『国際開発研究フォーラム』27（2004. 8）
Forum of International Development Studies, 27（Aug. 2004）

Elements of Reverse Ultimatum Game in the Accession Negotiations between EU and CEE Countries:

A Case Study of Hungary

Hedvig ROZSNYOI*

Abstract

The Central and Eastern European countries (CEECs) - European Union accession negotiations have received a lot of attention during the last several years. The talks included numerous strategic considerations, for example time factors, bargaining processes, presence of power positions and psychological aspects. In order to analyze the negotiation strategies applied and to show the outcomes of them, the author utilized tools of experimental game theory. Using the "reverse" ultimatum game (RUG), time and other factors crucial to the results of the negotiation process were modeled. Evidence was found in the present case study of the agricultural negotiations between Hungary and the EU that these factors were used strategically to influence the outcome. The majority of the negotiatory events were observed just before the agreement, resembling the deadline effect of the reverse ultimatum game. It shows strategic use of time in favour of the EU. The power bargaining position was also captured in the behaviour of the EU by negotiating with the CEECs separately, which is similar to the multiple player version of the RUG.

Modification of this model, therefore, might serve as a good reference point to describe tendencies and key elements of the negotiating strategies of the EU authorities in the future.

Key words: experimental reverse ultimatum game, modeling, deadline effect, accession negotiations, European Union

I. Introduction

Ten Central and Eastern European countries (CEECs), now all linked to the European Union (EU) by the Association Agreement, completed the process of negotiations towards eventual membership in December 2002. Each of them became members of the Union on 1 May, 2004. However, these countries from the beginning of the process had to realize that negotiations with the EU followed rules that differed substantially from those known and applied in traditional diplomacy.

The goal of the present study was to explore this negotiating environment, the rules the EU and CEE candidates followed during the talks, and the negotiation strategies. The author shows evidence for strategic use of time and bilateral-type talks and also reveal their impact on the outcome of the

＊Doctoral Student, Gradnate School of International Development, Nagoya University E-mail: hedir@yahoo.com

negotiation process. For this purpose, the author demonstrates that an experimental game theory model of the reverse ultimatum game describes the rules of the negotiations and the consequences of the strategies followed by the players during the negotiations.

II. The negotiations

2.1. Outlook of the accession negotiations

After the fall of the Berlin Wall, during the 1990s the way the European Union dealt with 'Eastern enlargement' was considered rather ambiguous. Although the EU generally acknowledged from the beginning of the transformation process the strategic importance of the enlargement project in Central and Eastern Europe, still the Union followed an unclear approach in the details. No longer-term strategy was elaborated in the early years on how to strengthen stability and how to incorporate the Central and Eastern European countries into the framework of Western European integration. For most of this period, neither the date nor a clear timetable or the conditions of enlargement have been clarified. Under such conditions, the candidate countries faced the unique challenge of shaping their negotiation strategies at least after December 1995 (the Madrid Summit of the European Council) when the Commission of the EU gave its permission to start negotiations on accession with the candidates.

However, before the CEECs could reach this stage they had to face the EU legislation documents. This was the starting point for the negotiations, the Acquis Communautaire, a nearly 80,000-page body of Community policies that all applicants had to accept beforehand.

After accepting the Acquis, the "true negotiations" began, and the legislation was divided into thirty-one negotiation chapters, each of which covered a particular policy area. Some of the chapters caused few problems (e.g., science and research, education and training), since the relevant amount of EU legislation was rather limited or uncontroversial. However, other chapters were concluded or closed only at the last minute, since they touched upon core vested interests of current members and candidate states. For example, agricultural subsidies, budgets, financial issues, and structural funds fell into this most difficult category and involved the toughest conflicts. Such interests cover all issues affecting the normal functioning of the internal market and/or distortion of competition within the EU and candidate countries (Bomberg et al., 2003).

The sequencing of the negotiation chapters reflected the significance and potential 'weight' of a particular issue. Initially, the negotiations went quickly. The EU deliberately began negotiations on the least controversial chapters, such as research and development policy, hoping that momentum would build and facilitate agreement on the more difficult chapters, notably competition policy, agricultural policy, and structural policy. For instance, the Union could not afford to extend Common Agricultural Policy (CAP) and the structural funds to the much poorer and more rural East European countries. Yet CAP reform faced opposition from farmers in France in particular, and the poorer

member states as well (Smith 2004:109).

The accession of countries which are relatively poor and dependent upon agriculture will profoundly affect two major policies in particular: agriculture and cohesion policy. On average, agriculture represents 20 per cent of total employment in Central and Eastern Europe, more than four times as much as in the EU (Commission, 2001a). If all farmers were to receive the level of agricultural subsidies received by existing member states, the EU budget would collapse. Similarly, cohesion policy will be heavily affected. If existing eligibility criteria for structural funds were applied, virtually all regions in Central and Eastern Europe would be eligible, which would provoke protest from current recipients (Lykke, 2003).

In 1999, however, there were already signs that the pace of the talks was slowing, threatening the success of the entire negotiation process. In order to speed up again, in November 2000 the Commission of the EU proposed a 'roadmap' with a timetable for closing the remaining negotiating chapters with the most advanced countries, which was approved by the General Affairs Council on 4 December, 2000. The roadmap accelerated the process again, and although the real high-speed talks occurred only at the last moments just before closing the chapters, finally the EU and the CEECs succeeded in come to the agreement (Smith, 2004).

2.2. Some key points differing from the classic rules of negotiations

2.2.1. The official principles of the Accession Negotiations

The negotiations of classic rules start with the participants holding clear, different positions and end after several rounds in a compromise that satisfies all partners by containing some elements of the original position of each (Inotai, 2001:16).

However, the following principles determined by the Union in an official document (Ministerial Meeting for Opening the Intergovernmental Conference on the Accession of Hungary to the European Union - General EU Position, 26 March, 1998.) had to be taken into account in the course of the negotiations at all times.

Principles of the Accession Negotiations:

- The negotiations shall be conducted in a bilateral framework and the evaluation of applications for accession shall depend on the specific performance of the individual candidates.
- Requests for transitory measures shall be restricted both in terms of their period and content and shall contain a detailed action plan for the implementation of the relevant Acquis Communautaire.
- Requests for transitory measures may not contain modifications of the rules and policies of the Union, may not impede their ordinary operation, and may not significantly distort competition.
- The agreements -and partial agreements - achieved in the course of the negotiations shall be

conditional as long as there is no comprehensive agreement on all issues.

- The screening of chapters shall be reviewed as negotiations progress with respect to the Acquis created in the period between the commencement of accession negotiations and the moment of accession.

These rules for joining the EU differed from the classic rules. They had been defined by its present members and were not going to be rewritten as a result of the accession talks.

2.2.2. Rules to be accepted rather than negotiated

The starting point for the negotiations was therefore the Acquis Communautaire that all applicants had to accept beforehand. So the *rules (of the entire Acquis) had to be accepted, not negotiated*. Hence, the word 'negotiation' itself is misleading in the context of discussions about the accession.

