to the explicit variables the implicit expected values are not even statistically different (p-value = 0.1922). Based on descriptive statistics of Table **2** and the related clustering it is reasonable to say that the survey sample matches quite well the stylized facts of the real world.

Considering the link between financial uncertainty and economic growth (see e.g. Bloom 2009), the survey results suggest that politically dependent banking supervision does not affect economic growth negatively. Consequently, it is untenable to associate higher financial uncertainty of economic agents with dependent banking supervision. In that sense,

Table 2: Descriptive Statistics of the Uncertainty Variables

	dep ∩ ex	indep ∩ ex	dep ∩ im	indep ∩ im
mean	2.85	2.63	1.52	1.49
std. deviation	0.98	0.99	0.91	0.93
maximum	5.00	5.00	4.98	4.98
minimum	0.00	0.00	0.00	0.00
observations	358	358	358	358

Notation: dep ∩ ex = $E_{it}(\sigma_{t+1} \mid dependent)_{explicit}$, indep ∩ ex = $E_{it}(\sigma_{t+1} \mid independent)_{explicit}$ and dep ∩ im = $E_{it}(\sigma_{t+1} \mid dependent)_{implicit}$, indep ∩ im = $E_{it}(\sigma_{t+1} \mid independent)_{implicit}$

independent supervision seems not to stabilize the financial market through the behavioral channel.

Like the explicit uncertainty variables, fundamental uncertainty in the introduced sense of not knowing the own mind shows only little economically interpretable response to the issue of dependent/independent banking supervision (see Table **3**).

Table 3: Descriptive Statistics of Fundamental Uncertainty Variables

	$E_{it}(\sigma_{t+1} \mid dependent)$	$E_{it}(\sigma_{t+1} \mid independent)$
mean	1.53	1.42
std. deviation	0.98	0.94
maximum	4.50	5.00
minimum	0.00	0.01
observations	358	358

Regarding the magnitude of the political effect on fundamental uncertainty it is empirically justified to expect only small differences caused by the supervisory structure.

4.1. Models of Fundamental Uncertainty

In order to generate comparable variabilities and means of the survey variables, the outlier adjusted variables are normalized. The normalization leads to sample means of 0 and sample variances of 1. Hence,

In the first step the initial structural model of fundamental uncertainty (see equation (6)) is estimated *via* OLS for the dependent and independent case of banking supervision. To detect the potential problem of multicollinearity in regression models the conventional coefficient variance decomposition of Belsley, Kuh, and Welsch (2004) is applied in Tables **4** and **5**.

The top line of the tables show the eigenvalues, sorted from largest to smallest, with the condition numbers below. All of the eigenvalues have condition numbers larger than 0.39. The absence of small condition numbers (say smaller than 0.01) indicate a small amount of collinearity. The second section of the tables display the decomposition proportions. The proportions associated with the smallest condition number are located in the first column. None of these values are close to 1. This indicates that there is a low level of collinearity between the variables. Finally, the multicollinearity analysis leads to the rejection of the multicollinearity hypothesis.[1]

In the second step insignificant variables are neglected successively from the initial structural model. The resulting models are

$$E_{it}(\sigma_{t+1} \mid dependent) = \alpha_1 E_{it}(euro_{t+1}) + \alpha_2 E_{it}(y_{t+1})$$
$$+ \alpha_3 E_{it-1}(\sigma_t) + u_{it \mid dependent} \qquad (13)$$

and

$$E_{it}(\sigma_{t+1} \mid independent) = \alpha_3 E_{it-1}(\sigma_t) + u_{it \mid independent} \quad . \quad (14)$$

Table 4: Multicollinearity Analysis of the Initial Model (Independent)

Eigenvalues	0.005	0.003	0.003	0.002	0.002
Condition	0.406	0.585	0.765	0.809	1.000
Variance Decomposition Proportions					
Associated Eigenvalue					
Variable	1	2	3	4	5
$E_{it}(euro_{t+1})$	0.521	0.264	0.012	0.195	0.008
$E_{it}(y_{t+1})$	0.000	0.193	0.526	0.231	0.049
$E_{it-1}(\sigma_t)$	0.603	0.148	0.014	0.029	0.206
$E_{it}(r_{t+1})$	0.324	0.081	0.010	0.172	0.413
$E_{it}(\pi_{t+1})$	0.004	0.416	0.380	0.200	0.000

large variabilities of $E_{it}(euro_{t+1})$ and $E_{it}(y_{t+1})$ are not anymore a potential problem for further regressions. To avoid a burdensome notation the introduced notation is valid for the standardized variables.

