Strategic Aspects of the 1995 and 2004 EU Enlargements*

László Á. Kóczy†

Abstract

While the 1995 entrants to the EU are by now fully integrated, those joining in 2004 still "enjoy" a secondary status for a number of years. We attribute this difference to the fact that unlike the former EFTA members joining in 1995, the 2004 entrants formed a group with heterogenous interests, one that lacked the same strong internal economic ties. Not being able to act as a unified block they had a considerably weaker bargaining position. We support our arguments by qualitative results from a simple model, a dynamic partition function game based on Yi (1997) and Morelli and Penelle (1997).

Keywords: European integration, externalities, path dependence

*I thank my promotor, Luc Lauwers, Massimo Morelli and two anonymous referees whose comments have significantly improved the paper. The support of the Catholic University Leuven, the Netherlands Foundation for Scientific Research (NWO), the Hungarian Fund for Scientific Research (OTKA NF-72610) is gratefully acknowledged.

†Department of Economics, Maastricht University and Keleti Faculty of Economics, Budapest Tech, Tavaszmező 15–17., H-1084 Budapest, Hungary. Tel: +36-16665204, fax: +36-16665209, email: koczy.laszlo@kgk.bmf.hu.

1 Introduction

The post-World War II division of Europe was soon mirrored in the European trading blocks: the Council for Mutual Economic Assistance (or Comecon), the Marshall Plan growing to become the predecessor of the European Union and the looser European Free Trade Association, but not for long. First, we saw a migration of members from the EFTA to the European Economic Community, then the former Comecon members sought entry and most of them have already joined the EU.

The 1995 and 2004 extensions of the EU have been remarkably different. The accession of Austria, Finland and Sweden is without doubt a success despite the fact that trade was already so open that there was not much to gain, except perhaps in the case of Finland, who had a rather restrictive agricultural policy (Flam, 1995). On the other hand, the feelings about the 2004 expansion are mixed (Rohrschneider and Whitefield, 2006): The enlargement was much delayed, required a number of concessions and it will be several years before the new entrants can enjoy the same status as former members: we can cite here both the Agenda 2000 agreements (Widgrén, 2006) on limiting the new entrants' budget receipts and the restrictions on labour mobility. One feels that Schuman's original ideas "about the equity between all countries" suffered an injury. This is no doubt partly due to the unprecedented differences between entrants and old members, the cost of the expansion, the entrants' poor economic performance and lack of political maturity. In this paper we look at the differences in *bargaining position*, discussing both possibilities and the actual actions taken, using a game theoretic approach.

Our model is based on a game in a per member partition function form

(Thrall and Lucas, 1963), a generalisation of the characteristic function form that accounts for externalities. Concerning the nature of these externalities we use three conditions expressed by Yi (1997). Finally, we consider a dynamic extension of this model (Seidmann and Winter, 1998; Gomes, 2005), where players can collect payoffs along the entire process (Morelli and Penelle, 1997; Konishi and Ray, 2003).

After the introduction of the notation, terminology and a historical overview we will discuss the *accession game*, where a number of applicants try seek entry to the Union, following an optimal *path* (Morelli and Penelle, 1997): a sequence of coalition structures that maximises the present value of payoffs.

2 Preliminaries

We consider a dynamic extension of a cooperative game with externalities where the payoffs are determined by a partition function (Thrall and Lucas, 1963). A partition function assigns a characteristic function to *each* partition; therefore the same coalition may have different payoffs in different partitions. Our focus is on the size of coalitions rather than on the distribution of coalitional payoffs so we consider a per-member partition function. Due to this symmetry all that matters is the partition of players and the *size* of the coalition a player belongs to. The usual definitions simplify to the following:

Let n denote the number of players. A group of players is a coalition and is denoted by its size $m \leq n$. A *coalition structure* $\mathcal{P} = \{m_1, \ldots, m_k\}$ is a partition of n. $\Pi(m)$ collects partitions of m. The set $\Pi(n)$ will be denoted Π.

Definition 1 *The pair* (n, v) *is a* per-member partition game *if* n *is a number*

of players and v is a function that assigns to each player i belonging to coalition m embedded in partition $\mathcal{P}$ its payoff $v(m, \mathcal{P})$. Formally $v : \Pi \to (\mathbb{N} \to \mathbb{R})$.