The process of negotiation was confined to requests for temporary exemption from the prompt and full implementation of the Acquis. It included identifying the areas in which such requests should be made and the time-frame within which the candidate will implement the Acquis in full. The EU could ask for such exceptions, as well as the candidates (Inotai, 1998). The negotiations themselves were therefore about time and magnitude of temporary exemptions to the implementation of the rules of the Acquis and about how to interpret rules of the Acquis for a particular country. Such interpretation debates were about, for instance, which years should be regarded as base years for a particular quota that was important in defining how to calculate the quota itself.

2.2.3. Asymmetry in bargaining power

In other aspects, however, the negotiations took place between highly unequal parties. The EU was the policy-maker and each candidate country a policy-taker. The imbalance was exacerbated by the fact that the EU constitutes one of the world's most powerful economic groupings, while each applicant country was involved in the discussions individually. In other words, the EU never negotiated on the enlargement with a group of countries, even if several countries were negotiating at the same time.

Moreover, the EU had a far better overview and knowledge of the negotiation chapters than the applicants. Finally, the EU was empowered to have the last word on each applicant's fitness for membership. The EU's position in the negotiation 'game' was very powerful: it was not only a player and a referee, but was also allowed to play all its matches at home (Grabbe, 1998). Hence, the EU had been able to establish most of the ground rules, such as the stipulation that applicants must adopt the EU's entire Acquis or set of treaties and legislation. The applicant might obtain transition phases before it had to apply the EU rules, but permanent derogations or opt-outs were ruled out from the beginning (Sedelmeier et al., 2000).

The asymmetry of bargaining power between the EU and the CEECs put the EU very much in the driver's seat. A very good example was the Europe Agreement (EA) negotiations process opened in December 1990 with Poland, Hungary, and Czechoslovakia, which brought into sharp focus the gap between CEECs' expectations and concrete proposals from the EU. The dissatisfaction of the three governments from the CEECs led to two periods of deadlock, first in late March 1991 and again from July 1991, when notably the Polish delegation refused to send a high-level delegation to the negotiations. On each occasion the Commission successfully persuaded the Council to amend the negotiation directives in order to take better account of CEECs' demands. Despite some improvements on the original offer, the CEECs were still far from enthusiastic about the final outcome of the negotiations (Sedelmeier et al., 2000).

It is also important to underscore that the EU has closed the way for outright 'derogations' by any candidate country. This means that it is no longer possible to get permanent exemption(s) from any parts of the Acquis, and every recent applicant country finally had to adopt it fully. Such a behavior can also be regarded as a sign of power bargaining against the candidate countries since in the past, present member-countries were allowed such options. For example, Denmark and the United Kingdom stayed out of the social pact and several members also remained outside the Schengen Agreement (Inotai, 2001 and Grabbe, 2000).

2.2.4. Timing of presentation of position papers

The candidate country always had to put its position in a chapter on the table first, while the corresponding EU paper followed later. It was symptomatic that the EU had not put forward a position in some key chapters such as agriculture, financial transfers, and the budget for a long time. Therefore, negotiations on them could only be opened in virtual terms, by presenting the applicant's position, whereas the EU position arrived after a long intermission, delaying any in-depth discussions. Following the Nice Summit and the announcement of the first possible date of enlargement in 2004, all candidate countries wanted to meet this 'deadline' and seize the opportunity to become members of the Union, so accession negotiations was finally accelerating with more frequent negotiation events (Gyorkos et al., 2004).

Another aspect of the timing and the delaying strategy in the negotiations could be observed in the fact that candidates while formulating their position paper had to start out from a certain date when they believed they could become members of the EU. Since most of the requests for temporary exemption had to have a clear timetable, they were based on this hypothetical date of accession. If the date of accession was postponed, some of the exemption requests might become meaningless, which automatically led to changes in some temporarily closed chapters. Hungary, for instance, aimed originally for accession in 2002 and some requests for temporary exemption were phased accordingly. Since membership did not materialize before 2004, requests for the two-year period of 2002-3 (eg.,

extension of the telecommunications monopoly rights of MATAV until the end of 2002) had been overtaken by the events (Inotai, 2001).

2.2.5. Package deals

Another characteristic feature of the talks was the importance of compromise and package deals. Enlargement negotiations are almost always concluded with a package deal, with the EU and the applicant state swapping concessions across chapters (e.g., "I'll give in on agriculture if you give in on environment"). Especially in the 'end game' phase the EU had a clear tactical interest in tying the various negotiations together (Wallace et al., 2000).

2.2.6. Bilateral negotiation and group dynamics

Formally, accession negotiations were conducted bilaterally. Although the EU negotiated with individual applicants one at a time, the applicants were still treated as a group since they had to progress together and they would join the EU together on 1 May, 2004. The reasons for this kind of group dynamics were both practical and tactical.

First, the EU tends to take in new members in groups or 'waves' because it makes practical sense to do so. Enlargement implies that the newcomer will have to be represented in the EU's institutions and included in the EU's budget. Also, the EU prefers avoiding a constant process of internal reform that enlargement requires. Similarly, it is easier to deal with groups of countries that either share the same political and geographical background or have close economic relations.

A second reason for the group dynamic was tactical. The EU could use internal competition between the applicants to put pressure on specific applicants. For instance, the Commission published accession negotiation league tables, charting which applicant had closed negotiations in which area. This pressuring tactic was especially efficient in the 'end game', when the EU could play on the applicant's fear of being left behind in the 'queue'.

Group dynamics played a significant role in the CEECs' enlargement rounds. The EU headed towards a 'big-bang' idea where size of the group of the first six countries was increased up to a group of ten applicants joining the EU at the same time. The bigger the group, the more effective the group dynamics in determining who gets in and when (Lykke, 2003).

It is also important whether CEECs could find common negotiation positions and act as a group. Although some level of cooperation has been established- for example, there were regular meetings on different levels of government and public administrations, chief negotiators and experts regularly exchanged views, and cooperation among some countries had been indicated by regular half-year meetings- still the regrettable but inevitable reality was different. First, the EU has never prepared to carry out negotiations with any group of countries. In all cases in which more than one country wanted to join the integration, the negotiations themselves remained strictly bilateral, with separated

countries. Secondly, the EU always used its dominant bargaining power to improve its position to divide the candidates further in the emerging treaty. This was often achieved by finding the 'point of least resistance' among several candidate countries and coming to terms with it in a difficult chapter. Afterwards, all the other candidates were forced to accept this 'pattern' formulation. For instance, Hungary was the first to close the widely disputed chapter on the free flow of persons (labor). All the other candidates, if they wanted to have this chapter closed as well, had to accept the 'Hungarian' terms which served as a sample for them. To sum up, the candidate countries had very limited room for maneuvering during the negotiation period (Gyorkos et al., 2004).

