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The political economy of finance and regulatory capture: Evidence from the US Congress

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The political economy of finance and regulatory capture: Evidence from the US Congress*

Filippo Silano‡

Abstract

The 2007-08 Global Financial Crisis is a watershed phenomenon that reshaped global capitalism. Stemming from the argument that the Crisis was caused by deregulation, this article assesses to what extent the financial industry influenced the legislative process underlying these reforms. The hypothesis is that, during the deregulation process, the financial industry captured lawmakers' voting behaviour. Drawing on a logistic regression model, this study estimates to what extent 106th –109th Congress roll call votes on financial liberalisation were biased by industry-led campaign contributions and lobbying activities. The main finding shows that members of the US Congress recipient of funding from the financial sector were more prone to support deregulation. Providing systematic empirical evidence of capture, the results support the literature labelling the Crisis as the result of industry-induced deregulation.

Key words: political economy, financial crisis, deregulation, capture, campaign finance, lobbying, US Congress, voting behaviour, logistic regression

JEL Codes: G01, G18, K22, K23, P16

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1. Introduction

Upon the 1929 Wall Street crash, the US Congress approved regulatory measures preventing the occurrence of another financial meltdown (Sherman 2009; Stiglitz 2010). The three paramount pieces of legislation were the 'Glass-Steagall Act of 1933', the 'Securities Act of 1933', and the 'Securities Exchange Act of 1934'. The first divided commercial from investment banks, compelling them to choose between storing customer deposits or engaging in speculative activities (Mazzucato 2018). The other two's objective was to promote securities' market transparency, and to avoid Ponzi schemes through the enactment of tighter fraud and bankruptcy laws (Sherman 2009).

During the 106th–109th Congress (1999-2007) were approved bills amending or repealing the above-outlined measures and other laws promoting financial innovation, expansion, and integration (Crotty 2009). These policies advocated securitization of mortgages, housing market growth (i.e. relaxation of lenders creditworthiness requirements), and the transformation of banking activity's nature and structure (i.e. encouraging mergers and acquisitions).

It is a widely-diffused assumption among scholars and policy makers identifying this wave of deregulation as the main mechanism underlying the Crisis (Crotty 2009; P. Krugman 2009; Stiglitz 2010). Indeed, this laissez-faire model sustained the rapid mortgage market growth and the bubble's occurrence through favourable pieces of legislation driving financial innovation and securitisation.

This article investigates the causes of the Crisis adopting a political economy approach. In order to accomplish this goal, the analysis assesses the determinants, which drove the approval of deregulatory legislation in the US House of Representatives, throughout 1999-2007 (106th–109th Congress). The hypothesis is that legislators were object of regulatory capture exerted by the financial sector in form of individual campaign contributions and lobbying activity. A phenomenon biasing regulatory authorities policy cycle in favour of the industry (Peltzman 1976; Stigler 1971).

The underlying assumption is that such government failure was triggered by lawmakers' re-election horizons, constrained to incumbent constituencies' preferences

and interest groups' pressure (Persson and Tabellini 2002). Following Peltzman (1984), financial industry's congressional campaign contributions constitute the proxy for capture.

The realisation of this hypothesis would explain why, notwithstanding the rapid increase in US housing prices and related complex financial instruments' market, which unfolded in the late 1990s (Crotty 2009; Shiller 2005), politicians and regulators did little in response (D. Baker 2008; P. R. Krugman 2009; Levine 2012; Mccarty et al. 2010; Stiglitz 2010). Indeed, according to financial economics theory (Keynes 2018; Minsky 1999), the deviation in housing market's trends should had been a warning signal for systemic instability.

Anecdotal and empirical evidence support this study's hypothesis. Financial, real estate, and insurance sector represent the sectors with largest mobilisation power in terms of lobbying activity as well as campaign donations (Kroszner and Strahan 1999, 25), which nearly tripled in the period 1992-2008 (Mccarty et al. 2010, 64).

Empirically testing the capture hypothesis, a general linear logit model measures the probability that a Congress member voted 'yes' on the voting sessions of interest, controlling for an index of legislator's ideology (Poole and Rosenthal 1985; Nokken and Poole 2004), the logarithmic scale of campaign contributions (Bonica 2016), and the presence of lobbying activities. The results show that an increase in individual campaign contributions increases the likelihood of approval of a deregulatory measure.

The remainder of this article is the following. Section 2 provides a brief overview of the origins of the Crisis drawing on a political economy narrative. Then, Section 3 describes the data and the empirical strategy. Hence, Section 4 presents the results and the conclusion outlines the policy implications and sketches avenues for future research.

2. The political economy of the Crisis

The current financial system is the outcome of transnational policies (Harvey 2007a), and of the Federal Reserve monetarist practices (1979-82) establishing the US dollar as the international currency of denomination (Minsky and others 1986). Upon

the disruption of the Bretton Woods system, in 1971, were introduced floating exchange rates. Such a structural change led to the formation of a new global economy characterised by a constant expansion of unregulated capital (Chomsky 2011; Stiglitz 2000).