Without loss of generality it is assumed that $v(m, \mathcal{P}) \geq 0$, and $v(m, \mathcal{P}) = 0$ whenever $m \notin \mathcal{P}$, so $v(n, \mathcal{P}) > 0$ is only possible if $\mathcal{P} = \{N\}$.

Now we consider the dynamic extension of this model. Starting from an initial partition a group of players leaves its current coalitions and forms a new (sub)partition, the new partition becomes the status quo and the process continues. Players collect payoffs during the entire process, these payoffs are aggregated by discounting using a common *discount factor* $0 \leq \delta < 1$. Players are *fore*sighted, maximise the present value of their future payoffs. This setup generalises the standard myopic and farsighted models (Chwe, 1994; Xue, 1997, 1998; Ray and Vohra, 1997) where payoff is only collected in the first/last period. As a result we are not only interested on the final outcome of the process, but also the *path* to get there (Morelli and Penelle, 1997).

Players are denoted by a pair $(m, \mathcal{P})$ consisting of their coalition m embedded in partition $\mathcal{P}$. If identical players end up in coalitions of different sizes, they are assigned by lotteries. Thus, symmetry is preserved in the dynamic game.

We call the sequence $\pi = \{\mathcal{P}_0, \mathcal{P}_1, \mathcal{P}_2, \dots\}$ a *path*. We will restrict our attention to paths satisfying $\mathcal{P}_{i+1} \in \Pi^f(\mathcal{P}_i)$, where $\Pi^f(\mathcal{P})$ denotes the set of feasible partitions as results of deviations from $\mathcal{P}$. Let $\mathcal{P}_t(\pi)$ denote the partition after playing the game t times along π.

Let $w(m, \pi)$ denote the expected present value (or simply: value) of a player of type $(m, \mathcal{P}_0(\pi))$ along π. A player can have many possible "careers" even along a single path: assuming that with probability p_i $(i = 1 \dots, k, \ \sum_i p_i = 1)$ this player becomes $(m_i, \mathcal{P}_1(\pi))$ and that $\pi' = \{\mathcal{P}_1(\pi), \mathcal{P}_2(\pi), \dots\}$, we have

$w(m,\pi) = v(m,\pi) + \delta \sum_i p_i w(m_i,\pi')$. We consider coalition-proof stationary perfect paths only (Bernheim et al., 1987; Morelli and Penelle, 1997). In the following we spell-out each of these properties:

Coalition-proof refers to the fact that the path π is stable against deviations by not only singletons, but also coalitions. The path is stationary in the sense that if $\mathcal{P}_h = \mathcal{P}_k$ then $\mathcal{P}_{h+1} = \mathcal{P}_{k+1}$, that is, in the same situation players will make the same choice. Finally, perfectness implies that subpaths of π must satisfy the same properties.

Paths are infinite, but can be given by a finite sequence:

$$\pi = \{\mathcal{P}_1, \mathcal{P}_2, \ldots, \mathcal{P}_h, \ldots, \mathcal{P}_{k-1}, \mathcal{P}_k\},$$

where $\mathcal{P}_k = \mathcal{P}_h$, while $\mathcal{P}_{k-1} \neq \mathcal{P}_i$ for all $i < k-1$, that is, the subpath $\{\mathcal{P}_h, \ldots, \mathcal{P}_{k-1}\}$ repeated forever. Consequently, one only needs to check a large, but finite set of possible paths. Kóczy (2002) and Konishi and Ray (2003) provide additional results on the properties of such paths.

2.1 Customs unions and externalities

The literature on the welfare effects of customs unions (Bond and Syropoulos, 1996; Syropoulos, 1999; Bond et al., 2004) tends to focus on the overall effects rather than those on the expanding Union, the entrants and potential entrants in the process. Exceptions include Kauppi and Widgrén (2007) studying the effect of enlargement on the budget and Yi (1996) who focuses on the individual players and established the following results on the nature of externalities in such games.