2.2.7. The rules of the accession negotiation game

Summarizing the above mentioned key points specific for the negotiations, the author can describe the rules briefly as follows:

1. The EU had an amount of money to be shared and offered a proportion of this amount to the candidate countries (for example budgetary supports, agricultural quotas, etc.).
2. The EU had a power bargaining position.
3. The candidates had the right to accept or to reject the proposal in order to negotiate about a new offer.
4. The game contained strategic use of time factors, for example delaying the agreements untill the last minute.
5. The EU negotiated with the candidate countries bilaterally.
6. The game was based on ultimata (e.g. obligatory acceptance of the Acquis).

In order to model the negotiations using game theoretical approach and figure out the possible consequences, the author found a game with similar rules called the reverse ultimatum game.

III. The Reverse Ultimatum Game (RUG)

3.1. Rules of the RUG

Modeling of timing elements of the EU negotiation strategy was carried out by using the very recently developed and analyzed reverse ultimatum game (RUG) (Gneezy et al., 2003). The RUG involves a proposer and one or two responders. The proposer has a fixed amount and his task is to offer a share to the responder(s). After the proposer offers a given proportion of the fixed amount, the responder has the right to accept this offer or to reject it, showing his definite will to receive higher value. If the responder rejects the offer, the proposer has the choice to propose a higher proportion or to finish the game, in which case both of them receive nothing - giving the name "reverse" to this sort of ultimatum game. As Gneezy et al. (2003:349) wrote: "... The author calls the game a 'reverse'

ultimatum game because the responder's rejection of an offer is a form of reverse ultimatum which may be interpreted as meaning 'give me more or we will each get nothing', and because the subgame perfect equilibrium division between proposer and responder is the reverse of that in ultimatum game...". In addition, in the case of the two-responder game, the proposer always has the opportunity to change the bargaining from the first responder to the second one.

3.2. Theoretical approach of RUG

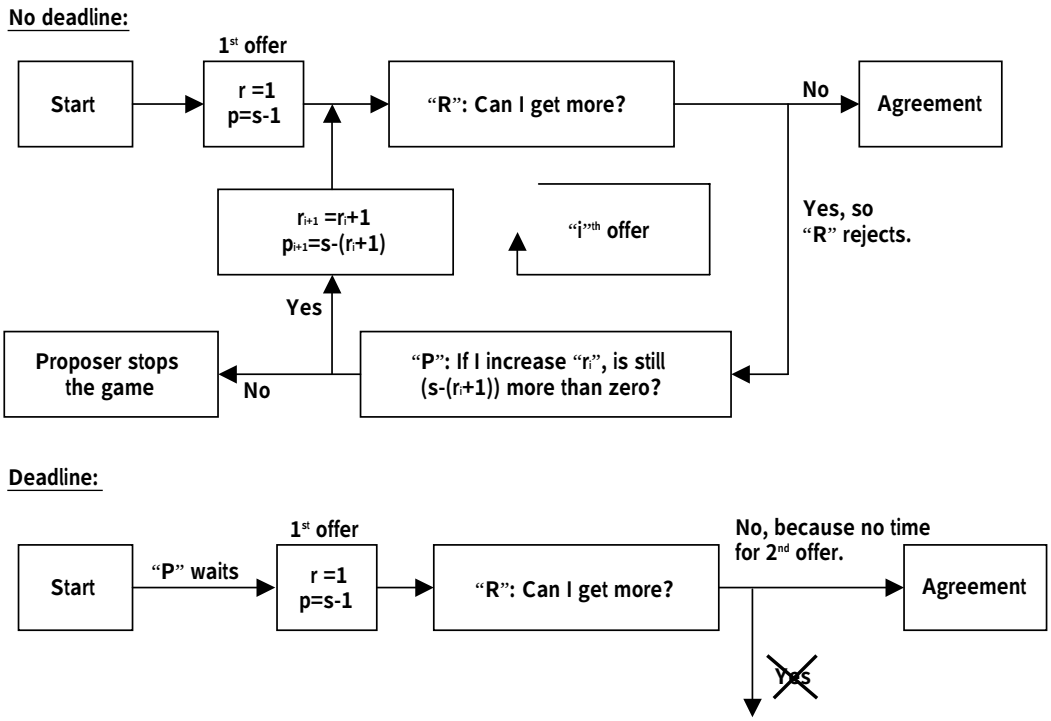
3.2.1. RUG without deadline[1]

Without deadline, theoretical consideration of the RUG predicted that the subgame perfect equilibrium would be reached at that situation when the responder receives almost the entire amount (Grosskopf and Roth, 2003). With infinite time (no deadline), the responder theoretically can wait and reject each proposal of the proposer until the proposer offers the highest proportion of the amount (Figure 1).

3.2.2. RUG with deadline

Strategic use of time factors is taken into consideration by introducing a deadline into the bargaining game. In contrast to the conventional ultimatum game where the subgame perfect equilibrium is invariant to the presence of deadline (Guth et al., 2001), analysis of the RUG showed importance of the time factor. Theoretical considerations of the RUG with deadline predicted that bargaining ended close to the deadline (Grosskopf and Roth, 2003) when the responder finally had no choice but to accept the offer of the proposer (Figure 1). The subgame perfect equilibrium can be calculated therefore for a situation when the proposer waits untill the last second just before the deadline to give a single offer to the responder. Since theoretical consideration supposes that the players care only for their own monetary payoffs, it is an obvious behavior of the proposer in that last moment to propose the lowest possible share to the responder, who must accept it otherwise he (the responder) gets nothing. Such a behavior results in the proposer getting almost the entire amount. Therefore, introducing a deadline into the game reverses the subgame perfect equilibrium, from the responder's advantage to the proposer's one - the second reason to name this a "reverse ultimatum game".

Figure 1 Flow chart of the RUG without and with deadline

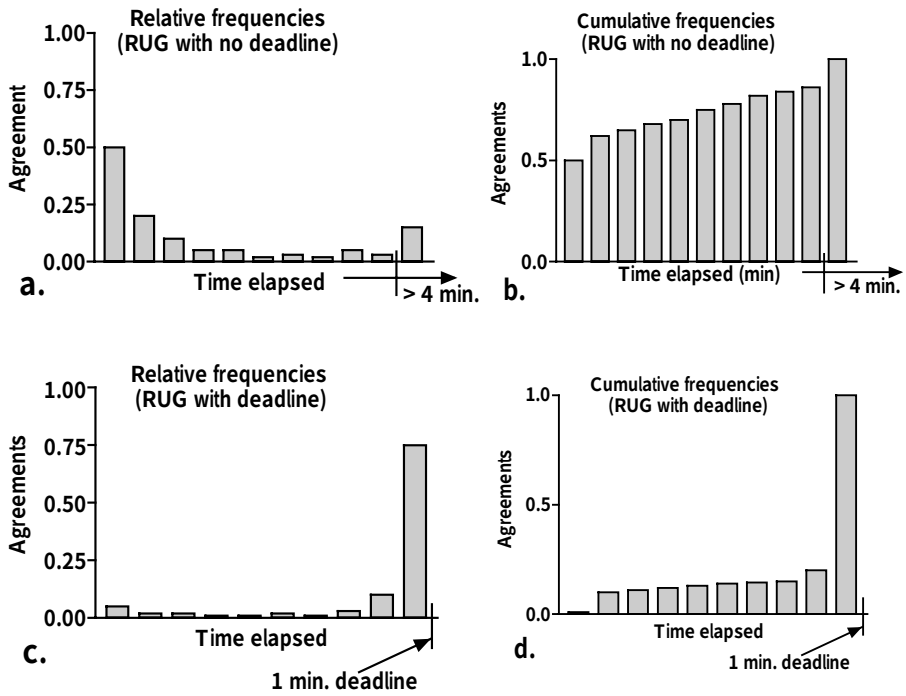


Note: *The mark "s" denotes for the total amount to be shared, "r" denotes the responder's share, "p" denotes the proposer's share, "R" denotes the responder and "P" denotes the proposer. Obviously, s=r+p.*
Source: *This flow chart has been created by the Author.*

