



Exp–Wi–Fo Nachrichten

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Editorial

Liebe Kolleginnen und Kollegen,

nach einer recht langen Pause halten Sie wieder ein Exemplar der Exp–Wi–Fo Nachrichten/Nachrichten der Gesellschaft für Experimentelle Wirtschaftsforschung in Ihren Händen. Nachdem der Newsletter in den letzten Jahren zu großen Teilen von Herrn Professor Weber und Herrn Markus Nöth organisiert wurde, hat Herr Weber mich gebeten, den Newsletter fortzuführen. Am Konzept des Newsletters soll sich dadurch nichts ändern:

Nach wie vor lebt er von Ihren Beiträgen, Hinweisen auf Tagungen und Workshops etc. Wir wei-

sen gerne auf Ihr Arbeitspapier hin. Schicken Sie uns dazu bitte das Arbeitspapier inclusive Abstract zu.

Bitte senden Sie Hinweise, Beiträge etc. an die folgende email-Adresse:*

gew@sfb504.uni-mannheim.de

Den Newsletter gibt es jetzt auch elektronisch unter

<http://www.sfb504.uni-mannheim.de/~expwifo>

Ich wünsche Ihnen viel Freude bei der Lektüre,
Ihr Oliver Kirchkamp

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1 Konferenzen, Tagungen, Workshops

1.1 GEW-Workshop 1998 zur experimentellen Wirtschaftsforschung vom 12. 11. bis 14. 11. in Meißen

*Prof. Dr. M. Lehmann-Waffenschmidt**

Liebe GEW-Mitglieder und Interessierte, der Vorstand der GEW hat mich beauftragt, den nächsten Workshop der GEW zu organisieren. Da es u. a. wegen der Jahrestagung der Economic

Science Association (ESA) im Juni in Mannheim in diesem Jahr nicht sinnvoll erscheint, den bewährten Termin der GEW-Jahrestagung im Juli beizubehalten, möchte ich Sie im Namen der GEW schon jetzt herzlich zum Jahrestreffen der Gesellschaft für Experimentelle Wirtschaftsforschung vom 12. bis 14. November in Meißen (Evangelische Akademie) einladen. Damit das Tagungsprogramm des Jahrestreffens trotz der „Konkurrenz“ durch die Mannheimer ESA-Tagung attraktiv wird, möchte ich Sie bitten, nur Vortragsangebote zu Arbeiten zu ma-

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chen, die nicht auch bei der ESA-Tagung vorgetragen werden, und mir Ihre

Vortragsangebote bis zum 1. August

zukommen zu lassen. Darüber hinaus ist geplant, in das Programm der Jahrestagung Survey-Vorträge zu aktuellen Forschungsthemen aufzunehmen. Ich bitte Sie daher um Vorschläge für Survey-Vorträge zu aktuellen Forschungsthemen der experimentellen Wirtschaftsforschung bis zum 15. Mai.

Allen Mitgliedern und Interessierten werde ich Anfang September das Programm des Jahrestreffens und die Anmeldeunterlagen zusenden.

Ich würde mich über eine rege Teilnahme freuen, auch wenn der Tagungsort diesmal für die meisten von Ihnen etwas weiter entfernt liegt als in den letzten Jahren. Wir werden einen Steinwurf vom Meißner Dom und der Albrechtsburg entfernt in der renovierten Evangelischen Akademie tagen und wohnen, und ich bin sicher, daß außer dem Programm

des Jahrestreffens selbst auch der Tagungsort, das Ambiente von Meißen und die Nähe zu Dresden (ca. 30 min mit der S-Bahn) genug Anreiz bieten, den Weg auf sich zu nehmen. Wie in den vergangenen Jahren wird die GEW auch dieses Mal die Tagungsteilnahme ihrer Mitglieder bezuschussen.

Im Tagungsprogramm wird am Freitag abend (13. November) u. a. Zeit für den Besuch einer Vorstellung in der Semperoper vorgesehen sein. Da Vorstellungen der Semperoper im allgemeinen auf zehn Monate im voraus ausgebucht sind, aber das Programm für November bisher noch nicht veröffentlicht ist, biete ich Ihnen gerne an, über mich bis zum 1. April verbindlich Karten für diesen Aufführungsabend zu bestellen, an dem eine Oper, ein Ballett oder ein Konzert stattfinden kann. Bitte teilen Sie mir Ihre Preisobergrenze mit und welche dieser drei möglichen Kategorien Sie nicht wünschen.