This tendency would have been lately defined as being part of neoliberalism (Harvey 2007a; 2007b). A socioeconomic approach to public policy endorsing, among others, a finance-led growth (Oren and Blyth 2019). This process advanced a gradual integration of the economy, which culminated in the 'Washington Consensus', a policy framework coordinated by the International Monetary Fund, the World Bank, and the World Trade Organization. These institutions constitute the harmonizing element of the 'New Financial Architecture' (NFA), a system characterised by integration (Allen and Babus 2008), innovation (Minsky and others 1986), and deregulation (Crotty 2009; Sherman 2009; Stiglitz 2000).

The financialization of economic growth consists in the securitization of illiquid assets (Oren and Blyth 2019), a feature that prior the Crisis was embodied by mortgage-backed securities (MBSs),¹ credit default swaps (CDSs),² and collateralized debt obligations (CDOs)³ (Helleiner 2011). The transaction of these highly liquid assets issued on US mortgages increased dramatically from the late 1990s. The loans market reached \$3.6 trillion in 2006 (Keys et al. 2010), and by the end of 2008 the exchange of over-the-counter (OTC) derivatives was worth \$54.4 trillion (Crotty 2009).

These exchange volumes were triggered by the short-term incentives to engage in hazardous behaviour granted to managers and traders (Crotty 2009; Levine 2012), which extensively contributed in creating fictitious speculative profits (D. Baker 2008). Moreover, policies introducing soft-budget constraints for banks, like the bailout of systemically important institutions, had the perverse effect of encouraging moral hazard practices leading to idiosyncratic market features (Crotty 2009).

¹ "An MBS is a security backed by a mortgage pool, which is a group of mortgages characterized by similar contract terms." (F. F. Dictionary 2012).

² The CDS is a complex financial instrument, which was first issued in the late 1990s (Morgan 2008). It allows to hedge and trade credit risk and it is bound to a loan instrument such as a mortgage-backed security (F. F. Dictionary 2012).

³ "An asset-backed security backed by the receivables on loans, bonds or other debt." (F. F. Dictionary 2012).

Therefore, the different nature of this Crisis has to do with the central role played by financial markets (Romer 2011), whose collapse caused a wave of bank runs, a liquidity trap, the disruption of international capital flows, and a wave of currency crises (P. Krugman 2009).

This dramatic outcome was supported by an industry-promoted deregulation, which by the end of the 1990s saw regulators acting against the public interest (A. Baker 2010; Bertrand, Bombardini, and Trebbi 2014; McCarty and Meirowitz 2007). The financial sector successfully lobbied the Congress to expand the US mortgage lending market (Igan, Mishra, and Tressel 2012; Mian, Sufi, and Trebbi 2010), and to delay the implementation of two anti-crisis measures, namely the American Housing Rescue and Foreclosure Prevention Act (AHRFPA) and the Emergency Economic Stabilization Act (EESA) (Mian, Sufi, and Trebbi 2010). This study embeds in systematic empirical evidence the work by Igan, Mishra, and Tressel (2012) by showing how the financial industry managed to successfully influence the wave of deregulation triggering the Crisis.

3. Data and empirical strategy

3.1 Roll call votes and legislator's ideology

The roll call votes of the bills promoting deregulation were collected by querying the *Voteview* database with a list of the issues of interest (Lewis Jeffrey BPoole et al. 2018).⁴ The total number of bills is 24, all of which were approved by bipartisan majorities – for more details see Appendix A.

Operatively, the selection of the roll calls of interest is preparatory to the construction of a roll call object. A mathematical element associating the voting session to the House member legislative behaviour (yea or nay). Analytically, it consists of a n by m matrix $Y = \{y_{ij}\}$, indicating whether legislator i = 1, ..., n votes yea ($y_{ij} = 1$), nay ($y_{ij} = 0$) or abstains on proposal j = 1, ..., m (Clinton, Jackman, and Rivers 2004).

⁴ The following expressions were submitted as queries: 'financial deregulation', 'derivatives and securities', 'accounting and financial statements', 'auditing', 'securities regulation', 'securities fraud', 'real estate business', 'securities industry', 'mortgage loans', 'Securities and Exchange Commission', 'secondary mortgage market', 'Commodity Futures Trading Commission' and 'independent regulatory commissions'.

The analysis gathers 43 voting sessions,⁵ forming a data set of 18,287 observations that, upon removing the 700 abstentions, decreases to 17,587.⁶

The House member ideology index NOMINATE is an algorithm estimating the legislators' ideal point, which represents their ideological preferences on a two-dimensional map (Boche et al. 2018).

The domain of the function NOMINATE belongs to the set of real numbers in the interval $\{-1, +1\}$, where -1 corresponds to extreme left-wing, and +1 to radical right-wing.

3.2 Campaign contributions

Data on campaign contributions was retrieved from the "Database on Ideology, Money in Politics and Elections" (DIME) developed and maintained by Bonica (2016). It is the most comprehensive data set about US electoral contributions as it contains over 130 million transactions made by individuals and organisations to local, state, federal elections spanning a period from 1979 to 2014 (Bonica 2016). Significantly, DIME provides every listed transaction associated to a specific candidate for an election.