3.3. Experimental approach of RUG

Experimental analysis of the RUG demonstrated a power bargaining position of the proposer, particularly in the strategic use of the time factor. As Gneezy et al., (2003:358) wrote: "... the agreements take place near the deadline not because of a need for time to reach the agreement but rather due to the strategic use of time to force a concession...". Delaying the agreement until near the deadline was therefore a significant point of the bargaining strategy of the proposer to gain as high a proportion of the fixed amount as possible. Literature on experimental dataset concerning the RUG reflects the differences in the course of the game with or without a deadline (Gneezy et al., 2003:347-368). As Figure 2 a-b show, without a deadline, the major proportion of the agreements was carried out at the beginning of the game. In contrast, when a deadline was introduced, the players agreed almost always near the deadline (Figure 2 c-d).

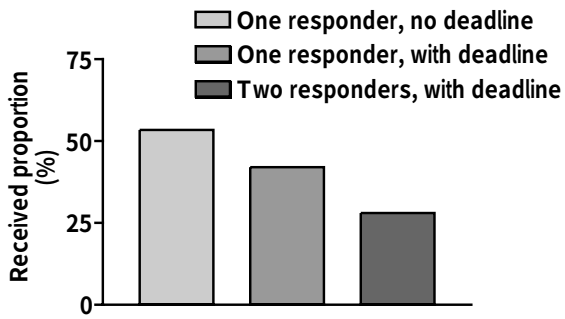
Figure 2 a-d Frequency distribution histograms of the agreements under "no deadline" and "deadline" conditions



Source: *The histograms were prepared by the author using data of Gneezy et al. (2003).*

In addition, the experimental results showed, that the proposer made quite a few offers before the deadline, also suggesting strategic use of the time factor in the game. Literature dataset also showed that another essential characteristic feature of the RUG was that introducing the deadline into the rules of the game resulted in a decrease of the proportion that the responder receives (Figure 3). Comparing the data of the RUG with and without deadline, the difference could be as high as 11.5 per cent of the entire amount (Gneezy et al., 2003:347-368).

Figure 3 Proportion of shares gained by the responder(s)



Source: *The graph was prepared by the author based on experimental dataset (Gneezy et al, 2003).*

Another essential element of the experimental analysis of the RUG was to show the effect of the two-responder game (Gneezy et al., 2003). In this form of the RUG, although the two responders know of the existence of each other, they are separated from each other. They are not allowed to communicate or to elaborate any common strategy against the proposer. In the case of two responders, the proposer is therefore able to exploit the opportunity to play the game with threat against the first responder: "If you do not accept my proposal, I will continue the bargaining with the other responder...". As Figure 3 shows, bringing the second responder into the game resulted in a drop of the percent at which the proposer agrees with the responder, regardless if it were the first or the second one. Compared with a one-responder RUG, the difference could be as high as 14 percent of the entire amount (Gneezy et al., 2003). Obviously, the RUG with two responders favors the proposer.

IV. Methods

4.1. Comparison of the theoretical and experimental approaches of the RUG

In order to model effects of time factors of the EU strategy during the accession negotiations, we used results of the experimental approach of the reverse ultimatum game (RUG). The reason for this choice is obvious if you compare the subgame perfect equilibrium, -calculated by the theoretical approach, and the experimental outcomes of the same game in circumstances providing a realistic bargaining environment in the laboratory. The theoretical considerations with a deadline condition predicted that the proposer (the EU) would receive almost the entire surplus under the rules of the RUG (Grosskopf and Roth, 2003). Similar theoretical results could be obtained in the ultimatum games with no "reverse ultimatum".

However, this large advantage gained by the proposer as predicted by the subgame perfect equilibrium turned out much lower when the RUG was examined in the laboratory (Gneezy et al., 2003). Experimental data demonstrated that instead of getting almost 100 percent of the surplus, the proposer received a lower proportion (28-53 percent, Figure 3) of it. Experimental analysis of the ultimatum games also showed a similar result: the proposer gained much closer to the half of the entire surplus. Therefore, although experimental data of the RUG revealed that in some circumstances (for example in the RUG with two responders) the proposer can still get high proportion (but much less than 100 percent) of the total amount, demonstrating the large advantage of the proposer, there are significant gaps between the theoretically predictable outcomes and the experimentally observed results.

Tendencies of both of the approaches might therefore show a beneficial outcome of the game for the proposer, but the experimental data describe events much closer to the real actions. The probable reason for this significant deviation is that the course of such a bargaining may contain numerous psychological factors (Bolton and Ockenfels, 2000; Fehr and Schmidt, 1999) which can together be taken into consideration in theoretical calculations only with considerable difficulties. Such

psychological phenomena, however, might be involved in the way of thinking of the individuals analyzed under the experimental conditions. Even psychological behavior not credible in theoretical considerations can occur under experimental conditions; for example, the proposer might sometimes carry out an implied threat to put pressure on the responder and hence affect the responder's behavior (Gneezy et al., 2003). The accession negotiations also contained numerous events influenced by psychological factors (including implied threats); therefore, it seemed reasonable to consider the experimental data of the RUG for modeling the strategies of the EU instead of that of the theoretical approach.

4.2. Collection of data

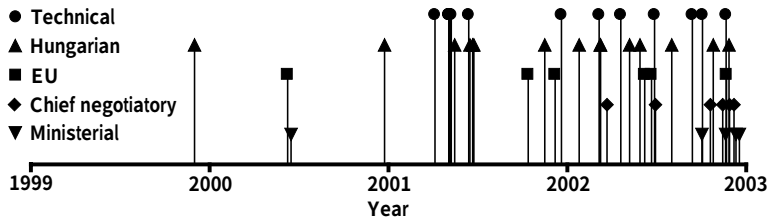
As a case study, the author used time data of the Hungarian-EU negotiations in the area of the agriculture for the time and frequency analysis. Although extensive general information concerning the accession negotiations can be found on different internet websites, the very detailed numerical data indispensable for the present game theoretical modeling cannot be obtained from these sources. Numerical data were therefore acquired by visiting chief officers of the Ministry of Foreign Affairs of the Republic of Hungary in Budapest and those of the Permanent Representation of Hungary to the European Union in Brussels. During these visits, personal interviews collecting non-numerical information were also done.

