Chapter 9: Forecasting Political Developments with the Help of Financial Markets[1]

By Gerald Schneider

Introduction

It is a truism to say that forecasting political and economic trends continues to be a booming business (Sherden 1997). Within academia, however, many still conceive of prediction as a less noble task than explanation. The widespread mixture between attraction and skepticism leveled at professional foreboders can even be found among those who have transformed forecasting from an obscurantist business associated with astrology, crystal gazing and propheteering into a key part of "normal science". The example of Oskar Morgenstern, one of the founders of modern game theory, illustrates this ambivalence nicely. In one of the earliest treatises on economic forecasting he stated apodictically: „Economic prognosis is ….impossible because of objective reasons" (Morgenstern 1928:108, own translation). Yet, this co-founder of game theory and leading strategic analyst continued to publish on the topic and evaluated for instance the random walk thesis together with Nobel laureate Clive Granger (Granger and Morgenstern 1970).

Nevertheless, the acceptance and popularity of prediction as an academic endeavor vary greatly across social scientific disciplines. While the combination of explanation and prediction is the natural way to do research in demography or econometrics, political scientists are generally still hesitant to engage into this seemingly dirty business. One of the traditional reasons for this unwillingness has been the inaccuracy of standard techniques like opinion polling to forecast specific developments like election outcomes.

Forecasting political events does, however, no longer warrant this platonic approach. The development of two techniques – betting markets and expert interview-based decision models – has considerably changed the predictive accuracy of attempts to forecast the outcomes of political decision making. In this paper, I present an approach that marries some

of the advantages that these two approaches offer. I test whether the collective information that financial markets contain can be used to predict both political developments and individual political events. To this end, I review recent contributions to the so-called Condorcet Jury Therorem which argues that collectives are better able to recognize the true state of the world than individual experts. I argue that financial markets can function like juries which discuss the available evidence in order to reach a correct decision (Coughlan 2000).

I use the political developments in the Levant, which has been, as we all sadly know, one of the most conflictive regions of the world throughout the past 60 years, to evaluate the predictive potential of financial markets within a political context. As severe political events such as the confrontations between Israel and its neighbors often have repercussions in the economies of the warring parties and elsewhere, we should expect that well-trained brokers serve as quasi-policy experts who build up scenarios over alternative political risks (Schneider and Troeger 2006a, b). The anticipation of significant political events should, as a consequence, find its reflection in the price of securities and the buying and selling decisions that the financial intermediaries make. If a certain economically relevant event does not come as a complete surprise, it is thus *ex ante* contained in the price of a particular security. We can consequently conceive of financial markets as the aggregate opinion on the likelihood of alternative political scenarios that the financial intermediaries develop. The aggregate decision that traders make should be relatively accurate not the least because of the costs of faulty predictions. In contrast to interviewed policy experts who only occasionally have to fear a loss of reputation, financial traders will loose money if their decisions rely on erroneous political information. Yet, information from financial markets is not always useful for predictive purposes. The approach that I present here is not valid for the prediction of political developments i) which are economically not highly salient, ii) for which relevant decision

making information is restricted to a few policy insiders and iii) in which many individual events come as surprises.

Using standard econometric techniques, I test the relative predictive accuracy of naïve autoregressive models in predicting political events with competing models that contain information from financial markets. The evidence assembled shows that information from stock markets sensibly improves the predictive accuracy of models that largely rely on the auto-regression of the series under examination to produce forecasts. The lagged development of the Tel Aviv Stock Exchange allows me to predict the level of cooperation in the conflict between Israel and the Palestinians the following day more precisely than with an alternative model that just takes the lagged political interactions into account. Because violent events come much more often as a surprise than cooperative developments, the inclusion of financial market information does, in return, not improve the accuracy in the prediction of the daily level of conflict in the Middle East.

I organize this chapter as follows: I will first review recent developments in the literature on political forecasting and develop a typology that allows me to see when a particular approach is adequate. Next, I will present the research design and empirical evidence. The paper concludes with some recommendations and warnings on the technology that is introduced through this article.

A Typology of Research Strategies in Political Forecasting

The traditional forecasting approach in the social sciences is based on econometrics and thus on the different scenarios that one can obtain from running competing statistical models. Yet, the predictions that a researcher is able to develop are as good as the information that is fed into the regressions. The requirement of a sound empirical footing of any forecast is particularly relevant for the analysis of key social or economic trends that are heavily influenced by a multitude of arcane decisions in various political settings. As neither reliable

dynamic nor detailed micro-level information is obtainable for most decision making processes, political econometrics often only resorts to crude macro-level indicators that do not vary much over time. Unsurprisingly, models of developments that are heavily shaped by political decisions, but rely on this limited empirical basis often only provide shaky forecasts, as the experiences with the *World Futures* reports of the 1970s and 1980s amply tell. The limited usefulness of macro-quantitative political data for predictive purposes is the reason why forecasts of political events frequently pursue different research strategies nowadays. They particularly base their predictions on information from individuals, be they explicit experts, quasi-experts working in another decision making environment or samples of the general population.