The database was queried in accordance to the electoral cycles of interest (see Table 1), the type of elections (Federal), and the donor of interest (the financial industry). The sources of campaign finance are Political Actions Committees (PACs)⁷, individuals, and Chief Executive Officers (CEOs).

Table 1. Campaign finance deployed by the financial industry per Federal election

Electoral cycle	Amount
1998 (106th Congress)	\$20,193,812
2000 (107th Congress)	\$35,472417
2002 (108th Congress)	\$24,419,179
2004 (109th Congress)	\$35,769,551
Σ	\$115,854,959

Source: Author's own analysis of Bonica (2016)

⁶ According to studies on the statistical analysis of roll call voting, abstentions shall be removed from the dataset (Bonica 2018; Clinton, Jackman, and Rivers 2004, 7).

⁵ For more details, see Appendix A.

⁷ The main channel for firms seeking to influence political activity (Bonica 2016).

Table 1 and 2 provide summary statistics of the amounts deployed throughout the electoral cycles of interest. These values do not include financial resources directed to non-elected candidates.

Table 2. Table contributors (1998-2004) by private entity

Corporation	Amount
Goldman Sachs	\$8,495,556
Bank of America	\$7,366,427
Citigroup	\$4,170,602
Ernst & Young	\$3,998,117
Merril Lynch	\$2,891,058
Deloitte & Touche	\$2,509,974
Wells Fargo	\$1,068,673
Berkshire Hathaway	\$914,763
Blackrock	\$628,594
JP Morgan	\$443,150
Σ	\$28,898,352

Source: Author's own analysis of Bonica (2016)

After this preliminary data extraction, the analysis associates to each House of Representative member the amount received in support of each electoral run. During the 106th–109th Congress there were 573 unique legislators, and only 37 of them did not receive any contribution from the financial sector. Therefore, approximately 93% of Congressional members supported their electoral campaign drawing on the financial industry.

Table 3. Summary statistics, campaign contributions to members of Congress

Min.	1st Quartile	Median	Mean	3 rd Quartile	Max.
\$100	\$7000	\$11,500	\$14,928	\$17,000	\$980,648

Source: Author's own analysis of (Bonica 2016)

Table 3 presents summary statistics on resources received by members of the House of Representatives. Throughout the period of interest (1998-2004), the financial sector deployed on average \$14,928 to each individual per electoral cycle. A legislator received \$980,648, in support of one electoral campaign. The 1st quartile is the median

of the lower half of the data set, and it informs that 75% of legislators was recipient of more than \$7000 in each electoral cycle.

3.3 Lobbying activity

The Center for Responsive Politics provides data on lobbying activity, grouped by economic sector (Makinson 1992). The data does not allow to relate every single amount of lobbying effort to each legislator. On the other hand, it informs whether a law was object of influence by a specific industrial sector. Therefore, the impact of lobbying on deregulation will be operationalised through a dummy variable evaluating whether a bill was object of financial sector's pressure. The preliminary finding is that 26 out of 31 bills and related amendments objects of analysis were lobbied.

Table 4. Lobbying effort by issue (1999-2006)

\$1,293,593,728.00 \$1,139,043,865.00 \$424,719,102.00
\$1,293,593,728.00
. , , ,
. , , ,
\$1,810,983,805.00
\$2,215,288,400.00
\$2,560,035,499.00
Amount

Source: Author's own analysis of (Bonica 2016)

The summary statistics (see Table 4) inform that, among the policy issues of interest, 'Finance' was lobbied mobilising most resources. Significantly, as reported by Table 5, the firms that deployed the majority of resources are the government sponsored enterprises (GSEs) Fannie Mae and Freddie Mac, which represented the most powerful mortgage securitizers laying the ground for the Crisis (Simkovic 2011).

Table 5. Lobbying effort by corporation (1999-2006)

Client Name	Amount
Freddie Mac	\$143,213,248.00
Fannie Mae	\$127,938,000.00
Securities Industries Assn	\$62,395,985.00
Citigroup Management Corp.	\$61,430,000.00
American Insurance Assn	\$54,902,022.00
Investment Co. Institute	\$50,982,475.00
JPMorgan Chase & Co.	\$44,432,221.00
American Bankers Assn	\$43,415,358.00
Merrill Lynch	\$42,472,760.00
Accenture	\$33,760,009.00
Goldman Sachs	\$13,795,250.00
Tot.	\$678,737,328

3.4 Scatter plots and correlations

As illustrated in Figure 1 the three variables of interest: campaign contributions (*Intot*), lobbying (*Ib*), and ideology (*dim1*) are significantly⁸ and positively affecting the binary variable 'voting yea'. The diagonal shows the distribution taken by each variable, where *voteYes* and *Ib* are expressed by the peculiar graph of a dummy variable. On the other hand, *Intot* and *dim1* are continuous. The triangle at the bottom left side illustrates the scatter plots depicting the linear relationship between two variables.

⁸ This is conveyed by the three stars in the Wald test's results.