Mit herzlichem Gruß

Prof. Dr. M. Lehmann-Waffenschmidt

1.2 Jahrestagung des Vereins für Socialpolitik vom 22. 9. bis 25. 9. 1998 in Rostock

Die Jahrestagung des Vereins für Socialpolitik findet vom 22. 9. bis zum 25. 9. 1998 in Rostock statt. Die Anmeldefrist für den offenen Tagungsteil ist am 1. 3. verstrichen. Interessenten, die die Tagung besuchen wollen, auch ohne ein Papier vorzutragen, finden weitere Information unter <http://www.vwl.uni-muenchen.de/verein/tagung.htm>. Die Kerntagung findet unter dem Thema „Die Zukunft des Sozialstaats“ mit Vorträgen von Dennis Snower (The Future of the Welfare State), Anthony B. At-

kinson (The Welfare State and Economic Performance), Gert Wagner (Zukunftsperspektiven der Alterssicherung), Friedrich Breyer (Zukunftsperspektiven der Gesundheitssicherung), Rüdiger Pohl (Der Konflikt zwischen tariflichen oder staatlichen Mindestlöhnen und der Sozialhilfe) und Bertram Schefold (Die Wirtschafts- und Sozialordnung der Bundesrepublik Deutschland im Spiegel der Jahrestagungen des Vereins für Socialpolitik 1949-1998) statt.

1.3 Annual Meeting der Economic Science Association vom 11. 6. bis 13. 6. 1998 in Mannheim

Das Annual Meeting der Economic Science Association findet vom 11. 6. bis zum 13. 6. 1998 in Mannheim statt. Bis zum Anmeldeschluß am 15. 2. sind 155 Beiträge eingereicht worden. 28% der Beiträge für ESA 98 wurden aus den USA eingereicht, 21% stammen aus Deutschland, 42% aus dem europäischen Ausland, und 9% aus Austra-

lien, Honkong, Israel, Kanada und Neuseeland. Interessenten, die die Tagung besuchen wollen, auch ohne ein Papier vorzutragen, können sich bis zum 1. Mai auf <http://www.esa.uni-mannheim.de/> anmelden. Neben den eingereichten Beiträgen wird es Vorträge von Reinhard Selten, Eric van Damme und Al Roth geben.

2 Heinz Sauermann-Preis zur Experimentellen Wirtschaftsforschung — 1997 bis 1999

Die Gesellschaft für Experimentelle Wirtschaftsforschung schreibt hiermit den „Heinz Sauermann-Preis zur Experimentellen Wirtschaftsforschung“ für die Jahre 1997 bis 1999 aus. Der Preis wird in zwei Kategorien vergeben und ist mit DM 2.500,- (Dissertationen und sonstige Forschungsarbeiten) bzw. DM 1.000,- (Diplomarbeiten) dotiert. Bewerber kann sich jeder bis zum Höchstalter von 35 Jahren, der in den Jahren 1997 bis 1999 (inkl.) an einer deutschsprachigen Hochschule eine herausragende wissenschaftliche Arbeit auf dem Gebiet der experimentellen Wirtschaftsforschung abgeschlossen hat. Über die Preisvergabe entscheidet der Vorstand der Gesellschaft. Der Rechtsweg ist ausgeschlossen. Die Arbeiten sind von einem verantwortlichen Hoch-

schullehrer mit einem Gutachten bis zum 31. 1. 2000 einzureichen bei der Gesellschaft für Experimentelle Wirtschaftsforschung; p. A. Professor Dr. Werner Güth (Vorsitzender); Institut für Wirtschaftstheorie; Humboldt-Universität zu Berlin; Spandauer Str. 1; 10178 Berlin

Für die Jahre 1995/96 wurde der Preis verliehen an:

- Herrn Dr. Fang Fang Tang, Bonn: „Anticipatory Learning in Two-Person Games: An Experimental Study“ (Dissertation)
- Herrn Dipl. Volkswirt Axel Ockenfels, Bonn: „Ein Experiment zum Solidaritätsverhalten“ (Diplomarbeit)

3 Abstracts

*On Saving, Updating and Dynamic Programming**

VITAL ANDERHUB, WERNER GÜTH, WOLFGANG HÄRDLE, WIELAND MÜLLER, MARTIN STROBEL

Abstract: If the future is uncertain, optimal saving decisions rely on anticipating optimal future behaviour as it is typical in dynamic programming. Our final goal is to outline a behavioural theory of saving behaviour. To develop a behavioural alternative to dynamic programming one needs stylised facts on saving behaviour in a stochastic environment requiring Bayesian updating. Our study concentrates on this first step by exploring certain important aspects of intertemporal consumption choices. Compared to previous experimental studies our experimental design is more complex since it relies on uncertainty on the number of future periods and on termination probabilities which have to be updated. We compare actual and optimal behaviour and explore certain aspects of boundedly rational behaviour.

An experimental study of saving, inflation and monetary policies in an overlapping generations model†

MICHELE BERNASCONI‡, OLIVER KIRCHKAMP§

Abstract: We study experiments of an overlapping generations model where agents may transfer wealth from one period to the next (saving) and

where government revenue is created through seigniorage. Inflation influences the amount of wealth an agent may wish to save in a given period. Inflation is determined by the monetary policy and by the amount of average saving within each period.

The framing of our experiment differs in several respects from the one that is used by Lim, Prescott, Sunder (1994), Marimon, Spear, Sunder (1993), Marimon, Sunder (1993,1994,1995). Some of the differences are: (1) the market is presented to subjects as a market operating in the EMU; (2) monetary policies have labels and participants vote on monetary policies; (3) participants describe their expectations graphically; (4) participants choose themselves whether they form expectations on inflation or on average savings; (5) participants can test the implication of several different expectations before making a saving decision.

Preliminary experiments show that: (1) in contrast to the literature (which uses a different frame), the so called Friedman conjecture holds, i.e. monetary policies which are equivalent in static equilibrium exhibit different inflation volatility in the experiment; (2) in contrast to the literature, agents do not form first order adaptive expectations; (3) participants learn during the experiment to think

* Paper available at J. Bönsch; Humboldt Universität Berlin; Wirtschaftstheorie III; Spandauer Str. 1; D-10178 Berlin.

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in terms of inflation rather than in terms of average saving.

We relate our findings to the current research on the theories of coordination and equilibrium selection.

*Decentralised versus collective bargaining — A theoretical and experimental analysis**

S. BERNINGHAUS, W. GÜTH, R. LECHLER, H.-J. RAMSER

Abstract: Two parties X and Y can either bargain separately with a third party Z or merge into XY and bargain collectively with Z. Depending on the payoff implications of the two possible contracts and on the asymmetry in the conflict payoffs of X and Y collective bargaining will increase, decrease, or leave constant what X and Y achieve together. In the experiment first X and Y vote for or against collective bargaining which then takes place in form of a modified demand game. Although participants react adequately to strategic aspects, their behaviour often does not depend on payoff parameters as predicted by the (Nash-)bargaining solution.

Trust in the shadow of the courts†

GEOFFREY BRENNAN, WERNER GÜTH, HARTMUT KLIEMT

Abstract: If contract enforcers must be randomly selected from the same population and thus are as opportunistic as ordinary traders could a system of adjudication nevertheless increase the degree to which contractual obligations on large anonymous markets are fulfilled? Adopting an indirect evolutionary approach with endogenous preference formation it can be shown that without superior behaviour of adjudicators an adjudication system can induce untrustworthy traders to behave as if trustworthy. However, in the presence of occasional mistakes adjudication will merely slow down but not fully eliminate the evolutionary advantage of untrustworthy types. Only if arbitrators become judges who receive a fixed income occasional mistakes will not favour untrustworthy types. But even then under non-optimal court politics and unfavourable parameter constellations in a low trust environment the introduction of courts may in fact contribute to the crowding out of the trustworthy.