If political analysts base their predictions on judgmental information, they have to make two fundamental choices: The first decision relates to the question of whether or not the purpose of a research endeavor is the prediction of a single event or of a particular political development, which is simply a number of related events. A second consideration is whether the information gathered from few or many people is deemed to be more accurate for the particular forecasting problem under consideration. If one combines the decisions made along these two dimensions, one can distinguish four ideal types of judgment-based political forecasts, which I introduce in Figure 1.

[Figure 1 about here]

Predictions based on "few" individuals: Single or small groups of experts are frequently used to predict scenarios for the development in a particular area; one of the key methodologies used is the Delphi method. The basic trick of this technology is to ask experts through repeated questionnaires what their opinion on a specific scenario is. Several authors have

questioned the accuracy of this approach: "Delphi is undeserving of all of the attention it has received" (Amstrong 1978:410) while a recent survey comes to a more positive evaluation (Rowe and Wright 2000). Two particularly troublesome aspects of the approach are that the experts have to achieve a consensus and that the process through which they arrive there is not explicitly modeled.

This problem is circumvented in the forecasting approach that Bueno de Mesquita has introduced based on his expected utility approach to decisions on war and peace. Within this model-based framework, the opinion of the expert is only used as an input for a forecasting tool that has its foundations in decision and game theory (e.g. Bueno de Mesquita, Newman and Rabushka 1985, Bueno de Mesquita 2002). This approach has been applied to a variety of issues and also to some evaluations by like-minded scholars (Bueno de Mesquita and Stokman 1994, Stokman and Thomson 2004).[1] The relative predictive accuracy of the models is impressive. Feder (1994, see also Ray and Russett 1996) reports a success rate of 90% for the analyses that the CIA had commissioned. In a recent evaluation of the predictive accuracy of this and related game-theoretic models, other approaches based on standard bargaining models performed, however, slightly better (Thomson et al. 2006, Schneider, Finke, and Bailer 2005).

The main advantage of the forecasting approach pioneered by Bueno de Mesquita is that the level of expertise that is required from an interview partner is modest and only relates to an evaluation of the present. Hence, game-theoretic models that are used to produce forecasts rely on the estimates that the interviewed expert provides with regard to the actors´ preferences, power and the importance they attach to the various contested issues. As Bueno de Mesquita (2002:69) argues, the validity of the expert judgment is a less crucial aspect than one might think: "…it turns out that the vast majority of specialists basically view this

---

[1] Since expert judgment is only used as a data input, the empirical basis could also consist of macro-political information. The author has pursued this alternative strategy to test the predictive accuracy of a game-theoretic model in an application of competing bargaining models on international economic negotiations (Schneider 2005).

information in the same way." To search for detailed information that only few experts can provide seems particularly adequate for the analysis of decision making situations where the informed public is unable to locate the intentions and the power of key decision makers. Yet, the incentive of the expert to deliver precise information is modest, and the interviewer has often no real chance to verify how accurate the expert estimates are. As I will argue below, there are thus certain situations in which the reliance on a pool of less-qualified experts rather than some selected key informants seems desirable.

Predictions based on "many" individuals: The main reason as to why financial market information should improve forecasts for some political developments depends on the costliness of the decisions that traders make. A broker includes relevant economic *and* political information when deciding about selling or buying a particular security. If a financial market heavily depends on political decisions, traders build up expectations about the likelihood of certain scenarios in the political realm. A typical example is whether or not a left-wing or a right-wing party will be elected into government in an upcoming election. As the announced economic policies of these competing political forces differ, neglecting the possibility that an election might be more or less favourable to particular financial transactions is highly risky. Even if market participants are not completely "rational" in the technical sense of the term, they will try to anticipate important political events and developments. A large number of studies has shown in this vein that markets systematically include relevant information from an ongoing electoral campaign (e.g. Leblang and Mukerjee 2005). In addition, I have shown in collaborative work with Vera Troeger that world stock markets have reacted systematically to escalatory and de-escalatory moves in three conflicts throughout the 1990s (Schneider and Troeger 2006a, b). As some of the events like upcoming party congress speeches or meetings between heads of states are easily foreseeable, it would

be irrational for traders to refrain from partly anchoring their current buying and selling decisions on an anticipated political event that will have economic repercussions.