8

voteYes 9.0 0.29 0.13 0.13 9.4 0.2 Intot 0.032 0.16 ₽ 8.0 9.0 9.4 0.2 0.0 dim1 0.5 8 92 0.2 0.8 0.4 0.6 0.8 0.6

Figure 1. Scatter plots and correlation matrix

Nevertheless, such a graphical device is not informative to capture the correlation between a continuous and a binary variable. Overcoming this limit, an alternative data visualisation is the Lowess curve, which conveys how the probability of voting 'yes' is affected by a specific independent variable. Figure 2 is the smoothed scatter plot of the relationship between voting 'yes' and dimension 1 (*dim1*) of legislator's ideology. The probability of voting 'yes' increases in the value of dimension 1. Hence, it is more likely that a member of Congress who holds conservative views will support deregulation.

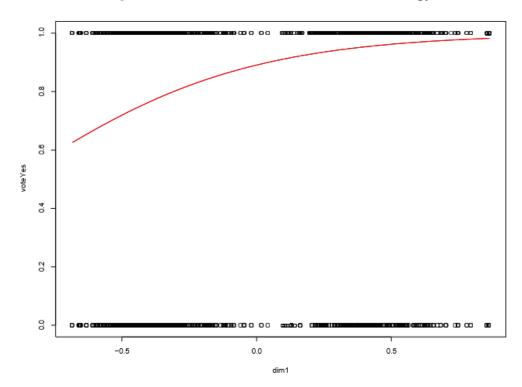


Figure 2. Lowess curve of *VoteYes* vs. Ideology

Figure 3 shows the relationship between the logarithmic scale of campaign contributions (*Intot*) and the probability of voting 'yes'. This visualisation fits the data to evaluate the probability of voting 'yes', accounting for the amount of contributions deployed by financial sector. As suggested by the graph, a rise in campaign finance led to a monotonous increase in the probability of voting 'yes'.

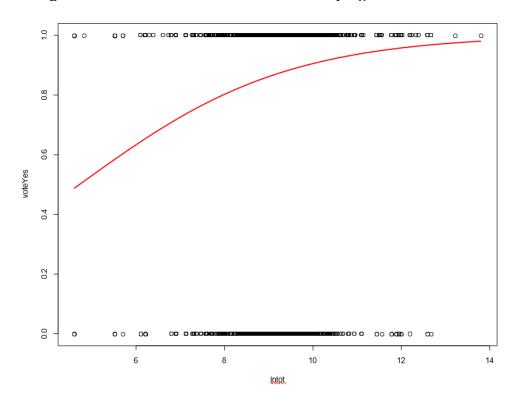


Figure 3. Lowess curve of *VoteYes* vs. Campaign contributions

Figure 4 illustrates the relationship between a legislator's ideological preference and her party affiliation, which is expressed by a dummy variable taking value 1 for Republican, and 0 for Democratic. The figure 0.94 is evidence of high pair-wise correlation between the two variables. Given the coefficient' magnitude and significance, the presence of both variables in the logit specification would lead to multicollinearity. Hence, the analysis includes in the model only the estimation of ideological orientation, given its robustness in explaining legislative voting behaviour (Poole and Rosenthal 1985).

dim1 ***

O.94

republican

Figure 4. Lowess curve of VoteYes vs. Campaign contributions

3.5 The model

The logit function of a multiple logistic regression model with p independent variables is denoted by the following equation (Gortmaker, Hosmer, and Lemeshow 1994):

$$g(x) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_p x_p \tag{1}$$

Alternatively,

$$\pi(x) = \frac{e^{g(x)}}{1 + e^{g(x)}} \tag{2}$$

The dependent variable is voting 'yea', and the independent ones are the NOMINATE dimension 1 of political ideology (dim1), the logarithmic scale of campaign finance (lnV1), and a dummy variable identifying the presence of lobbying activity (lb). Thus, the logit specification takes the following form:

$$P(Y = 1 \mid x) = G(\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3)$$
(3)

Or more intuitively:

$$VoteYes_{ij} = \beta_0 + \beta_1 dim1_i + \beta_2 lnV1_i + \beta_3 lb_i \tag{4}$$

Specification 3 estimates the probability P concerning the realisation of the Bernoulli-distributed Y, given the presence of x. G is the logit function depending on the independent variables x and their coefficients.

Expression 4 is the predictive equation, in the form of a cross-sectional specification. The dependent variable is set across legislator i = 1, ..., n, and proposal j = 1, ..., m. The logarithmic scale of campaign contributions varies across legislators, as well as NOMINATE dimension 1 of political ideology. On the other hand, the dummy variable for lobbying activity shifts across bills.

4. Results

Table 6 presents the results of four linear logit specifications. The first three aim to assess the impact of each individual independent variable on voting 'yes'. The fourth evaluates the overall effect of the independent variables.

The isolated effect of each variable drives positively the likelihood of voting 'yes'. The interpretation of these values is not as intuitive as under classic linear regression (Wooldridge 2013). This is because the coefficients are reported in log-odds units, which is an alternative way of expressing probabilities (Hosmer and Lemeshow 1980). Such a notation establishes a relationship between the coefficient and the odds ratio⁹

$$OR = e^{\beta 1} \tag{5}$$

Equation (5) estimates the likelihood of the event voting 'yes'.