Trust in the shadow of the courts if judges are no better‡

GEOFFREY BRENNAN, WERNER GÜTH, HARTMUT KLIEMT

Abstract: Can a court system conceivably control opportunistic behaviour if judges are selected from the same population as ordinary citizens and thus are no better than “the rest of us”? This paper provides a new and, as we claim, quite profound “rational choice” answer to that unsolved riddle. Adopting an indirect evolutionary approach with endogenous preference formation the complex interactions between “moral” intrinsic motivation to behave non-opportunistically and extrinsic “formal” controls of opportunism are analysed. Under the assumption that judges are no better than ordinary citizens it is shown that introducing a court system can nevertheless prevent that the more trustworthy are driven out. It cannot be excluded, though, that courts may themselves crowd out trustworthiness under certain circumstances.

Experimentelle Personalforschung

ROLF BRONNER§

Abstract: The paper tries to overcome the tense and on the first view contradictory relationship between human relation and experimental research by introducing experimental personnel research as a discipline. It aims at the development of a discussion base and the extraction of research questions to be considered. For the purpose of a classification the content as well as the epistemological and methodological principles of experimental personnel research are analysed. Experimental research can be described as a causal if-then-analysis generating practically relevant statements of middle scope at high measurement standards. In addition to the description and analysis of reality it is intended to shape the conditions of human behaviour in the sense of an improvement. Therefore the ethical dimensions of the research discipline are quite important for the examination of the variable variety, the possibility of generalisation, the transparency of the experiment and the intervention consequences.

Indirect Evolution versus Strategic Delegation — A Comparison of Two Approaches to Explaining Economic Institutions¶

MARTIN DUFWENBERG, WERNER GÜTH

Abstract: The two major methods of explaining

* Paper available at J. Bönisch; Humboldt Universität Berlin; Wirtschaftstheorie III; Spandauer Str. 1; D-10178 Berlin.

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economic institutions, namely by strategic choices or by (indirect) evolution, are compared for the case of a homogenous quadratic duopoly market. Sellers either can provide incentives for their agents to care for sales (amounts) or evolve as sellers who care for sales in addition to profits. Whereas strategic delegation does not change the market results as compared to the usual duopoly solution, indirect evolution causes a more competitive behaviour. Thus the case at hand suffices to demonstrate the difference between the two approaches in explaining economic institutions.

*A simple mechanism for the efficient provision of public goods — experimental evidence**

JOSEF FALKINGER, ERNST FEHR, SIMON GÄCHTER, RUDOLF WINTER-EBMER

Abstract: This paper presents an experimental examination of the Falkinger (1996) mechanism for overcoming the free-rider problem. The basic idea of the mechanism is that deviations from the mean contribution to the public good are taxed and subsidised. The mechanism has attractive properties because (i) it induces higher contributions to the public good and can implement an efficient level of contributions as a Nash equilibrium, (ii) the government budget is always balanced irrespective of the level of individual contributions, (iii) it is simple and policy makers need only little information to implement the mechanism.

To examine the empirical properties of the mechanism we conducted a large series of experiments. It turns out that the introduction of the mechanism generates immediate and large efficiency gains. This result is robust throughout many different experimental settings. Moreover, in the presence of the mechanism the Nash equilibrium is a rather good predictor of behaviour.

Keywords: public goods, efficient provision, voluntary contributions, experiments, mechanisms

JEL-Classification No.: H41, C91

Reciprocity and Economics — The Economic Implications of Homo Reciprocans†

ERNST FEHR, SIMON GÄCHTER

September 1997

Abstract: A large number of studies suggest that reciprocity constitutes a basic motivational drive. This paper shows that reciprocity can account for a wide range of empirical phenomena: It (1) is a powerful effort elicitation device, (2) explains why

employers refuse to hire underbidders and, hence, why wages are downwardly rigid, (3) gives rise to non-compensating wage differentials and to a positive correlation between profits and wages, (4) provides a rationale for the absence of explicit financial incentives, and (5) is a key force that sustains social norms.