The Condorcet Jury Theorem (CJT) provides a theoretical rationale for my assertion that a large number of non-experts can provide on some occasions more accurate forecasts on political developments than the average individual expert. In my view, financial markets function like large decision making committees that have to decide between competing hypotheses about the future. To deal with this form of belief rather than preference aggregation, the reliance on the CJT seems especially appropriate. The CJT states, in its canonical version, that the competence of a group in recognizing p, the true state of the world, is larger than the average individual competence. Further, this collective capability approximates 1 if the size of the committee grows. Large committees like the traders assembled in a financial market would accordingly be able to reach almost "correct" decisions in situations where the decision makers share the same fundamental preference, but receive different information about the state of the world.[2]

It should be noted, however, that the CJT does not generally hold. Berg (1993) showed that the collective competence might be smaller than the one of the average individual if the individual beliefs are correlated. Furthermore, the collective does not increase its competence if the number of marginally competent individuals (p slightly larger than 0.5) increases (Paroush 1998). In a world of strategic rather than "sincere" traders, the collective wisdom can be more erroneous than the average individual decision (Austen-Smith/Banks 1996).[3] As Feddersen and Pesendorfer (1998) demonstrate, unanimity and thus the consensus opinion to which herding traders refer might be the worst decision making rule from an informational

---

[2] The CJT assumes that i) the average competence p exceeds 0.5, ii) that their judgments are independent of each other and iii) that they "vote" for one state of the world in a sincere fashion. See Grofman and Feld (1988), Young (1988) and Lada (1992) for introductions.
[3] The main assumption behind this counterintuitive result is that the signals that committee members receive about "reality" are at least partly private. A strategic voter has, in this implict voting model, an interest to cast the decisive vote while a sincere jury member always follows the private information she possesses. Technically, the Austen-Smith and Banks models means that sincere voting is generally not a Nash equilibrium and the collective ability to choose the "correct" solution is smaller than the average individual one.

perspective. Their hypothesis that a curvi-linear relationship between the decision making quorum and the error probabilities exists receives empirical support in the experiments by Guarnaschelli, McKelvey and Palfrey (2000). Yet, Coughlan (2000) qualifies this result and shows that unanimity is the most information efficient decision making rule if a jury faces the risk that a mistrial occurs – no unanimous decision is reached - or if its members are able to communicate their private information.

I assume for my empirical application along these lines that financial markets can be conceived of as a collective decision making body that also evaluates those political processes that are important for the development of the securities. Even though the traders are far from being well-informed experts in a certain election, a militarized dispute between two states or the economic policy making process of a certain country, they have considerable incentives to inform themselves about the possible outcome of important collective political decisions. Most importantly, they talk with each other about the different scenarios so that the anomalies of judgement aggregation uncovered by Austen-Smith and Banks as well as Feddersen and Pesendorfer (1998) do not matter. If traders refrain from building sensible forecasts about important political developments, they jeopardize the value of securities they are trading with and possibly also harm their personal careers. If a political process is thus relatively easy to understand and economically relevant, they will build up collective forecasts that can be used to predict the ups and downs in the political arena.

Obviously, markets can be wrong in their assessments. In an early application, Bueno de Mesquita (1990) uses the money market discount rate as an indicator for the anticipated costs of conflict to evaluate the expectations contemporary agents had over the confrontations between Austria and Prussia in the 19th century. Analysing the Seven Weeks´ War and the crucial battle at Königsgrätz, he writes:

"This reinforces the widely reported observation that Prussia was expected to lose the war….the expectations in the financial markets were updated to take account of the new information revealed on the battlefield – that the market had underestimated Prussia´s chance of victory. The prewar fears of postwar inflation or of defaults on money instruments by a defeated Prussia were allayed by Prussia´s decisive victory" (Bueno de Mesquita 1990:44-45)

This article pursues a similar line of inquiry and asks whether stock market data can be used to forecast the political climate of the Levant. This conflict, which has been dominated by the confrontation between Israel and the Palestinians throughout the past six decades, certainly belongs to the category of disputes that have consequences for the world economy (Schneider and Troeger 2006a) as well as individual sectors (e.g. Fleischer and Buccola 2002, Schneider and Troeger 2006b). As the developments within this conflict region are well reported, several researchers have attempted to forecast escalations for the various dyads (e.g. Schrodt and Gerner 2000). These forecasts are, however, largely a-theoretical. Based on a variety of methodological tools, these applications typically use past information from this conflict region to predict future patterns of interaction. This article moves beyond the tradition of solely relying on autoregressive models to produce predictions by including information from a collective quasi-expert – the stock market – in the regression.

Research Design

This paper examines whether aggregate financial market indicators improve the predictive accuracy of time series models that only rely on the characteristics of the series itself. For this purpose, I will use a key index of the Tel Aviv Stock Exchange, the TA 100, to evaluate whether financial traders can be conceived as a collective decision making body which assesses the probability of different political scenarios in the Levant. The application

aggregates the TA 100 data at the daily level and regresses it on two indicators of Levant conflict: sum of cooperation and sum of conflict. I have used the data on Levant conflict that was collected by the Kansas Event Data System (KEDS).[4] This prominent collection of event data sets has already served as the empirical basis for some predictive inquiries (e.g. Pevehouse and Goldstein 1999, Schrodt and Gerner 2000). As it is common with event data, the events identify the "sender" and the "target" of a cooperative or conflictive act within a dyad of political actors. The outcome variables used in this chapter summarize the information across all relevant dyads in the Levant from January 1, 1990, to June 30, 2004.