The first regression measures the individual effect of ideology on the probability of voting yea. The beta coefficient value of 2.342 suggests that if the legislator moves his ideal point towards conservatism, the likelihood of voting 'yea' increases. Plugging in

⁹ "It is a measure of association which has found wide use, especially in epidemiology, as it approximates how much more likely (or unlikely) it is for the outcome to be present." (Hosmer and Lemeshow 1980).

the odds ratio the value 0.5 in correspondence of legislator's ideology, the estimation yields the following result: OR (0.5) = exp (0.5 * 2.342) = 3.22. Hence, the more conservative a member of the House is, the more likely they are (3.22 times more) to support laws supporting financial deregulation. The most conservative position (+1) leads to OR (1) = exp (1 * 2.342) = 10.4. Conversely, taking a liberal position with a coefficient of -0.5, OR (-0.5) = exp (-0.5 * 2.342) = 0.39, increases the likelihood of approval for just 0.39 times.

Table 6. Logistic regression results

_		Dependent	variable:	
		vote	Yes	
	(1)	(2)	(3)	(4)
Ideology	2.342***			2.284***
	(0.069)			(0.070)
Contributions		0.427***		0.264***
		(0.026)		(0.028)
Lobbying			0.905***	1.012***
			(0.055)	(0.060)
Constant	2.118***	-2.022***	1.141***	-1.141***
	(0.028)	(0.234)	(0.049)	(0.259)
Observations	16,987	16,987	16,987	16,987
Log Likelihood	-5,880.869	-6,488.027	-6,499.578	-5,699.572
Akaike Inf. Crit.	11,765.740	12,980.050	13,003.160	11,407.150

Source: Author's own calculation.

The results of the first specification reported in Table 6 support the relationship between the probability of approving a bill and ideological position identified in Figure 2. Indeed, regardless of her ideological orientation, the legislator is always prone to support deregulatory measures. This result is further supported by the coefficient β_0 = 2.118, indicating that a non-partisan member of Congress would be approximately 8.31 times more likely to vote 'yes'.

The second logit model measures the what extent the logarithmic scale of campaign contributions affects the probability of voting 'yes'. Since it is a continuous variable, the coefficient's interpretation depends on its particular units of measure (Hosmer and Lemeshow 1980). Campaign contributions are measured in currency (\$), hence it has to be provided an economically significant value for lnV1 to interpret the results. As previously reported in Table 3, the average amount of financial resources received by a member of Congress for an electoral run (1998-2004) is \$14,928. Hence, it is of interest to assess how the estimated odds ratio of voting 'yes' would change with a \$15,000 increase in campaign contributions. The natural logarithm of 15,000 is approximately 10, hence the odds ratio is 71.5132. This value indicates that a \$15,000 increase in campaign contributions for each legislator would make them approximately 71 times more likely to approve a deregulation-oriented bill. The significance of this result is supported by $\beta_0 = -2.022$. This means that without contributions from the financial sector, a politician would be half as likely to approve deregulatory measures.

The third regression aims to assess the isolated effect of lobbying activity on voting 'yes'. It is a dichotomous variable taking the value 1 if the event occurs or 0 if it is absent. The odds ratio 2.47 indicates that the presence of lobbying effort increases by 2.47 times the likelihood of supporting deregulation. β_0 informs that if the finance lobby would be absent, politicians would be still driven to approve deregulation. This result indicates that campaign contributions provide the strongest support for the capture hypothesis.

The fourth model measures the extent to which the three independent variables affect the event voting 'yes'. The beta coefficients' positive sign informs that the regressors positively affect the likelihood of approving the bills of interest. The coefficients of legislator's ideology, campaign finance, and lobbying activity, take respectively the values: 2.284, 0.264, and 1.012. These correspond to the maximum

likelihood estimates of β_1 , β_2 , and β_3 respectively. The model's fitted values are given by the following equation

$$\hat{\pi}(x) = \frac{e^{-1.141 + 2.28 \ln V + 1.012*lb}}{1 - e^{-1.141 + 2.284*dim1 + 0.264*lnV1 + 1.012*lb}}$$
(6)

Where the estimated logit is

$$\hat{g}(x) = \ln\left(\frac{p}{1-p}\right) = -1.141 + 2.284 * dim1 + 0.264 * lnV1 + 1.012 * lb$$
 (7)

The specification reported by Equation 7 is the logistic regression equation, where *p* is the probability that a politician votes yes, given the explanatory variables.

 β_1 = 2.284 is the coefficient related to the measure of legislators' ideology. It assesses that a legislator is more likely to approve a deregulatory measure if they move towards conservatism, all other things being equal (ceteris paribus). However, as shown by the results of the first specification, a move towards a democratic ideology would not change the outcome of the estimation (ceteris paribus).

The coefficient associated with campaign contributions is 0.264. In other words, a \$15,000 increase in resources deployed by the financial sector to a House member leads to a 14-fold increase in the likelihood of voting 'yes' (ceteris paribus).