Condition 1 *$v(n_i,\mathcal{P}) > v(n_i,\mathcal{P}')$, where $n_i \in \mathcal{P} \cap \mathcal{P}'$ and $\mathcal{P}$ is a refinement*

of $\mathcal{P}'$. This expresses that mergers hurt those outside the merger.

Condition 2 *$v(n_j, \mathcal{P}) < v(k, \mathcal{P}')$, where $k = \sum_{i=1}^{j} n_i$*

1. *$\mathcal{P} = \mathcal{P}' \cup \{n_1, n_2, \ldots, n_j\} \setminus \{k\}$ for some partition $\mathcal{P}_0$ of $n - k$,*

2. *$n_i \geq n_j \quad \forall i$,*

that is, a merger with weakly larger coalitions is beneficial.

Condition 3 *$v(n_j, \mathcal{P}) < v(n_i + 1, \mathcal{P}')$, if $\mathcal{P}' = \mathcal{P} \setminus \{n_i, n_j\} \cup \{n_i + 1, n_j - 1\}$, $n_i \geq n_j$, that is, a member of a coalition is strictly better off by leaving the coalition and joining a weakly larger one.*

Condition 1 is the basis of the domino theory (Baldwin, 1995) and formalises that "non-member concerns about [customs union] formation are well-founded" (Richardson, 1999) confirming that non-EU members feel excluded from an increasing EU. Conditions 2 and 3 go further: joining a larger group is beneficial both for individuals and coalitions.[1]

3 European integration and its externalities

The Yalta Conference divided Europe into East and West. The threat of emerging Soviet superpower forced allies and enemies alike into cooperation in the West; for those in the Soviet area of influence the Council for Mutual Economic Assistance (Comecon) formed and non-participation was not an option. In the West an accelerated reconstruction started under the Marshall Plan. The two halves of Europe entered diverging paths of development.

[1] Bond et al. (2004, Proposition 5.) show that the formation of a free trade area that is too small with respect to the rest of the world can be welfare-reducing for its members. Their analysis, however, focuses on the formation of a single group.

3.1 Integration on the West

The cooperation under the Marshall Plan soon evolved into the European Coal and Steel Community (ECSC, in 1951), where the resources of war have been turned into vehicles of cooperation. As open conflicts of the cold war spared Europe, the ECSC had a steady development turning into the *European Economic Community* (EEC) of Belgium, France, Western Germany, Italy, Luxembourg and the Netherlands (1958). With the Maastricht Treaty (in 1992) the EC becomes the *European Union* (EU) in 1993. It shall not lead to confusion if we refer to all these as 'EU.'

Neutral countries, reluctant to join the EU, then consisting solely of NATO members felt increasingly excluded from European markets (cf. Condition 1, see also (Baldwin, 1995)). As a compensation the United Kingdom, Denmark, Norway, Sweden, Austria, Switzerland and Portugal formed a looser alliance, the *European Free Trade Association* (EFTA), in 1960 (Iceland joined later, in 1970, Finland in 1986 and Liechtenstein in 1991).

The EFTA has always been smaller than the EU and its members had poor access to the much larger markets of the "inner six." By Condition 3 it is not surprising that soon the United Kingdom and Denmark decided to leave the EFTA and join the EEC. The condition applies to all EFTAns, so has not the rest? Firstly observe that both the UK and Denmark are NATO members, moreover, the EU has started to formulate political goals as well and not all were in favour of a deeper integration. Norway is a special case: a NATO member, and has expressed interest in joining the EU already three times, but entry was voted down by national referenda.

Ireland was the first to join without being a NATO member, probably due

to its strong economic ties with the UK. Previously unaffiliated countries have chosen the EU almost unanimously: Greece (1981) and Spain (1986), while the EFTA could only get Finland, already allied with EFTA from 1961 and Liechtenstein, already a member via its ties with Switzerland. The EU gradually won over most EFTA members: Portugal (1986) and Austria, Finland and Sweden (1995) (Condition 3). It was likely that by 1995 all EFTA members would join. We have already discussed Norway's case above, the remaining EFTA countries Switzerland, Iceland and Liechtenstein are all very strongly tied with the EU. The first has a tradition of independence that it would like to keep as its banking industry might rely on it, the latter have conflicts with EU regulations on fishing and taxes, respectively.