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[1] From a theoretical point of view it is unlikely that the cross section data series contain stochastic trends. However, unit root tests are conducted, which strongly reject the hypothesis of integrated data series. Therefore, the residuals of the followings regressions can not contain any stochastic trends.

Table 5:   Multicollinearity Analysis of the Initial Model (Dependent)

Eigenvalues	0.005	0.004	0.003	0.002	0.002
Condition	0.394	0.497	0.713	0.857	1.000
Variance Decomposition Proportions					
Associated Eigenvalue					
Variable	1	2	3	4	5
$E_{it}(euro_{t+1})$	0.037	0.502	0.014	0.366	0.082
$E_{it}(y_{t+1})$	0.198	0.001	0.477	0.022	0.302
$E_{it-1}(\sigma_t)$	0.212	0.264	0.211	0.009	0.304
$E_{it}(r_{t+1})$	0.432	0.219	0.212	0.126	0.011
$E_{it}(\pi_{t+1})$	0.567	0.238	0.020	0.175	0.000

Table 6:   Reaction Functions of Fundamental Uncertainty

	α_1	α_2	α_3	**Adj. R^2**
(a) *Dependent banking supervision*	0.089*	-0.108**	0.212**	0.07
	(0.051)	(0.049)	(0.050)	
(b) *Independent banking supervision*	-	-	0.290**	0.08
	-	-	(0.054)	

OLS estimation. - Observations = 358 - White heteroskedasticity-consistent standard errors in parenthesis. - ** and * indicate the rejection of the hypothesis of zero coefficients on the 95% and 90% level. - Absence of serial correlation up to lag 2 on the 95% level (Breusch/Godfrey test).

Table **6** shows the appropriate estimation results.

First of all it is very interesting to see that monetary policy (i.e. $E_{it}(r_{t+1})$ and $E_{it}(\pi_{t+1})$) is not able to influence fundamental uncertainty. The survey participants apparently expect that the European Central Bank is very well in the position to control the interest rate and inflation rate. Consequently, it is empirically evident that the ECB enjoys a superb reputation. Hence, this institution seems not to be a source of fundamental uncertainty.

In case of independent banking supervision conducted by the Bundesbank, the survey participants expect that this institution will continue the institutional feature of independence. Political influence on regulatory actions of the Bundesbank is not expected. Therefore, it is plausible that the coefficients connected to political variables (i.e. α_1 and α_2) are insignificant. Only the well known issue of backward-looking behavior is statistically evident. In case of dependent banking supervision conducted by the Bundesbank and finally by the politically dependent BaFin, it is empirically evident that political actions significantly affect fundamental uncertainty. Higher expected probability of a sovereign bankruptcy leads to higher

fundamental uncertainty and an expected higher output gap leads to lower financial uncertainty.

Both regressions show a low adjusted R^2. In general, cross sectional regression fits are lower than the counterparts in time series analysis. Furthermore, the calculated fundamental uncertainties are based on individual expectations of the survey participants, which are not aware of the calculation rule. This leads to lower fits of the regressions. Finally, the scope of this paper is the identification of significant variables, hence, parameter-oriented.

5. CONCLUSIONS

According to the sample representativeness discussion of subsection 3.5, the sample seems to be appropriate to derive some general indications. However, the following conclusions are only transferable to a limited extent to the German economy due to the nature of a feasible survey design.