Keywords: Reciprocity, fairness, involuntary unemployment, wage rigidity, wage differentials, social norms, norm enforcement

JEL-classification: C92, D64, J30, J50, J64

A Theory of Fairness, Competition, and Cooperation‡

ERNST FEHR§, KLAUS M. SCHMIDT¶

First Version: July 1997, This version: December 1997

Abstract: There is strong evidence that people exploit their bargaining power in competitive markets but not in bilateral bargaining situations? There also is strong evidence that people exploit free-riding opportunities in voluntary cooperation games. Yet, when they are given the opportunity to punish free-riders, stable cooperation is maintained although punishment is costly for those who punish. This paper asks whether there is a simple common principle that can explain this puzzling evidence. We show that if a fraction of the people exhibits inequality aversion the puzzles can be resolved.

Does Money Illusion Matter?

ERNST FEHR, JEAN-ROBERT TYRAN

Preliminary version, October 1997, Comments are welcome.

Abstract: Money illusion means that people behave differently when the same objective situation is represented in nominal or in real terms. To examine the behavioural impact of money illusion we studied the adjustment process of nominal prices after a fully anticipated negative nominal shock in an experimental setting with strategic complementarity. We show that seemingly innocuous differences in payoff presentation cause large behavioural differences. In particular, if the payoff information is presented to subjects in nominal terms, price stickiness and real effects are much more pronounced than when payoff information is presented in real terms. The driving force of differences in real outcomes is that subjects expect much more nominal inertia in

* <http://www.unizh.ch/iew/grp/fehr/paperdb/mech.pdf>

‡ <http://www.unizh.ch/iew/grp/fehr/paperdb/fairness.pdf>

† <http://www.unizh.ch/iew/grp/fehr/paperdb/homoreci.pdf>

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the nominal payoff condition. Due to strategic complementarity, these expectations induce subjects to adjust rather slowly to the shock.

Keywords: Money illusion, nominal inertia, sticky prices, non-neutrality of money

JEL: C92, E32, E52.

*Collective Action as a Social Exchange**

SIMON GÄCHTER, ERNST FEHR

June 1997

Abstract: Social interactions frequently are associated with social approval or disapproval. The anticipation of social rewards and punishments may have important economic consequences. It may affect the efficiency of team production and the decisions in diverse areas such tax evasion, the exploitation of the welfare state, criminal activity, union membership, and voting behaviour. Understanding the impact and the limitations of social rewards on people's behaviour is, therefore, of great interest.

Many of the above mentioned potential implications of social rewards and punishments involve collective action problems. Therefore, this paper examines whether the opportunity to exchange social approval for participation in collective actions is capable to overcome free-riding. For this purpose we identify how social approval is related to cooperation and free-riding. In particular, we find the following regularities: a) The less an individual engages in collective action the more disapproval the individual receives. b) A rise in the aggregate participation level of other group members imposes a negative approval externality on the individual, that is, he receives more disapproval. c) Approval gains, that is, the reduction of disapproval through increased cooperation, are positively correlated with the aggregate cooperation level of others. This indicates that approval incentives may give rise to low- as well as high-participation equilibria.

In addition to the examination of approval regularities we also analyse the behavioural impact of approval incentives. It turns out that among complete strangers approval incentives are not sufficiently strong to cause a reduction in free-riding. However, in combination with some minimal social familiarity approval incentives generate a significant rise in participation levels.

Equity Anchoring in Simple Bargaining Games With Production

ANITA GANTNER[†], WERNER GÜTH[‡], MANFRED KÖNIGSTEIN[§]

Abstract: In an experiment we investigate two simple bargaining games with advance production: the ultimatum game and a symmetric demand game. By choosing individual production levels two players determine the “pie” to be distributed afterwards. In these games it is not obvious what constitutes a fair allocation. We determine several equity standards and propose a behavioural model — “equity anchoring” — which generates testable predictions for the games studied and which is supported by the data. In contrast, game theory explains the observed decisions rather poorly.

On Competing Rewards Standards — An Experimental Study of Ultimatum Bargaining[¶]

URI GNEEZY, WERNER GÜTH

Abstract: In the tradition of earlier experimental studies, this paper introduces competing reward standards by letting parties bargain over the distribution of chips. The monetary equivalents of a chip for the bargaining parties can be equal (no competing rewards) or different (competing rewards). The ultimatum game is used as a tool to learn about reward standards in an asymmetric procedure. A major effect of different monetary chip equivalents is observed only when the proposer has a higher chip value. Results are compared to those reported in Kagel et al. (1996), who used a different experimental design.