To predict the daily level of cooperation and conflict, I will use ARMA (1, 0) and EGARCH (1, 1) models. The former approach includes an autoregressive parameter to predict the mean of cooperation and conflict. The latter technique is based on a standard tool within financial econometrics, the Generalized Autoregressive Conditional Heteroskedasticity (GARCH) models due to Bollerslev (1986) and Engle (1982, see also Beck 1983).

The usage of a GARCH model is appropriate because the error variance of the conflict and cooperation series varies over time.[5] Hence, in an intensive political conflict like the one going on in the Middle East since more than six decades, events of a particular type often come in clusters so that periods of high volatility follow periods of low volatility. This simply means for the conflict in the Levant that "bad days" in the form of a bomb attack are most likely followed by another violent episode in the next time period, while a cooperative gesture typically triggers another conciliatory move the next day. The canonical GARCH (1,1) model

---

[4] The machine coded event data set, of which I have used an update from 2004, was screened for possible coding errors before the analysis. A few events like for instance a report on a soccer game were excluded from the data set that was used in the analysis A more recent Levant dataset can be found at the KEDS website (http://www.ku.edu/~keds/, last consulted May 16, 2006).
[5] Engle (2001) is one of the many introductions to these modelling tools.

uses two parameters, the error coefficient α and the lag coefficient β, in the conditional

variance equation that is added to the prediction of the mean of the series under examination.[6]

GARCH models assume a symmetric effect of positive and negative errors on the

volatility of the series. To control for asymmetric responses in the variance to positive and

negative developments, I will examine the appropriateness of a modification of the GARCH

model, the so-called EGARCH approach developed by Nelson (1991).[7] The assumption of

asymmetric responses was appropriate in a related inquiry in which we attempted to predict

the reactions of stock markets to both cooperative and conflictive events in three conflicts

(Schneider and Troeger 2006a, b).

The stock market variable is differenced because high-frequency financial data, such

as daily stock market indices, exchange or interest rates are almost always driven by

stochastic processes.[8] The stock market information is included in the mean equation of the

models that test the main conjecture of this paper; I include in all models an autoregressive

term to predict the sum of conflict or cooperation that occurred the next day within the overall

conflict region. The statistical models also include the lagged variable "bad day" for the

calculation of the variance equation. This is in line with the expectation that particularly

conflictive events increase the uncertainty of the traders with the effect that the volatility of

the series grows. Note that the estimations refer to the same number of cases so that the

statistical models are truly comparable. Summary statistics of the data used for the analysis

can be found in the appendix.

---

[6] Formally, the conditional variance equation in the GARCH (1,1) model takes the following form:
$\sigma_t^2 = \omega + \alpha \varepsilon_{t-1}^2 + \beta \sigma_{t-1}^2$ where ϖ is the GARCH constant.

[7] The conditional variance equation of the E-GARCH model looks as follows:

$$\log\left(\sigma_t^2\right) = \varpi + \delta_1 \left| \frac{\varepsilon_{t-1}}{\sqrt{\sigma_{t-1}^2}} \right| + \delta_2 \frac{\varepsilon_{t-1}}{\sqrt{\sigma_{t-1}^2}} + \beta \log\left(\sigma_{t-1}^2\right)$$

Asymmetry can be observed in case δ_2 differs significantly from 0.

[8] As the respective tests statistics have shown, neither unit-root (Phillips-Perron and Dickey-Fuller tests) nor co-integration (Johansen test) problems hampered this analysis.

The Prediction of the Daily Sum of Cooperation and Conflict

Conflict in the Levant has followed a largely erratic pattern throughout the period under observation. Figure 1-A depicts the daily net sum of cooperation which stands for the difference between the absolute values of cooperation and conflict. Sparks of cooperation are visible in the mid-1990 when the Oslo peace process stirred the hope of a permanent settlement between Israel and the PLO. The Madrid conference of October 1991 did not lead to a similarly positive eruption of cooperation; this mediation attempt by the USA and the USSR stood at the end of the conflict between the Western-led alliance against Saddam Hussein which also instigated – together with events associated with the first Intifada which was then waning out – considerable turbulence in the Levant. The magnitude of these largely conflictive clusters of events, however, never reached the magnitude of conflict that the second Intifada brought to the region. The visit of Ariel Scharon, who was then leader of the Likud party, to the Temple Mount was among the catalistic events in this confrontation.

In contrast to the conflict data the stock market series depicted in Figure 2-B shows a clear trend. The TA100 has grown steadily throughout the 1990s, interrupted by a short downturn in 1993. Similar to the world markets, the TA100 peaked shortly after the beginning of the new decade. An abrupt fall was followed by a short recovery and a longer crisis. The Tel Aviv stock exchange, however, rebounded again in early 2003.