Summing up the empirical findings of this paper it is evident that the issue of dependent or independent banking supervision has only little impact on the level of explicit and implicit financial uncertainty of the survey

participants. Hence, the decision of the coalition parties CDU, CSU and FDP to implement a politically dependent banking supervision in Germany seems not to have a destabilizing effect through the behavioral channel.

The introduced unobservable construct "fundamental uncertainty" shows sensitivity towards the design of banking supervision. In case of dependent supervision economic policy is able to influence fundamental uncertainty through the behavioral channel. "good" policy decreases fundamental uncertainty and "bad" policy increases fundamental uncertainty. In case of independent supervision economic policy is not able to influence fundamental uncertainty through the behavioral channel. Therefore, the basic question wether banking supervision should be independent or not is upon the judgement of the German political system. If we believe that the political system is able to stabilize the financial system, we should introduce a dependent banking supervision. Then, appropriate political actions will reduce fundamental uncertainty due to the verified behavioral channel. If we believe that the political system is not able to stabilize the financial system, we should introduce a politically independent banking supervision. But in that case it is not possible to influence fundamental uncertainty systematically by the behavioral channel.

Finally, the findings of this paper lead to the conclusion that the decision of politically dependent banking supervision in Germany of the German government in the year 2010 did not affect financial stability expectations of economic decision-makers in Germany. Hence, negative growth effects are not empirically evident. Assuming a stable German political system - which is able to stabilize the financial market by its actions - supports political influence on German banking supervision. As long as taxpayers' money is used to stabilize the banking system, it seems to be justified that taxpayers are able to influence the usage of tax revenues *via* democratically legitimized representatives. Hence, the empirical implication of the survey seems to be plausible in the light of the aforementioned argumentation.

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REFERENCES

[1]   Belsley, David A., Edwin Kuh, and Roy E. Welsch. 2004. Regression Diagnostics: Identifying Influential Data and Sources of Collinearity. New York: Wiley.

[2]   Bloom, Nicholas. 2009. "The Impact of Uncertainty Shocks." Econometrica 77(3):623-85.
http://dx.doi.org/10.3982/ECTA6248

[3]   Bollerslev, Tim. 1986. "Generalized Autoregressive Conditional Heteroskedasticity" Journal of Econometrics 31(3):307-27.
http://dx.doi.org/10.1016/0304-4076(86)90063-1

[4]   Davidson, Russell and James G. MacKinnon. 1993. Estimation and Inference in Econometrics. New York: Oxford University Press.

[5]   Engle, Robert F. 1982. "Autoregressive Conditional Heteroskedasticity with Estimates of the Variance of U.K. Inflation." Econometrica 50(4):987-1008.
http://dx.doi.org/10.2307/1912773

[6]   Galí, Jordi. 2008. Monetary Policy, Inflation and the Business Cycle. New Jersey: Princeton University Press.

[7]   Greenwald, Anthony G., Debbie E. McGhee, and Jordan L. K. Schwartz. 1998. "Measuring Individual Differences in Implicit Cognition: The Implicit Association Test." Journal of Personality and Social Psychology 74:1464-80.
http://dx.doi.org/10.1037/0022-3514.74.6.1464

[8]   Jovanovic, Mario. 2012. "Empirical Evidence on the Generalized Taylor Principle." Economics Letters 117(1):78-80.
http://dx.doi.org/10.1016/j.econlet.2012.04.088

[9]   Ministry of Justice. 2012. Gesetz über das Kreditwesen. Retrieved December 5, 2012 (http://www.gesetze-im-internet.de/kredwg).

[10] Roos, Michael W. M. and Ulrich Schmidt. 2012. "The Importance of Time-Series Extrapolation for Macroeconomic Expectations." German Economic Review 13(2):196-210.
http://dx.doi.org/10.1111/j.1468-0475.2011.00551.x

[11] Statistisches Bundesamt. 2012. Retrieved December 11, 2012 (https://www.destatis.de/DE/ZahlenFakten/Indikatoren/Konjunkturindikatoren/Preise/kpre510.html.

[12] Shiller, Robert. 2000. Irrational Exuberance. New York: Princeton University Press.