 β_3 = 1.012 is the coefficient evaluating the effect of lobbying activity. The finding is that the influence exerted by the financial sector increases 2.75 times the likelihood that a legislator votes yes (ceteris paribus).

5. Robustness checks

The Akaike Information Criterion (AIC) informs that a lower absolute value corresponds to a more accurate estimation (Gortmaker, Hosmer, and Lemeshow 1994). AIC and log-likelihoods tell that the most reliable model is the fourth one. The analysis

with robust standard errors has not been carried out because under logistic regression, the heteroskedasticity assumption is automatically accounted for (Wooldridge 2013).

Table 7 reports the Wald test's results, which informs that the beta coefficients related to each explanatory variable are fully statistically significant. The Wald statistic follows an asymptotic distribution with degrees of freedom equal to the number of restrictions being tested (Wooldridge 2013). The test consists of a null and of an alternative hypothesis. The former is that the variable's coefficient takes a value different from zero. The latter is that the beta coefficient equals zero, scenario under which the explanatory variables would lack of significance, implying that the corresponding variable should be dropped from the model (Agresti 2012).

Table 7. Wald test

	z value	Pr(> z)
(Intercept)	-4.40	0.0000
Ideology	32.49	0.0000
Contributions	9.54	0.0000
Lobbying	16.98	0.0000

Source: Author's own calculation

Table 7 shows that the null hypothesis cannot be rejected, since the p-values taken by the z-test are below any significance level (Agresti 2012). This outcome provides evidence that all the model's independent variables significantly affect the dichotomous response.

Table 8. ANOVA table, Chi-Squared test

	Df	Deviance	Resid. Df	Resid. Dev	Pr(>Chi)
NULL			16986	13243.29	
Ideology	1	1481.56	16985	11761.74	0.0000
Contributions	1	95.24	16984	11666.49	0.0000
Lobbying	1	267.35	16983	11399.14	0.0000

Source: Author's own calculation

Table 8 presents the analysis of the deviance table (a.k.a. ANOVA), which serves to evaluate whether the current logit framework represents the data better than a model

with only the intercept. It is an alternative way to measure explanatory variables' significance. To conduct an assessment, it is needed to evaluate the gap between the deviance and its residuals (the second and fourth column respectively) (Wooldridge 2013). As a general guideline, a greater disparity between these two quantities corresponds to increased model reliability. As shown in Table 8, the model's independent variables fit the data well. Moreover, the low p-value from the Chisquared test indicates that the predictors significantly explain variation.

Multicollinearity consists in embedding a regression model in variables having a common relationship in predicting the outcome. When such an issue arises, it causes idiosyncrasies in the model's results and a consequent interpretative bias. The correlation matrix is a tool identifying multicollinearity by measuring the extent to which the independent variables are interrelated. Figure 1 shows that there is a significant relationship between the logarithmic scale of campaign contributions and NOMINATE dimension 1 of political ideology. Since such a pair-wise correlation constitutes only a sufficient condition for multicollinearity, the Variance Inflation Factor (VIF) has been computed. The index measures the degree of inflation in the variance of regression coefficients, and if the VIF score exceeds an absolute value of 5, it indicates that the regression is affected by multicollinearity (Agresti 2012). Table 9 reports low values soundly rejecting the multicollinearity hypothesis.

Table 9. VIF score results

Ideology	Contributions	Lobbying
1.0316	1.0215	1.0103

Source: author's own calculation

Moreover, the computation of the VIF score provides further justification for removing 'partisanship' from the model. As shown by Table 10, embedding the model of the dummy variable *republican*, would imply the rise of multicollinearity. This suggests that ideology and partisanship are mutual proxies.

Table 10. VIF Score Results

Ideology	Contributions	Lobbying	Republican
6.5287	1.0215	1.0096	6.4677

To evaluate the goodness of fit of a logistic regression model, there is no R^2 specification measure (Wooldridge 2013). An alternative was developed by McFadden (1973), and it requires a different interpretation with respect to R^2 . Values ranging between 0.2 - 0.4 are considered evidence of excellent goodness of fit. The goodness of fit of the analysis' logistic regression is 0.2.10

Under logistic regression, the model's predictive ability is measured with the Receiver Operating Characteristic (ROC) curve. This is a device evaluating the usefulness of a binary classifier, which shows the trade-off between the true positive rate and the false positive rate of a classifier for various choices of the probability threshold (Bradley 1997). Figure 5 displays the ROC curve. According to the University of Nebraska Medical Center (UNMC), the closer the curve gets to the top left corner, the better the classifier is. A perfect classifier would yield a true positive rate of 1 and a false positive rate of 0. Thus, voting 'yes' is a good classifier, indicating that the model does better than random guessing regarding the phenomenon of interest. In supporting this graphical result, there is the Area Under the Curve (AUC) index, a useful tool for evaluating machine learning algorithms (Bradley 1997). The AUC's value related to the model is approximately 0.76, which is evidence of fair predictive ability.

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¹⁰ Author's own calculation.