(Figure 2 about here)

As the political and the financial series are visually not related in any meaningful way, we need statistical tools to estimate the impact of lagged cooperative and conflictive events on the TA100. To this end, I present in Table 1 the results of four ARMA (1,0) and EGARCH (1,1) models. The dependent variables are the daily sum of cooperation across all dyads in the

region and the equivalent measure for the daily level of conflict, which is coded negatively. The full models that I calculated for all different outcome variables include the differenced and lagged stock market information, the reduced ARMA and EGARCH models, by contrast, only use autoregressive parameters.

(Table 1 about here)

The results reported in Table 1 clearly demonstrate that the stock market can be partly used to predict political developments in the Levant. However, this is only the case for cooperative events, not conflictive ones, and even there, the results are not always completely convincing. The divergence in the capacity of the stock market to predict well across different types of events does certainly not come as a complete surprise. In general, conflict is harder to predict than cooperation. If surprising conflictive events like bombings were foreseeable, they would not happen – or at least not that often. The relationship between the lagged and differenced TA100-series and the cooperation series means that traders anticipate cooperative events before they are actually going to happen. The calculations suggest that the substantive effect of a one-point rise in the main Tel Aviv stock market index is followed by a 0.32 increase in the sum of cooperation across all Levant dyads the next day. A similar, but somehow reduced and statistically only marginally significant effect is observable for the autoregressive model.

The analysis also shows that both conflict and cooperation are highly autoregressive processes. Furthermore, there is strong evidence that the cooperation and conflict series share some of the characteristics of the high-frequency data typically analyzed in financial econometrics. The parameter estimations for the variance equations in the EGARCH models show that particularly bad days increase the volatility of the conflict series and decrease the variance with regard to the net sum of cooperative events. This latter result can easily be explained through the tendency of severe events to render cooperation less likely, thus

reducing the level of cooperation and simultaneously the volatility of this series. The first δ-parameter in the estimation of the cooperation series similarly indicates that conflictive shocks have a strong effect on the series variance.

The analysis conducted so far leads to the question of whether or not one can predict particular events well with the approach pursued in this chapter. I will try to do so in the following through the usage of simple forecasting models that try to predict the level of cooperation that happened the next day. I will compare the predictive accuracy of the EGARH (1,1) and the autoregressive models that either include the stock market information or not. The events that I have selected for exploring the ability of stock market data to deliver point predictions for political events are the salient cooperative events listed in Schneider and Tröger (2006a) and some of the key cooperative events that happened outside their period of examination from 2000 to the end of June 2004. Table 2 reports the predicted values of the four models and the real sum of cooperation that was observed on a particular day. Note that I have chosen the next day with a forecast in case that the Tel Aviv stock market was closed on the day during which a particularly cooperative event happened.

[Table 2 about here]

The attempt to forecast individual cooperative events with four different statistical models largely confirms the earlier reported result that the EGARCH models with the lagged stock market information provides the most accurate forecasts. In eight of the 12 chosen events, its point predictions came closest to the real sum of cooperation. However, the inclusion of the financial market series does not make much of a difference as the a-theoretical EGARCH model came up seven times with either the best or the second best forecast. In general, the predicted values underestimate the level of cooperation that occurred at these particularly significant days. The mean average error of the forecasts are thus, to put it more technically,

quite considerable. This does, however, not undermine the general message of this article according to which a pool of quasi-experts – like the traders on a stock market – can in some instances be used to forecast political trends and events.

Conclusion

Forecasting political developments has for a long time been left to area experts, mediagenic academics or the infamous taxi-driver that the busy journalist selected for his journey from the airport to the down-town hotel. Fortunately, some recent methodological advances allow us to move beyond this dire state of affairs and to make forecasting a routine part of academic inquiry in the social sciences. This chapter adds to this emerging literature by trying to systematically predict conflictive and cooperative patterns of interactions in the Levant and thus one of the regions in which the interactions between the various political forces belong to the most volatile on the world.

The goal of this contribution was largely theoretical rather than methodological. I particularly attempted to show that political forecasting should rely on the judgment of many rather than a selected few experts in situations in which large collectives build an opinion on a particular political development. In my view, this is particularly the case for decisions on war and peace that affect the lives and well-being of many individuals. In the case of the Levant, one of the appropriate juries to gauge systematic forecasts is the financial community. As escalations and de-escalations on the Levant have important political and economic repercussions around the world, I can assume that financial markets try to anticipate the change of tide in this conflict region.

I have used recent research on the Condorcet Jury Theorem to argue that we can perceive financial markets as collective deliberative decision making bodies whose predictions *can be* more accurate than the forecasts of individual policy experts. The usage of GARCH and simple autoregressive models has confirmed that we can use the lagged stock

market information to forecast political developments. In particular, the analysis has shown that financial markets forecast cooperative events, but not necessarily conflictive ones. Hence, although we might rely on financial markets to predict positive developments, the financial community is often not a good in predicting in what also security services, the military and the media are especially bad in auguring – violent conflict.