V. RUG Model Analysis of the Hungarian -EU Negotiations

5.1. Deadline-like effect in the negotiations

In order to find similarities between the deadline-effect observed in the RUG and the accession talks, the author used time data of the negotiations about the "Agriculture" chapter between Hungary and the EU. Analyzing these data and frequency of the negotiatory events, the author searched for signs of delaying that indicate strategic use of time factors.

Figure 4 Dates of negotiation events, including all kind of rounds and presentations

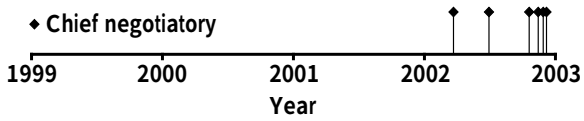


Source: *The graph was prepared by the author using data from The Permanent Representation of Hungary to the European Union.*

Figure 4 shows dates of the rounds, including technical rounds, presentation of the Hungarian and the EU positions, and rounds of the chief negotiatory and ministerial levels in the area of agricultural

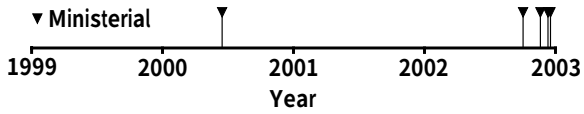
negotiation. Each vertical line represents one round or presentation of a position, and the different levels of these are presented with different labels. The time interval contains negotiatory events of four years from the beginning of 1999 to the end of 2002. A very characteristic feature of the graph is that although the start of the official negotiations was announced in 1998, there were very few events in the first two years. As time advanced, more negotiation rounds and positions could be found in the history of the negotiations. The large majority of the rounds were held in the last two years. This tendency is more prominent in the last year, as the value of frequency of the rounds became higher in 2002, especially in the second half of the year, just before closing the negotiations.

Figure 5 Dates of the chief negotiatory rounds of the agricultural chapter



Source: *The graph was prepared by the author using data from The Permanent Representation of Hungary to the European Union.*

Figure 6 Dates of the ministerial rounds of the agricultural chapter

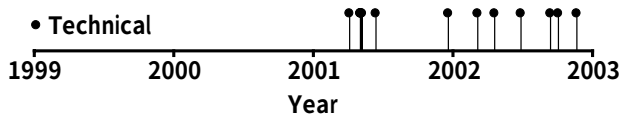


Source: *The graph was prepared by the author using data from The Permanent Representation of Hungary to the European Union.*

This phenomenon, at least partially, can be attributed to the ministerial and chief negotiatory rounds. As Figure 5 demonstrates, the chief negotiatory level of the negotiations was only held in the last year of the negotiations. In addition, Figure 6 shows that ministerial rounds were mostly in the last half of 2002 as well. The only official ministerial event held in the first half of the analyzed period was the opening of the agricultural negotiations. All the others were in the last months of 2002.

However, the above described contribution of the chief negotiatory and ministerial rounds to the phenomenon that frequency of the negotiation events increased with time is not the only reason of this feature. All the other levels of the negotiations show a similar character.

Figure 7 Dates of the negotiation rounds at the technical consultation level of the agricultural chapter

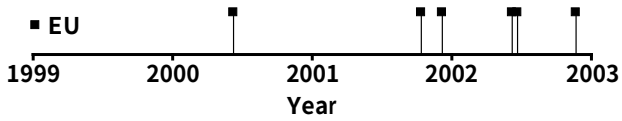


Source: *The graph was prepared by the author using data from The Permanent Representation of Hungary to the European Union.*

Surprisingly, technical rounds were only held in the second half of the four-year-long period. In addition, as Figure 7 shows, most of the rounds were during the last year of the negotiation,

demonstrating that the number of rounds held in a given time period became more concentrated as time advanced.

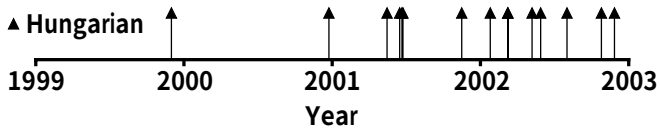
Figure 8 Dates of the EU positions in the agricultural chapter



Source: *The graph was prepared by the author using data from The Permanent Representation of Hungary to the European Union.*

Figure 8 reveals that in the field of agriculture only six EU positions were presented during the entire time of negotiations. Half of them were given to the Hungarian party during the last half year of the negotiations. This observation clearly shows that the EU positions also contributed to the increasing frequency of the negotiation events with advancing time.

Figure 9 Dates of the Hungarian positions of the agricultural chapter

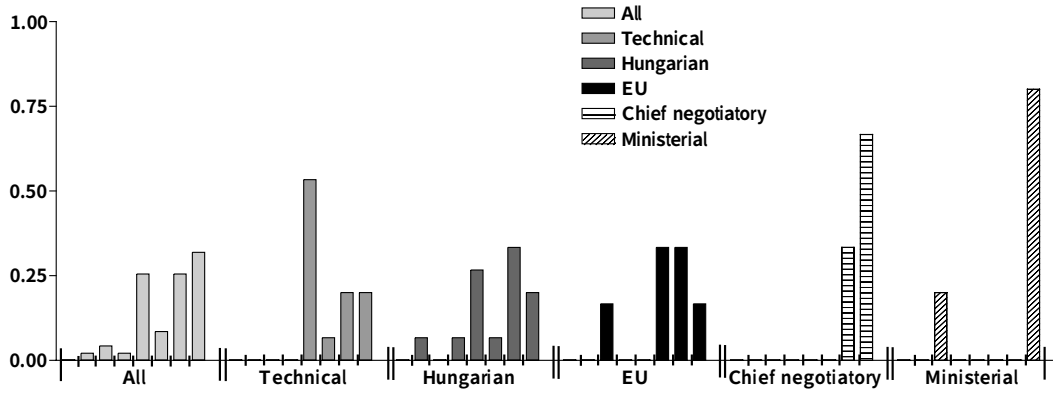


Source: *The graph was prepared by the author using data from The Permanent Representation of Hungary to the European Union.*

The vertical lines of Figure 9 represent Hungarian positions of the agricultural negotiations. One of the most obvious facts that can be observed in the figure is that the number of these positions is about double of that of the EU. In addition, the time difference between the dates of the Hungarian positions is more equidistant during the last year than in the earlier periods. Nevertheless, it is worth mentioning that a large majority of these positions were also presented in the second half of the entire negotiation period.

Some more information can be seen in Figure 10, where frequency distribution of the negotiation events is displayed. In the graph, all kinds of rounds or positions are presented, including all levels - Hungarian and EU positions, technical, chief negotiary, and ministerial. The relative frequencies were calculated by counting the appropriate events in every half year starting from the beginning of 1999 until the end of 2002. By comparing the relative frequencies of the half years, the graph shows that in the first two years a very small minority of the rounds were presented. This is obvious especially from the graph of the "All" containing all of the events. Nevertheless, there was a "boom" in the negotiation process in the first half of 2001, at least at the level of the technical rounds and the Hungarian positions. This can be attributed to the summit held in Nice (France) at the end of 2000 where the "roadmap" was implemented.