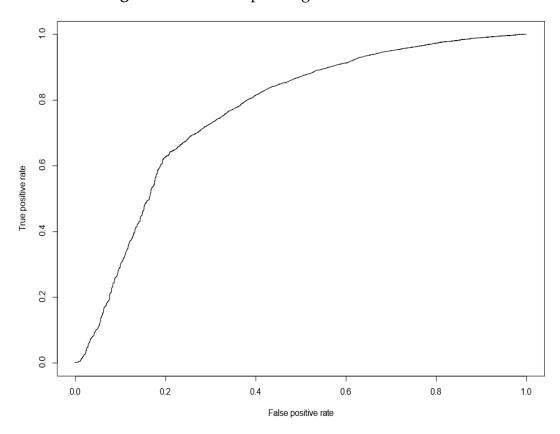


Figure 5. Receiver Operating Characteristic Curve

Outlier data points may alter the quality of a regression estimation (Hosmer and Lemeshow 1980). In order to assess the significance of extreme data points, the first step is the computation of the Cook's distance, which evaluates the extent to which the outcome of a model is affected by the removal of outliers (Cook 1977). Afterwards, it is needed to inspect whether the absolute standardized value of the residuals is above 3. Under this realisation, this data would be a potential source of bias in terms of results' interpretation (Hosmer and Lemeshow 1980). As illustrated by Figure 6, there are no outliers with standardised residual larger than 3, ensuring the reliability of the findings.

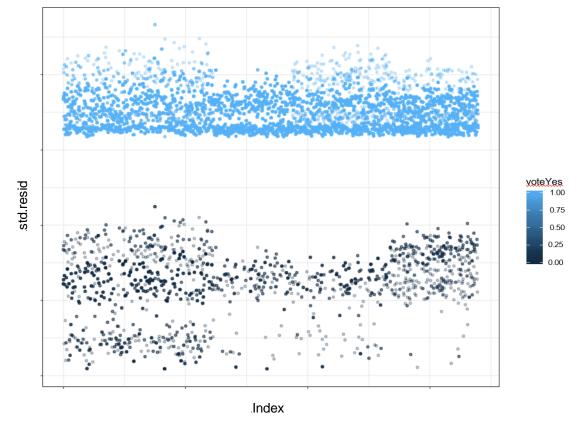


Figure 6. Plot of standardised residuals

6. Conclusion

This study's main finding is that the US Congress legislative process concerning financial deregulation throughout the period 1999-2007 was object of industry's capture. The approval of lax policies was positively and significantly affected by an increasing amount of campaign funding coupled with the presence of lobbying activities. Moreover, political ideology is not a notable proxy for explaining legislative behaviour. Indeed, partisanship is under control of the financial sector, which seems to be the major catalyst for the approval of the bills of interest.

Setting the analysis in the timeframe 1999-2007 aims at shedding light on the sources leading to financial markets' disruption. Furthermore, by providing empirical evidence that this wave of deregulation was induced by industry's capture, the model supports the hypothesis claiming that the Crisis was primarily caused by global banks (A. Baker 2010; P. R. Krugman 2009; Stiglitz 2010).

By advancing the empirical literature concerning the determinants of legislative behaviour, this analysis contributes to the political economy of financial regulation. Moreover, embedding further data sets concerning campaign funding (i.e. resources deployed by CEOs), an alternative methodology (i.e. general linear logit model), and an accurate and systematic legislative selection, this article enhances the literature on regulatory capture in banking.¹¹

Nonetheless, the model could be expanded through the introduction of further variables measuring the impact of other factors on the probability of voting 'yes'. For instance, it would be interesting to assess how legislators' behaviour is affected by holding multiple offices (i.e. being member of the Financial Markets' Committee). From a methodological perspective, the empirical framework could be advanced through cutting edge inferential statistical methods - i.e. Markov chain Monte Carlo estimation and machine learning (Bonica 2018; Clinton, Jackman, and Rivers 2004).

In a globally interconnected economy where finance covers a paramount role, regulation shall prevent the rise of a scenario where economy growth is led by speculative motives (Keynes 2018). Financial markets require an effective and sustainable regulatory framework supporting welfare's maximisation (Lo 2008), and a more cogent legislation impeding the private sector to affect the governance of democratic institutions. This rationale is driven by two reasons. First, the consequences of financial crises damage mostly the lower-middle class (Krugman 2008). The second is that finance is a wealth concentration device (Mazzucato 2018; Piketty 2015),¹² causing the creation of highly concentrated political power lacking of democratic accountability and consummate monitoring (Chomsky 2011; Stiglitz 2012).

To tackle these issues, I argue that regulatory and political authorities should invest in scientific research investigating the effects of regulations on the stability of the financial system. This task would steer legislators and the economy to operate for

¹¹ The main empirical works analysing the topic and its far-reaching implications are (Bertrand, Bombardini, and Trebbi 2014; Bombardini and Trebbi 2011; Igan, Mishra, and Tressel 2012; Mian, Sufi, and Trebbi 2010). For a compelling review see Igan and Lambert (2018).