Appendix: Summary statistics of variables

Variable	Observations	Mean	Standard dev.	Minimum	Maximum
Conflict	2550	-68.4	87.3	-1049.6	0.0
Cooperation	2550	34.5	34.5	0	399.6
Net cooperation	2550	-33.5	73.5	-946.0	280.9
Bad day	2550	0.05	3.9	-38.31	213.0
D(TA 100) t-1	2550	21.7	74.1	-199.4	263.1

Acknowledgements:

Literature

Armstrong, J. Scott. 1978. *Long Range Forecasting: From Crystal Ball to Computer*. New York: Wiley.

Austen-Smith, David & Banks, Jeffrey S. (1996). Information Aggregation, Rationality and the Condorcet Jury Theorem. *American Political Science Review* 90/1:34-45.

Beck, Nathaniel 1983. „Time-Varying Parameter Regression Models". *American Journal of Political Science* 27/3:557-600.

Berg, Sven 1993. Condorcet´s Jury Theorem, Dependency among Jurors. *Social Choice and Welfare* 10:87-96.

Bollerslev Tim 1986. "Generalised Autoregressive Conditional Heteroskedasticity" *Journal of Econometrics,* 31: 307-27

Bueno de Mesquita, Bruce 1990. "Pride of Place: The Origins of German Hegemony". World Politics 43:28-52.

Bueno de Mesquita, Bruce 2002. *Predicting Politics*. Columbus: Ohio State University Press.

Bueno de Mesquita, Bruce and Frans Stokman. Eds. 1994. *European Community Decision Making: Models, Applications, and Comparisons*. New Haven, CT: Yale University Press.

Bueno de Mesquita, Bruce, David Newman and Alvin Rabushka. 1985. Forecasting Political Events. New Haven, Conn.: Yale University Press.

Coughlan, Peter J. 2000. In Defense of Unanimous Jury Verdicts: Mistrails, Communication and Strategic Voting. *American Political Science Review* 94:375-93.

Doran, Charles F. 1999. "Why Forecasts Fail: The Limits and Potential of Forecasting in International Relations and Economics". International Studies Review 1/2: 11-41.

Engle, Robert. 1982. Autogregressive Conditional Heteroskedsticity with Estimates of the Variance of U.K. Inflation". *Econometrica* 50:987-1008.

Engle, Robert. 2001. "GARCH 101: An Introduction to the Use of ARCH/GARCH Models in Applied Econometrics." Journal of Economic Perspectives 15:157-168.

Feddersen, Tim & Pesendorfer, Wolfgang (1997). Voting Behavior and Information Aggregation in Elections with Private Information. *Econometrica* 65/5:1029-1058.

Feddersen, Tim & Pesendorfer, Wolfgang (1998). Convicting the Innocent: The Inferiority of Unanimous Jury Verdicts. *American Political Science Review* 92:23-35.

Feddersen, Timothy & Pesendorfer, Wolfgang (1999). Perspectives - Elections, Information Aggregation, and Strategic Voting. *Proceedings of the National Academy of Sciences of the United States of America*. 96/19:10572-10574.

Feder, Stanley. 1995. "Factions and Policaon: New Ways to Analyze Politics." In H. Bradford Westerfield ed. *Inside CIA´s Private World: Declassified Articles from the Agency´s Internal Journal, 1955-1992*. New Haven, Conn.: Yale University Press, pp. 274-22.

Fleischer, Aliza/Buccola, Steven. 2002. „War, Terror, and the Tourism Market in Israel." *Applied Economics* 34/11:1335-1343.

Goldstein, Joshua S. 1992. "A Conflict-Cooperation Scale for WEIS Events Data". *Journal of Conflict Resolution* 36:369-385

Granger, Clive W. J./Morgenstern, Oskar 1970. *Predictability of Stock Market Prices*. Lexington, Mass.: Heath.

Lada, Krishna K. 1992. The Condorcet Jury Theorem, Free Speech, and Correlated Votes. *American Journal of Political Science* 36:617-634.

Morgenstern, Oskar 1928. *Wirtschaftsprognose. Eine Untersuchung ihrer Voraussetzungen und Möglichkeiten*[Economic Prognosis. An Examination of its Conditions and Possibilities]. Vienna: Julius Springer.

Nelson, Daniel B. 1991. Conditional Heteroskedasticity in Asset Returns: A new Approach. *Econometrica* 59 (2): 347-70.

Pevehouse, Jon C./Goldstein, Joshua S. 1999. "Serbian Compliance or Defiance in Kosovo? Statistical Analysis and Real-Time Predictions". *Journal of Conflict Resolution* 43/4:538-546.

Ray, James Lee and Bruce Russett. „The Future as Arbiter of Theoretical Controversies: Predictions, Explanations and the End of the Cold War". *British Journal of Political Science* 26/4:441-470.

Rowe, Gene and George Wright. 1999. "The Delphi Technique as a Forecasting Tool: Issues and Analysis". *International Journal of Forecasting* 15/4:353-375.