Sequential versus independent commitment — An indirect evolutionary analysis of bargaining rules^{||}

WERNER GÜTH

Abstract: Rational bargaining behaviour depends crucially on the rules of bargaining, especially on whether parties decide sequentially or independently. Whereas in ultimatum bargaining the proposer can exploit the responder, independent commitments result in more balanced payoffs. To limit the scope of possible bargaining results we try to rule out certain bargaining rules. In our indirect evolutionary analysis we first determine the solution for all possible rule constellations and then derive the evolutionary stable rules of bargaining. It

* <http://www.unizh.ch/iew/grp/fehr/paperdb/collective.pdf> [†] University of California at Santa Barbara. [‡] Humboldt University at Berlin, Institute of Economic Theory III, Spandauerstr. 1, D 10178 Berlin. [§] Humboldt University at Berlin, Institute of Economic Theory III, Spandauerstr. 1, D 10178 Berlin. [¶] Paper available at J. Bönisch; Humboldt Universität Berlin; Wirtschaftstheorie III; Spandauer Str. 1; D-10178 Berlin. ^{||} ebd.

is shown that ultimatum bargaining requires considerable, but non-maximal uncertainty about the size of the pie, i.e. the monetary amount to be distributed.

*Specific Institutional Aspects of International Cooperation — A Game Theoretic Account**

WERNER GÜTH

Abstract: If one abstracts from specially organised markets like stock or commodity exchanges, (international) trade relies on bargaining between the interested parties. Whereas earlier the results of bargaining were seen as unpredictable or determined by an at most vaguely defined concept of (relative) bargaining power, it is simply a field of application in view of game theory. Our discussion tries to elaborate the specific institutional aspects of international bargaining with interacting parties from different countries. Especially, we concentrate on the problem when contracts resulting from international bargaining are unenforceable.

Negotiation rules and bargaining behaviour — What is known and what needs to be further explored?†

WERNER GÜTH

Abstract: We review and discuss the empirical support of the normative theory of bargaining which is an application of (non-) cooperative game theory and whose predictions depend on the rules of bargaining. Unfortunately, little is known about the rules of bargaining, i.e. there is a lack of empirical research concerning this type of institutional economics. An interesting, but hardly satisfactory alternative to such empirical research, namely to derive the rules of bargaining, is discussed with a help of a simple example. From empirical, mostly experimental results we draw some conclusions for the behavioural theory of bargaining.

Ultimatum Proposals — How Do Decisions Emerge?‡

WERNER GÜTH

Abstract: The basic idea of decision emergence is to generate the preferred decision alternative instead of assuming it as exogenously given like in neo-classical economics and game theory. The particular problem of ultimatum proposals has been selected in order to rely on experimental observations when speculating how choices emerge. Our approach distinguishes primary and secondary concerns of ultimatum proposers and illustrates how qualitative learning can (re)shape preferences over choices.

Boundedly Rational Decision Emergence — A General Perspective and Some Selective Illustrations§

WERNER GÜTH

Abstract: For a restricted class of decision problems a general framework is outlined specifying how boundedly rational decision makers generate their choices. Starting from a “Master Module” which keeps an inventory of previously successful and unsuccessful behavioural routines several submodules can be called forth which either allow to adjust behaviour quantitatively (by “Directional Learning” and “Adaptation Procedure”) or qualitatively (by “Cognitive Updating”), or to generate new decision routines (by applying “New Problem Solver”). Our admittedly bold attempt is validated by relating our theoretical constructs to some selective stylised experimental results.

Are rational cost expectations evolutionarily stable?¶

WERNER GÜTH

Abstract: On an a priori symmetric homogeneous duopoly market, where constant marginal costs are private information, the sellers can entertain arbitrary beliefs regarding the cost level of their competitor. In the tradition of the indirect evolutionary approach sellers behave rationally for given beliefs whose evolution is governed by the profits which they yield according to the true cost statistics. If beliefs are commonly known, rational cost expectations will not evolve whereas they always evolve when the market is competitive or when not only the cost levels, but also the beliefs concerning others’ cost levels are private information. More generally, rational cost expectations are only evolutionarily stable if own beliefs influence only own behaviour.