Figure 10 Frequency distribution of the dates of agricultural negotiation rounds (1999-2002, in every half year)



Note: *Statistical analyses, relative frequency distribution were calculated using the statistical package of the Prism 3.0 software. For frequency distribution calculations, the range of time data (from the beginning of 1999 to the end of 2002, totaling four years) was divided into half-year-long equidistant intervals, then it determined how many values fell into each interval. The fraction of values in each interval was determined for the relative frequencies, rather than the number of values in each interval.*

Source: *The graph was prepared by the author using data from The Permanent Representation of Hungary to the European Union.*

However, the process of the negotiations slowed down soon after the first enthusiastic six months and it accelerated again only during the last one year. Therefore, the graphs show that majority of the negotiation events was held in the last period, resembling the quick end of the reverse ultimatum game (see the steep slopes of Figure 2c-d) which has already demonstrated negative consequences of this scenario for the "responders".

Experimental analysis of the reverse ultimatum game demonstrated that if the majority of the bargaining events (proposals) were offered just before the time of agreement, it resulted in a decrease of the proportion the proposer would give to the responder. The figures presenting data of the rounds and positions of the different negotiation levels of the agriculture chapter and the one showing the frequency histograms revealed that similar phenomenon could be found in the accession negotiations. Although such an action was observed not only from the side of the EU but at all level of negotiations, including the Hungarian positions and the technical rounds, it results in the advantage of only one of the players of the game, namely the proposer. The positive effect of this behavior serves the EU, whereas the candidate countries ("the responders") experience the negative impacts of it. Strategic use of this time factor - the deadline effect - seems a very important moment in the negotiation process and the EU appeared to use it as much as possible in order to exhibit its power bargaining position.

Although in the accession negotiation it is difficult to define an exact deadline similar to that of the RUG, in addition to the frequency changes described above, still there were important factors that could finally be considered as resulting in a deadline-effect. Analysis of these factors could not be

bypassed, and the deadline rule of the RUG seemed a good model for it. The so-called "roadmap" (announced in the Summit of Nice in 1999 and published in the Enlargement Strategy Paper 2000) defines time periods by establishing which chapters they should finish in the given half-year periods. The other deadline-like aspect could be formulated in a single sentence: the longer the negotiation lasts, the higher the chance for the accession to fail (from interview with Dr. Peter Gyorkos, Director General for EU coordination, Secretary of the Interministerial Committee for European Coordination, Ministry of Foreign Affairs of the Republic of Hungary). This means that after some time elapsed with few results it was necessary to finish the negotiations soon or else the failure would have become a threatening reality. This rather psychological than physical deadline was also taken into consideration when we chose a game where the deadline is an important factor in the final outcome.

5.2. Presence of the two-responder game in the negotiations

In addition to the time factor represented by the deadline-effect, another important element of the EU strategy might be the two-responder game. As the experimental approach of the RUG demonstrated, introducing a second responder into the game moves the agreement in the proposer's favor. In case of two responders, the deadline-effect is more pronounced than in the one-responder game (Gneezy et al., 2003). The proportion that any of the responders (in the two-responders game) receives is much lower compared to that of the game played with one responder (see Figure 3.). Thus the EU did have the incentive to strive for the two-responder game. For instance, the EU had no intention to carry out negotiations with group of the candidate countries. As The Principles of the Accession Negotiations claimed, "... The negotiations shall be conducted in a bilateral framework...". In addition, the "big-bang" idea of the accession negotiations also might serve this aim, since the more countries join, the easier to play the two-responder game with countries separated. The RUG with two responders demonstrated that mainly the proposer enjoys beneficial consequences of this situation - and the proposer of the accession negotiations was the EU.

5.3. Analysis of the "payoffs" reached in the negotiations of the agriculture chapter

The other key element of the RUG to be analyzed was the set of the payoffs that is how much Hungary won during the negotiations. Presence of the deadline effect and the two-responder game influence the outcome. In order to further analyze effect of the strategic behavior of the EU the author therefore calculated percentage results of the negotiations in the agriculture chapter, using data of those transitory requests, which involved numerical values. "Requests of the Hungarian government" were chosen as basic values (100 %). These initial positions based on the starting positions of the Hungarian government as presented to the EU at the Conference on Accession to the European Union Hungary in Brussels, 1 February 1999 (CONF-H 4/99) titled "Negotiating position of the Government of the Republic of Hungary". "Results of the negotiations" based on the final values

Table 1. Numerical data of the negotiations of the agriculture chapter

		Requests of the Hungarian government	Results of the negotiations	Ratio of the Result/Request	Group of "Three priorities"	Group of "Animals"	Group of "Plants"	Group of "Plants+Base area+ref. yield"
Base area		3,628,298 ha	3,487,792 ha	96%				●
Reference yield		5.19 t/ha	4.73 t/ha	91%				●
Durum wheat	**Traditional area**	15,000 ha	2,500 ha	16%	●		●	●
	Well-est. (non-traditional) area	50,000 ha	4,305 ha	8%	●		●	●
Rice		18,000 ha	3,222 ha	18%			●	●
Tobacco		15,000 t/year	12,355 t/year	82%			●	●
Grain legumes		10,000 ha	1,954 ha	19%			●	●
Dried fodder		200,000 t	49,593 t	24%			●	●
Tomatoes for processing		321,442 t	130,790 t	40%			●	●
Beef	**Special premium**	245,000 heads	94,620 heads	38%	●	●		
	Suckler cow premium	300,000 heads	117,000 heads	39%	●	●		
	Slaughter premium	480,000 heads	235,000 heads	48%	●	●		
	Complementary payment	12,000,000 Euro	2,936,000 Euro	24%	●	●		
Milk	**Quota total**	2,800,000 t	1,947,280 t	69%	●			
	Deliveries	2,600,000 t	1,782,650 t	68%	●			
	Direct sales from farm	200,000 t	164,630 t	82%	●			
Sheep premium		1,500,000 heads	1,146,000 Euro	76%		●		
Goat premium		50,000 heads	No premium	0%		●		
Mean ± SD				**46.56±30.79 % N=18**	**43.56±25.50 % N=9**	**37.5±25.23 % N=6**	**29.57±25.11 % N=7**	**43.78±35.63 % N=9**
Percentage of the amount to be shared received by the responder in case of experimental approach of RUG of two responders and under deadline condition (Mean ± SD)				**33.8 ± 10.5 %; N=224**				
P value				**0.0981**	**0.2856**	**0.7347**	**0.6723**	**0.4259**
Is difference significant?				**NO**	**NO**	**NO**	**NO**	**NO**

Sources and Notes: *Conference on Accession to the European Union Hungary in Brussels, 1 February 1999 (CONF-H 4/99) titled "Negotiating position of the Government of the Republic of Hungary" and The Official Document of the Ministerial Meeting in Copenhagen, 12 December, 2002., The Mean ± SD data of RUG utilizes data of Gneezy et al., 2003. (p.352). P value=Probability of assumption that the "Mean" value of the group differs significantly from the "Mean" value of RUG. The significance level has been set to 95 %; N=number of observations, SD=Standard Deviation The Table has been created by the author.*

the Hungarian government and the EU agreed at the meeting in Copenhagen in 12 December, 2002. The numerical values contained quotas, supports, complementary payments and maximum guaranteed areas (Table 1.). The "proportion of shares" was calculated as percentage of the "Results" comparing to the "Requests". The author then grouped the values using different considerations (as signed with "●" for the 2nd, 3rd, 4th and 5th groups) and analyzed the statistical differences between the Mean values of the groups and that of the experimental approach of the RUG in case of two responders and under deadline condition.