Schneider, Gerald and Vera E. Troeger. 2006a. „War and the World Economy: Stock Market Reactions to International Conflicts, 1990-2000". *Journal of Conflict Resolution*.

Schneider, Gerald and Vera E. Troeger. 2006b. „Winners and Losers of War: Evidence from Three Stock Markets". Unpublished working paper.

Schneider, Gerald, Daniel Finke and Stefanie Bailer. 2005. „Bargaining Power in the European Union: An Evaluation of Competing Approaches". Unpublished, University of Konstanz.

Schneider, Gerald. 2005. "Capacity and Concessions: Bargaining Power in Multilateral Negotiations." *Millennium* 33/3: 665-690.

Schrodt, Philip A./Gerner, Deborah J. 2000. "Using Cluster Analysis to Derive Early Warning Indicators for Political Change in the Middle East, 1979-1996." *American Political Science Review* 94,4: 803-818.

Sherden, William A. 1997. *The Fortune Sellers: The Big Business of Buying and Selling Predictions*. Hoboken, NJ: Wiley.

Stokman, Frans and Robert Thomson. 2004. "Winners and Losers in the European Union." *European Union Politics* 5/1:5-23.

Thompson, Robert, Stokman, Frans N., Achen, Christopher H. and König, Thomas. 2006.*The European Union Decides*, Cambridge University Press.

Wolfers, Justin/Zitzewitz, Eric. 2004a. "Prediction Markets." *Journal of Economic Perspectives* 18/2:107-126.

Wolfers, Justin; Zitzewitz, Eric. 2004b. „Using Markets to Inform Policy: The Case of the Iraq War." Unpublished, Wharton School and Stanford University.
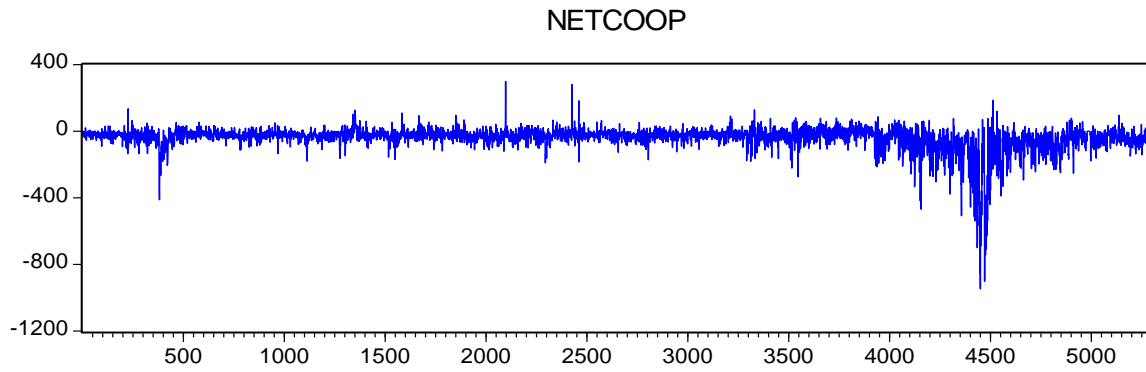
Figures and Tables

Figure 1: Ideal types of political forecasts with information from individuals

	Purpose of Forecast	
	Prediction of development	Prediction of single event
„Few" individuals	*Delphi method*	*Game and decision theoretic forecasts*
„Many" individuals	*Financial markets*	*Opinion polls/ Prediction markets*

Source of information

Figure 2:   Development the conflict and cooperation in the Levant and the Tel Aviv

Stock

Exchange, January 1, 1990 to June 30, 2004

2-A: Net daily co-operation (Goldstein scores)
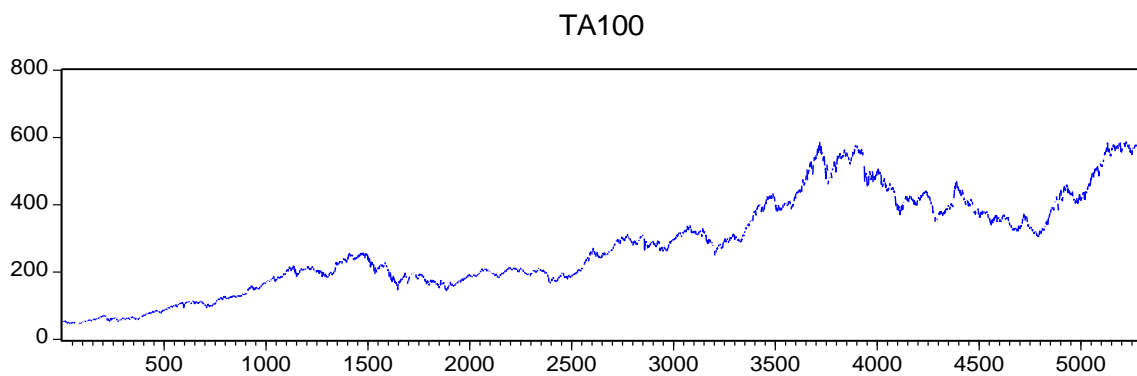
NETCOOP