3.2 Integration on the East

With the *Comecon* an unprecedented, centrally planned economic block formed in 1949 that sometimes allocated entire industries to certain countries. All this in the name of efficiency, but the lack of market mechanisms or expertise, the admission of developing countries, corruption, the resistance of the population all contributed to the gradual decline and the eventual disbandment in 1991. At this point members were free to choose their own ways, they inherited distorted economies and broken trading partners. While foreign investment could help the first problem quickly establishing trade relations with the West and each other (Condition 2) was necessary to overcome the second.

Hungary, Poland and Czechoslovakia (then: Czech Republic and Slovakia) have, since the start, been at the forefront of political and economic development in the former Eastern Block. Their common past and similar level of

development made them natural allies. Referring to their historical Visegrád summit in 1335 [2] these countries formed the *Visegrád Group* in 1991 aiming at a cooperation similar to the Benelux: members are individually too small to make an impact, the group with 60 million inhabitants is a strong player. This group focuses on deep rather than wide cooperation and therefore has not admitted additional members.

The Visegrád countries have also formed the *Central European Free Trade Agreement*, with Slovenia (1996), Romania (1997), Bulgaria (1999), and Croatia (2002), Macedonia (2006), the rest of the former Yugoslavia, Albania and Moldova (2007) joining later. The CEFTA has never had the ambition beyond being a vestibule to the EU and its importance has significantly declined when the founding members left to join the EU. (Cf. Condition 3) In 2006 –already without the founding members– the agreement was modified and currently covers little approximately the area of the former Yugoslavia (minus Slovenia, plus Albania and Moldova).

By the time the Comecon has collapsed the EFTA was a dwarf compared to the EU. The more open, welcoming nature of the EFTA lead to a number of bilateral agreements, but (by Condition 3) the EU was clearly preferred, and by 2004 the first waves of Eastern applicants have joined.

This extension was very different from previous ones, but the differences are not where most seek it: we have seen bigger extensions (in terms of population) and we have seen extensions with nearly as large differences in productivity. While in previous extensions substantial efforts have been made to reduce these

[2]The economic and political agreements between Kings Charles I of Hungary, John of Bohemia, Casimir III (the Great) of Poland, Margrave Charles of Moravia, etc. at the (then) Hungarian capital Visegrád included the creation of a trade route to bypass Vienna.

differences now –in EU terms– poor entrants could become net contributors. The new members had to accept major compromises, such as the aforementioned 4% rule on budget receipts or the restrictions of labour mobility.

By the mid-1990's the EU has become the dominant trading partner for most applicants. A repetitive use of Condition 1 shows that it was increasingly undesirable to stay outside this union. Focussing only on the economic motivations, the entrants of 2004 were much more ready to make concessions in exchange of the entry than applicants ever before (Baldwin, 1994, pp130-139).

4 The Accession Game

In the following we define the accession game, a special case of the game discussed above. A number of (singleton) applicant seek entry to a union, represented by a large coalition. We assume that the union *monotone increasing*: no player leaves it. This is an assumption to simplify our solution, but it is not unfounded: Despite an exit clause in the Maastricht Treaty and threats both to leave (France, 1965–66), and to expel, none of the joining members have left the EU (Greenland left in 1985 after it was granted home rule, though technically it has never joined, it became a member via Denmark.).

The focus of the solution is on the conflict between the union and the applicants. Each step of the game can be pictured as a bargaining procedure: If no membership offers are made by the union or the offers are not accepted the applicants repartition themselves to obtain the highest value without acceptance – we call this the *disagreement partition*. When the union makes its most preferred offer those addressed accept only if joining is beneficial, keeping in mind

that the applicants without an offer will play their disagreement partition.

Before we go to the general results, consider the following example.