The first group contains all of the percentage data. The second group involves the three priorities of the Hungarian government. These three priorities were the most important issues aimed by the Hungarian government (wheat, beef and milk). These issues represent the most hardcore topics of the Hungarian agriculture, involving traditional productions in the past centuries, the most favorable basic public food materials and therefore the highest public financial expectations regarding the domestic supports.

The third group was the animal-breeding (meat-producing) sector of the area of agriculture. The fourth group was the plant-production sector of agriculture. The fifth group was the plant-production sector together with the data of base area and reference yield.

Data of the experimental approach of the RUG in case of two responders and under deadline condition is also displayed in the Table 1. The Mean ± SD data represents the same value as the 3rd column of Figure 3., that is the proportion of share received by the responder.

Using the D-test of Kolmogorov-Smirnov for the normality we confirmed that all of the created groups have Gauss (normal) distribution. The F-test showed however that Variances of the data of the groups differed significantly from that of the RUG. Therefore, the author used two-tailed, unpaired Student's t-test with Welch-correction (to correct the t-test for the differing variances) to compare Means of each of the groups with Mean of RUG. Statistical analyses showed that there was no significant difference between any of the Means of groups and that of the RUG demonstrating that the "proportion of shares" of the Hungarian-EU agriculture negotiations did not differ significantly from the payoff predicted by the experimental outcomes of the RUG of two-responders and deadline condition. This result further supports the author's assumption that the experimental RUG could model the Hungarian-EU accession negotiations.

VI. Conclusions

It is suggested by the literature that the accession negotiations in the EU-CEECs context differed from the classic rules of traditional diplomacy in numerous features. The author's modeling is one of the first game theoretical works analyzing the key elements of this style of negotiation, which is new in the context of the EU-Hungarian accession talks. It focuses on the reverse ultimatum game played by multiple players and its time-related factors.

One of the most important goals of this study was to find similarities between a specific game and the accession negotiations in order to find an experimental game theory model to describe the strategic considerations of the EU. The RUG model could show some key elements of the EU-CEECs negotiations' rules. It could reveal power position of the EU in the accession negotiations and the author showed the consequences of the power bargaining strategy in the accession talks. It was demonstrated how the method of "speed-up only in the last period of the negotiations" and introduction of the "two-responder game" influenced the outcome. The model of the RUG showed that such effects might result in a serious decrease for the candidate countries in the financial outcome of the negotiations. Statistical analysis demonstrated that -under the present conditions used-, the data of experimental approach of RUG might describe magnitude of the payoffs reached by the end of the negotiation of the agriculture chapter, one of the "hardcore" issues. This game theory model demonstrated that the CEECs experienced some disadvantageous impacts on the final results under such conditions.

It is possible to find various reasons why the EU used time factors in its negotiatory behavior, e.g., delaying the agreements or speeding up the talks only near the "deadline". However, the author's paper does not intend to analyze the reasons. Rather, it focuses on the tendencies and the negative consequences of this behavior that the candidate CEECs experienced.

Applying the RUG model we can analyze the possibility of finishing the game by the EU. It exists in the rules of the game the author described in the first part of the author's paper, and the RUG also contains such a rule. However, it has no impact on the final result of the RUG, as the experimental analysis demonstrated (Gneezy et al., 2003). In the case of 225 RUG games played with two responders under deadline conditions, it never happened that the proposer finished the game significantly before the deadline. Therefore, such a rule seems only a theoretical possibility with no real influence on the results of the game.

The RUG is one of the latest inventions in the game theory. Therefore, at present there is no enough data to give an exact analysis of the limitations of it. However, some limitations can still be shown, considering some basic but not necessarily obvious factors. One of the limitations is related to the phenomenon, which can be described as separated but not independent negotiations. It means that although the EU negotiated with the CEECs in a strictly bilateral base, still the reached result with one country in a chapter influenced the result with the other countries. The negotiations were separated, however the results were dependent. Such a phenomenon could be traced between two countries by showing for example parallel time-dependency of the positions and results during the negotiations. The RUG could show such a phenomenon because time-dependency of the payoffs has already been demonstrated (Gneezy et al. 2003). However, according to the agreements between the EU and the CEECs, data of the position papers during the accession talks are not public, therefore at present such an analysis cannot be performed.

In addition to the above mentioned limitation, the recent form of the RUG cannot probably be used (or only with modification) if the two responders could see each other or the responders were allowed to communicate. The face-to-face version of the RUG might involve non-verbal communication, influencing the outcome of the game. Such a difference could also probably have been predicted in case the EU-CEECs accession negotiations if the CEECs had been able to generate common strategy (which would match to "the responders were allowed to communicate" in the RUG). In the example mentioned above, although tendencies might still be predicted using the present form of experimental RUG, magnitude of the payoff could probably be estimated with some error.

The importance of the present study consists in showing how the EU top level officials might use their negotiation strategy in the future. At present nobody knows how the EU will deal with the recently joining new members in the near future. If the powerful authorities of the EU do not decrease their power bargaining position against the new members, Hungary should be prepared to handle it. For this preparation Hungary could use the experiences of the recently closed accession talks, that is, experiences acquired from the analysis of the reverse ultimatum game.

The study also demonstrates the importance of the experimental reverse ultimatum game as an analytical tool to provide useful information in decision making processes. It is therefore indispensable to elaborate modifications of the RUG in the future, in order to develop strategic steps to be able to manage the potential threat of power bargaining behavior.

Acknowledgements

The author would like to thank Dr. Shigeru Otsubo (Vice Dean in the Department of International Development at Nagoya University, Nagoya, Japan) for his helpful advice and comments; Dr. Alvin L. Roth (Professor of Economics and Business Administration in the Department of Economics at Harvard University, and in the Harvard Business School, Boston, Massachusetts, USA) for providing the latest information about the RUG; Dr. Peter Gyorkos (Director General for EU coordination, Secretary of the Interministerial Committee for European Coordination, Ministry of Foreign Affairs of the Republic of Hungary, Budapest, Hungary) for the in-depth discussion; Dr. Andras Inotai (Director General of the Institute for World Economics of the Hungarian Academy of Sciences, Budapest, Hungary) and Dr. Norbert Potori (Head of the Department of Structural Policy, in the Research and Information Institute for Agricultural Economics, Budapest, Hungary) for their help and advice. The author greatly appreciates the contribution of Ms. Aniko Kormos (Head of Unit, Agriculture, Permanent Representation of Hungary to the European Union in Brussels, Belgium) for providing the very detailed information of the accession talks.