2-B: TA100

TA100

Table 1: The impact of the lagged stock market exchange on conflict between Israel and the

Palestinians, January 5 1990 to June 25, 2004 (ARMA (1,0,0) and

EGarch (1, 1) models)

Dependent variable	*Conflict*	*Conflict*	*Conflict*	*Conflict*	*Cooperation*	*Cooperation*	*Cooperation*	*Cooperation*
Model	Full AR Model	Reduced AR Model	Full EGARCH model	Reduced EGARCH Model	Full ARMA model	Reduced ARMA model	Full EGARCH model	Reduced EGARCH model
Mean equation								
Constant	-66.63*** (6.83)	-66.66*** (5.68)	-74.90*** (1.43)	-74.90*** (1.43)	34.33*** (1.59)	34.35*** (1.59)	36.38*** (0.75)	36.07*** (0.77)
Diff(TA100) t-1	0.15 (0.17)		-0.08 (0.12)		0.17 (0.11)		0.32*** (0.09)	
AR (1)	0.83*** (0.003)	0.83*** (0.003)	0.78*** (0.02)	0.78*** (0.02)	0.64*** (0.007)	0.64*** (0.007)	0.71*** (0.02)	0.70*** (0.02)
Variance equation								
Constant			-0.82*** (0.29)	-0.82*** (0.29)			-1.89*** (0.44)	-2.02*** (0.45)
Bad day t-1			0.19*** (0.05)	0.19*** (0.05)			-0.12*** (0.03)	-0.11** (0.03)
δ_1			-0.57*** (0.03)	0.57*** (0.03)			0.47*** (0.03)	0.44*** (0.03)
δ_2			-0.10** (0.04)	0.95*** (0.04)			-0.11*** (0.03)	-0.09*** (0.03)
β			1.05*** (0.04)	0.88*** (0.03)			1.27*** (0.06)	1.27*** (0.06)
N	2550	2550	2550	2550	2550	2550	2550	2550
Log-likelihood	-13889.07	-13889.30	-1364.01	-1364.01	-12213.18	-12211.10	-12001.87	-12006.37
AIC	27786.13	27784.60	27312.02	27276.70	24434.36	24434.21	24019.73	24026.74
BIC	27809.51	27802.13	27358.78	27317.60	24457.74	24451.74	24066.49	24067.64

Note: ***, ** and * denote significance levels at 1%, 5% and 10%. Entries are parameter estimates and robust standard errors.

Table 2: Point Predictions of AR-Model and the Stock Market Model

Cooperative Event	Actual sum of co-ooperation	Prediction (Full ARMA Model)	Prediction (Reduced ARMA Model)	Prediction (Full EGARCH Model)	Predicted (Reduced EGARCH Model)
Madrid peace conference (30/10/91)	40.7	***29.9***	*28.4*	**35.9**	28.4
Secret Agreement in Oslo announced (30/8/93)[1]	51.5	31.01	*30.71*	**37.11**	***36.1***
Israel and PLO sign Oslo I agreement (13/9/93)	112.2	***45.0***	**45.9**	*34.5*	36.1
Israel and PLO sign "Gaza-Jericho First" agreement (4/5/94)[2]	59.5	***12.01***	**12.21**	*10.31*	10.9
Israeli and PLO negotiators in Taba achieve partial agreement (11/8/95)	64.9	49.7	*49.6*	**51.8**	***51.4***
"Summit of the Peacemakers" at Sharm el-Sheikh (13/3/96)	63.6	***30.5***	*30.0*	**31.2**	30.2
Israel and PA sign Wye River Memorandum (23/10/98)	120.3	68.4	*67.9*	**72.8**	***71.2***
Israel and the PA sign Sharm el-Sheikh Agreement (4/9/99)[3]	34.8	*28.9*	28.9	***36.4***	**36.1**
Camp David summit begins (11/7/00)	76.7	34.0	34.6	***35.1***	**36.1**
Camp David summit ends in failure (25/7/00)	52.3	***36.3***	36.3	**36.3**	*36.1*
Abbas to become first Palestinian Prime Minister (19/3/2003)[4]	28.1	50.6	*51.2*	**35.22**	***36.1***
Roadmap peace plan launched (30/4/2003)	120.4	***44.1***	*42.5*	**47.0**	43.7
Sharon orders a plan be drawn up to remove Gaza strip settlements (2/2/2004)[5]	37.8	35.2	*34.4*	**38.1**	***36.1***

Note: Best prediction in bold, second-best in bold and italics, worst in italics. The cooperative events listed in Schneider and Troeger (2006a) and in a BBC chronology on the Middle East conflict were used as sources.

[1] Actual and predicted values from 31/8/1993

[2] Actual and predicted values from 5/5/1994

[3] Actual and predicted values from 7/9/1999

[4] Actual and predicted values from 21/3/2003

[5] Actual and predicted values from 3/2/2004