¹² "[...] the highest-earning 0.01 per cent of U.S. families (150,000 in number), for example, now receives 10 per cent of all the income earned by the remain 150 million families, three times the 3 to 4 per cent share that prevailed from 1945 to 1980. It is no secret that about 35,000 of those families have made their fortunes on Wall Street." (Bogle 2011, 22–23).

society as a whole. Indeed, financial stability should be considered as a public good, which has to be delivered unconstrained (Acemoglu, Ozdaglar, and Tahbaz-Salehi 2015).

However, given the recent bipartisan amendment of the 'Dodd-Frank Wall Street Reform Act of 2010', such commitment sounds hard to accomplish. Indeed, the 'Economic Growth, Regulatory Relief, and Consumer Protection Act of 2018' amends precautionary provisions which were taken after the Crisis. The legislation from 2018 exempts certain financial institutions from the 'Volcker Rule', ¹³ enabling them to engage in risky activities. ¹⁴ Moreover, the bill supports the mortgage credit market's expansion, removing certain creditworthiness requirements.

The current scenario is similar to 1999, in which laws enacted tackling the Great Depression were amended.

Is the global economy heading towards the next deregulation-driven financial crisis?

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¹³ "It prohibits a banking entity from engaging in proprietary trading or investing in, sponsoring, or having certain other relationships with hedge funds or private equity funds. It also provides for additional capital requirements." (Whitehead 2011, 47).

¹⁴ "[...] banks with total assets valued at less than \$10 billion, and trading assets and liabilities comprising not more than 5% of total assets.", U.S. Congress, House, *To promote economic growth, provide tailored regulatory relief, and enhance consumer protections, and for other purposes* (Economic Growth, Regulatory Relief, and Consumer Protection Act), S. 2155, 115th Cong., Passed House without amendment 22 May, 2018.

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Appendix A - Legislation of interest

Table A1. Roll call votes, 106th Congress

Bill Number	Yea	Nay	Description
HR1400	332	1	Bond Price Competition Improvement Act 1999
HRES235	227	203	Financial Services Act (providing consideration)
HR10	238	189	Amendment Financial Services Act
HR10	407	20	Amendment Financial Services Act
HR10	226	203	Amendment Financial Services Act
HR10	427	1	Amendment Financial Services Act
HR10	343	86	Financial Services Act (on passage)
S900	241	132	Financial Services Modernization Act (on motion)
HRES355	335	79	Financial Services Modernization Act (on agreeing)
S900	362	57	Financial Services Modernization Act (on agreeing)
HR1089	358	2	Mutual Fund Tax Awareness Act
HR4541	377	4	Commodity Futures Modernization Act
HR1776	225	201	Amendment Homeownership and Economic Opportunity Act
HR1776	299	124	Amendment Homeownership and Economic Opportunity Act
HR1776	417	8	American Homeownership and Economic Opportunity Act
HR4923	394	27	Community Renewal and New Markets Act

Source: (Lewis Jeffrey BPoole et al. 2018)

Table A2. Roll call votes, 107th Congress

Bill Number	Yea	Nay	Description
HRES161	418	1	Investor and Capital Market Fee Relief Act
HRES161	408	12	Investor and Capital Market Fee Relief Act
HR1088	404	22	Investor and Capital Market Fee Relief Act
HR3763	334	90	Corporate and Auditing Accountability and Responsibility Act
HR3717	408	18	Federal Deposit Insurance Reform Act
HR3764	422	4	Investor and Capital Market Fee Relief Act
HR3763	423	3	Corporate and Auditing Accountability and Responsibility Act
HR333	306	108	Bankruptcy Abuse Prevention and Consumer Prevention Act

Source: (Lewis Jeffrey BPoole et al. 2018)

Table A3. Roll call votes, 108th Congress

Bill	Yea	Nay	Description	
Number				
HR522	411	11	Federal Deposit Insurance Reform Act	
HR658	423	0	Accountant, Compliance, and Enforcement Staffing Act	
HR923	416	3	Premier Certified Lenders Program Improvement Act	
HR2622	393	30	Fair and Accurate Credit Transaction Act	
HR2420	418	2	Mutual Funds Integrity and Fee Transparency Act	
HR2622	380	49	Fair and Accurate Credit Transaction Act	
HR1375	418	0	Amendment Credit Transaction Act	
HR1375	392	25	Financial Services Regulatory Relief Act	
HR3574	312	111	Stock Option Accounting Reform Act	
HR975	315	113	Bankruptcy Abuse Prevention and Consumer Protection Act	

Source: (Lewis Jeffrey BPoole et al. 2018)

Table A4. Roll call votes, 109th Congress

Bill Number	Yea	Nay	Description
HR1185	413	10	Federal Deposit Insurance Reform Act
HR1224	424	1	Business Checking Freedom Act
HR3505	415	2	Financial Services Regulatory Relief Act 2005
HRES906	223	197	Credit Rating Agency Duopoly Relief Act
HRES906	308	113	Credit Rating Agency Duopoly Relief Act
HR2990	418	2	Credit Rating Agency Duopoly Relief Act
HR5337	424	0	National Security Foreign Investment Reform
S2856	417	0	Financial Services Regulatory Relief Act
HR5585	392	0	Financial Netting Improvement Act

Source: (Lewis Jeffrey BPoole et al. 2018)