Notes

1 *Subgame* is a subset or piece of a sequential game beginning at some node (in the "tree"-representation of the

game) such that each player knows every action of the players that moved before him at every point. In this sense, a sequential game itself can also be considered as a kind of subgame.

In sequential games (in which players make at least some of their decisions at different times) with complete information, the strategy of a player may depend on the previous decision (step) of the other players. In this case the game has a Nash equilibrium. However, if the set of strategies is such that no player wants to modify his strategy *whatever* decision node (in the "tree" of the game) can be reached during the play of the game, an equilibrium set of strategies is called *subgame perfect*. Therefore, in case of the *subgame perfect equilibrium*, the strategy does not depend on the previous steps of other players in that particular subgame of the sequential game.

The subgame perfect equilibrium (SPE) of the theoretical approach of the RUG under *no deadline* condition can be shown as follows: Let's suppose the game with a proposer and a responder and let's suppose that the amount to be shared is 10 dollars. Both the proposer and the responder want the highest possible payoff. The proposer first proposes 1 dollar to the responder (and keeping 9 dollars for himself). The responder does not accept this offer, because he wants more money and he knows that the proposer must increase the offer, otherwise the proposer (and the responder, too) would receive zero. Since the proposer takes care only about his own monetary payoff (and even 1 dollar is more than zero dollar), he does not stop the game. He has no other choice but to increase and propose 2 dollars for the responder (and keeping 8 dollars for himself). Using the same logics as above, the responder rejects this offer, too. The time is infinite (no deadline), therefore the offer-reject cycle can continue until they reach the final offer of the proposer: 9 dollars for the responder and 1 dollar to keep, which proposal will be accepted by the responder. This extreme payoff is the outcome of SPE of this particular game. Introducing the second responder in the game does not change the proposer's payoff predicted by the SPE because if the proposer changes from the first responder to the second one still there is infinite time to play the offer-reject cycle until the proposer has only 1 dollar to keep for himself.

The SPE of the RUG under *deadline* condition is however the opposite to the SPE under *no deadline*. The best strategies in case of deadline are as follows: The proposer waits with his very first offer (1 dollar for the responder and 9 dollars to keep) until deadline is extremely close. Just before deadline (for example 5 seconds before it) he offers this proposal. The responder also takes care about his own monetary payoff, therefore he must accept this offer because there is no more time for a second offer. Hence, the game finished with an extreme payoff: 1 dollar for the responder and 9 dollars for the proposer to keep. Introducing the second responder does not change the proposer's payoff predicted by the SPE because it does not matter if he waits until the deadline and offers 1 dollar to the first or to the second responder just in the very last moment.

References

Bolton, G. and Ockenfels, A. 2000. ERC: A theory of equity, reciprocity and competition. *American Economic Review*. 90: 166-193.

Bomberg E. and Stubb A. 2003. *The European Union: How does it work?*. New York: Oxford University Press.

Commission. 1993. *Commission Communication: An Open and Structured Dialogue between the Commission and Special Interest Groups*. Brussels.

Commission. 1998a. *DGVI, Agricultural situation and perspectives in the Central and East European Countries*. Brussels.

Commission. 1998b. *Report on the progress toward Accession by each of the candidate countries*. Composite Paper. Brussels.

Commission. 2000. *Enlargement Strategy Paper: Report on Progress Towards Accession by Each of the Candidate Countries*. Brussels.

Commission. 2001a. *European Union and Enlargement: Fact Sheet, Directorate -General for Agriculture. Brussels*.

Commission. 2001b. *Making a Success of Enlargement: Strategy Paper 2001 and Report of the European Commission on the Progress Towards Accession by Each of the Candidate Countries*. Brussels.

Commission. 2002a. *General Budget of the European Union for the Financial Year* Luxemburg.

Commission. 2002b. *Toward the Enlarged Union: Strategy Paper and Report on the Progress towards Accession by Each of the Candidate countries. Brussels*.

The European Council. 2002. *Enlargement Report of the Council of the European Union to the European Council in Copenhagen*. Brussels.

Fehr, E. and Schmidt, K. A. 1999. Theory of fairness, competition and cooperation. *Quart J Econ*. 114: 817-868.

Gneezy, U., Haruvy, E. and Roth, A. L. 2003. Bargaining under a deadline: evidence from the reverse ultimatum game. *Games and Economic Behavior*. 45: 347-368.

Grabbe, H. 1998. A Partnership for Accession? The Implications for EU Conditionality for the Central and Eastern European Applicants. *Robert Schuman Centre Working Paper*, No.12. Florence: European University Institute.

Grabbe, H. 2000. The Sharp Edges of Europe: Extending Schengen Eastwards. *International Affairs*. 76 (3).

Grosskopf, B. and Roth, A. L. 2003. If You are Offered the Right of First Refusal, Should you Accept? - An Investigation of Contract Design. *Harvard Working Paper*.

Guth, W., Levati, M. V. and Maciejovsky, B. 2001. Deadline effects in ultimatum bargaining: An experimental study of concession sniping with low or no costs of delay. *Working Paper*. Max Planck Institute.

Gyorkos, P. and Kormos, A. 2004. personal interviews *Briefing Note: The Hungarian Deal for Enlargement: texts, and documents*. Budapest.

Inotai, A. 1998. *The CEECs: From the Association to Full Membership*. In Redmond, J. and Rosenthal, G. (eds.), *The Expanding European Union, Past, Present, Future*. Boulder, CO: Lynne Rienner.

Inotai, A. 2001. Some Key Issues in Understanding the Negotiations on Accession to the European Union. *Working Paper of Institute for World Economics, Hungarian Academy of Sciences*. 122: 1-26.

Lykke, F. 2003. EU Enlargement...And Then There Were 28?. In Bomberg, E. and Stubb, A. 2003. *The European Union: How does it work?*. New York: Oxford University Press.

Ministerial Meeting for Opening the Intergovernmental Conference on the Accession of Hungary to the European Union - General EU Position, 26 March, 1998.

Ministry of Foreign Affairs of the Hungarian Republic. 1999. *Negotiation Positions of the Government of the Republic of Hungary*. Budapest. No.: CONF-H 4/99.

Rozsnyoi, H., 2003. *The Impact of Eastern Enlargement of EU - A Case Study of Hungarian Agriculture Sector in The Presence and Future of Market Economies in Transition* by Imai et. al., Tokyo: Sairyuusha Press.

Sedelmeier U. and Wallace, H. 2000. *Eastern Enlargement in Policy-making in the European Union* by Hellen Wallace and William Wallace. New York: Oxford University Press.

Smith, K.E., 2004. *The Making of EU Foreign Policy: The Case of Eastern Europe*. New York: PALGRATHE AUTHOR MACMILLAN,.

Szucs, T. 2003. *Hungarian Mission to the European Union* (and negotiator in Copenhagen) *to UACES conference on enlargement*, 4 April 2003, King's College, London.

Wallace H. and Wallace W. 2000. *Policy-Making in the European Union*. New York: Oxford University Press.