On the evolutionary stability of profit maximisation||

WERNER GÜTH, STEFFEN HUCK

Abstract: On a heterogeneous duopoly market sellers can maximise any (quadratic and concave) conjectural profit function. True profits, however, decide which conjectural beliefs become more frequent. There exists a manifold of neutrally stable conjectural profit functions. Whereas the true profit function is never stable as a conjectural one, an interesting stable constellation is when both duopolists consider themselves as monopolists what

* ebd. † ebd. ‡ ebd. § ebd. ¶ ebd. || ebd.

can be interpreted as a new justification of monopolistic competition. In general, the price effects of stable constellations depend on both, whether sellers believe the products to be substitutable or complimentary, and whether the products really are substitutable or not. By imposing limit evolutionary stability the manifold of neutrally stable conjectural profit functions collapses to just one of the neutrally stable constellations.

*The relevance of equal splits — On a behavioural discontinuity in ultimatum games**

WERNER GÜTH, STEFFEN HUCK, WIELAND MÜLLER

Abstract: The findings on the ultimatum game are considered as belonging to the most robust experimental results. In this paper we present a slightly altered version of the mini ultimatum game of Bolton and Zwick (1995). Whereas in the latter exactly equal splits were feasible in our games these were replaced by nearly equal splits favouring (slightly) the proposer in one version and the responder in a second version. Such a minor change should not matter if behaviour was robust. We found, however, a behavioural discontinuity in the sense that fair offers occur less often when equal splits are replaced by nearly equal splits. This has implications for theories incorporating fairness into economics.

An Experimental Study of a Dynamic Principal-Agent Relationship†

WERNER GÜTH, WOLFGANG KLOSE, MANFRED KÖNIGSTEIN, JOACHIM SCHWALBACH

Abstract: The principal-agent problem is often illustrated by the relationship between owners and managers in modern corporations. In this experimental study, we consider the problem where the owner has to motivate the manager by an employment contract which serves his interest. The contract consists of a fixed amount and an amount contingent on firms' profitability which depends on managers' effort and stochastic market events. The owner learns only about firms' profitability reported to him by the manager. This gives the manager discretionary power about distributable profits. The owner learns about dividends and may terminate or change the incentive contract in later periods. The experiment relies on a parameter specification for which risk neutral participants are expected to cooperate efficiently, i.e. the owner should design a contract rendering full effort as optimal. However,

we observe contracts for which full effort is not optimal and effort which does not qualify as optimal response. We find that trust and reciprocity are important features of subject behaviour which evolve within the principal-agent relationship, but are not carried over to the next game.

Towards a completely indirect evolutionary approach — A note‡

WERNER GÜTH, HARTMUT KLIEMT

Abstract: In previous work we adopted a standard indirect evolutionary approach in which phenotypical adaptation was brought about instantaneously by forward-looking fully rational choices. In this note we explore the possibility of substituting the assumption of instantaneous rational by that of gradual but "swift" myopic behavioural adaptation. To that end we sketch a two tiered evolutionary process characterised by the interaction of "fast behavioural" and "slow genetic" adaptation for a very simple game of trust.

Why the rich are nastier than the poor — A note on optimal punishment§

STEFFEN HUCK, WIELAND MUELLER

Abstract: Studying evolutionarily successful behaviour we show in a general framework that when individuals maximising payoff differentials invest resources in punishing others. Interestingly, these investments are increasing in individuals' own wealth and decreasing in the wealth of others.

On the reliability of reciprocal fairness — An experimental study¶

WERNER GÜTH, NADÉGE MARCHAND, JEAN-LOUIS RULLIERE

Abstract: Fairness has proved to be a robust phenomena in ultimatum bargaining, but it has to compete with other considerations. An effective mean to eliminate fairness has been role competition (Prasnikar and Roth, 1992). Our study explores whether after an initial phase of responder competition fairness will regain its influence. We compare two different groups of participants, those who previously experienced random respondership and those previously subjected to responder competition. All games involve one proposer and five potential responders.

* ebd. † ebd. ‡ ebd. § ebd. ¶ ebd.

*When will the fittest survive? — An indirect evolutionary analysis**

WERNER GÜTH, BEZALEL PELEG

Abstract: Survival of the fittest means that phenotypes behave as if they would maximise reproductive success. An indirect evolutionary analysis allows for stimuli which are not directly related to reproductive success although they affect behaviour. One first determines the solution for all possible constellations of stimuli and then the evolutionarily stable stimuli. Our general analysis confirms the special results of former studies that survival of the fittest in case of commonly known stimuli requires either that own success does not depend on other's behaviour or that other's behaviour is not influenced by own stimuli. When stimuli are private information one can derive similar necessary conditions for the survival of the fittest.

Information, Strategic Behaviour and Fairness in Ultimatum Bargaining — An Experimental Study

WERNER GÜTH[†], ERIC VAN DAMME[‡]

Revised, October 1997

Abstract: This paper reports on an experimental study of ultimatum bargaining situations in which an inactive third player is present. The proposer X suggests an allocation (x, y, z) on how to divide a cake between X, Y and Z . A message m that (partially) reveals this proposal is sent to the responder Y who has to accept or reject it. If Y accepts, each player gets paid as proposed, otherwise each player receives zero. In our experiments the three messages $m = (x, y, z)$, $m = y$, and $m = z$ were used. The information condition is common knowledge. The proposer's offer is seen to depend on the information condition. Specifically, the lower the information content of the message, the greedier the demand x of the proposer. In the case where $m = z$, the modal proposal allocates (almost) all of the cake to X . In the other cases, the responder receives slightly more than $1/3$ of the cake on average.

Measuring Treatment-Effects in Experimental Cross-Sectional Time Series

MANFRED KÖNIGSTEIN[§]

Abstract: If subjects interact with one another

and are observed repeatedly, some problems arise in measuring the effect of experimental treatments. The problems are characterised and solutions are suggested. Firstly, due to repeated measurement and strategic interaction, individual decisions may be correlated. It is suggested to consider the data as a panel with strategic interaction groups as units of analysis, and to use modelling to deal with repeated measurement. Secondly, in fixed effect regression analysis, the choice of identifying restrictions imposed on the fixed effect coefficients determines the interpretation of estimation results. A set of restrictions that seems useful for experimental purposes is suggested. Finally, in order to estimate such a model with OLS and to directly produce coefficients of interest, it is suggested to apply "nested effect coding" of matching group dummy variables.

Convergence to Equitable Play in the Repeated Ultimatum Game with Advance Production

MANFRED KÖNIGSTEIN[¶]

Abstract: Social justice is an important political issue. What is perceived as fair seems to depend on the relation between the distribution of social output and individual contributions to its production. The study reports empirical evidence for this view from an experiment, in which two subjects engage in joint production and can distribute the output via an ultimatum game. It is shown that, with experience, behaviour converges toward equitable play. A similar effect is induced by repeatedly facing the same opponent compared to one-shot interaction. In addition it is shown that equity perceptions are heterogeneous and that with experience, empirically successful equity concepts get even better, while empirically weak concepts, including game theory, get even worse.

Acquisition of Costly Information: An Experimental Study

TOBIAS F. ROETHELI^{||}

Abstract: I study decision making in a situation where subjects can buy information in order to uncover the initially unknown deterministic structure. The majority of subjects fail to find the most economical way of choosing between two possible prospects. Many subjects underestimate the value

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of information and, as a result, make avoidable forecasting errors. Other subjects learn correctly which action is most successful under any given condition but fail to implement this knowledge efficiently. They either accept errors for the sake of economizing on small amounts of information costs or they invest in redundant information. The resulting losses are substantial. Non-economists forego

40% of potential gains in situations they have repeatedly encountered. Economists perform better but still forego 10% of the possible gains. The experimental evidence further indicates that diffusing information freely as a public service can improve welfare and also questions the use of trial-and-error learning as a modeling device in economic theory.
JEL-Classification: C91, D83, H41