$v(m,\mathcal{P})$	m			
$\mathcal{P}$	1	2	3	$\geq s$
$\mathcal{P}_6 = \{s+3\}$				4
$\mathcal{P}_5 = \{s+2,1\}$	0			5
$\mathcal{P}_4 = \{s+1,2\}$		2		6
$\mathcal{P}_3 = \{s+1,1,1\}$	1			7
$\mathcal{P}_2 = \{s,3\}$			3	3
$\mathcal{P}_1 = \{s,2,1\}$	1	4		4
$\mathcal{P}_0 = \{s,1,1,1\}$	2			5

Table 1: Payoffs of game G

Example Consider the game in Table 1. As the union does not break up, there is no need to consider partitions with smaller unions. We solve the game using backward induction.

No applicants: the solution is trivial, $w(s+3,\mathcal{P}_6) = 4/(1-\delta)$.

1 applicant: By monotonicity, $\Pi^f(\mathcal{P}_5) = \{\mathcal{P}_5, \mathcal{P}_6\}$. If a membership offer is not made or accepted, the *disagreement partition* is played and by stationarity the game stays at this partition for ever after. The applicants' payoff is 0 at $\mathcal{P}_5$ while the union gets $w(s+2,\mathcal{P}_5) = 5/(1-\delta)$. Since $w(s+2,\mathcal{P}_5) = 5/(1-\delta) > w(s+3,\mathcal{P}_6) = 4/(1-\delta)$ no offer is made and $w(1,\mathcal{P}_5) = 0$.

2 applicants: The disagreement partition is $\mathcal{P}_4$ giving $w(s+1,\mathcal{P}_4) = 6/(1-\delta)$ to the union. Since $\mathcal{P}_4 >_s \mathcal{P}_5 >_s \mathcal{P}_6$ the union does not make an offer.

3 applicants: We deal with $\mathcal{P}_0$ and $\mathcal{P}_2$ first. Although for the applicants $\mathcal{P}_2$

is no better than playing $\mathcal{P}_1$, it –credibly– gives the union a lower payoff. The disagreement partition is $\mathcal{P}_2$ with $w(3, \mathcal{P}_2) = 1/(1-\delta)$ and $w(s, \mathcal{P}_2) = 3/(1-\delta)$. This is the lowest possible payoff for the union. The applicants prefer $\mathcal{P}_6$ and hence this is played.

	Stage I	Stage II	Stage III	Stage IV
1	$\mathcal{P}_4 > \mathcal{P}_6 > \mathcal{P}_3 > \mathcal{P}_1 > \mathcal{P}_5$	$\mathcal{P}_4 > \mathcal{P}_3 > \mathcal{P}_1 > \mathcal{P}_5$	$\mathcal{P}_4 > \mathcal{P}_3 > \mathcal{P}_5$	$\mathcal{P}_4 > \mathcal{P}_3$
2	$\mathcal{P}_5 > \mathcal{P}_6 = \mathcal{P}_3 = \mathcal{P}_1 > \mathcal{P}_4$	$\mathcal{P}_5 > \mathcal{P}_3 > \mathcal{P}_1 = \mathcal{P}_4$	$\mathcal{P}_5 > \mathcal{P}_3 > \mathcal{P}_4$	$\mathcal{P}_3 > \mathcal{P}_4$
s	$\mathcal{P}_3 > \mathcal{P}_4 > \mathcal{P}_5 > \mathcal{P}_1 = \mathcal{P}_6$	$\mathcal{P}_3 > \mathcal{P}_4 > \mathcal{P}_5 > \mathcal{P}_1$	$\mathcal{P}_3 > \mathcal{P}_4 > \mathcal{P}_5$	$\mathcal{P}_3 > \mathcal{P}_4$

Table 2: Preference orderings for $\mathcal{P}_1$ in game G without transfers.

In partition $\mathcal{P}_1$ the applicants have inhomogeneous preferences. Since the pair does not want to merge with the singleton, the disagreement outcome is $\mathcal{P}_1$, giving $w(1, \mathcal{P}_1) = 1/(1-\delta), w(2, \mathcal{P}_1) = 4/(1-\delta), w(s, \mathcal{P}_1) = 4/(1-\delta)$. Table 2 summarises how preference orderings (marked " $>$ ") are evaluated. In stage I we remove the partitions that are worse than the disagreement partition for the union ($\mathcal{P}_6$). From here the partitions are eliminated from backwards. The last chance to improve payoffs before disagreement is $\mathcal{P}_5$. In stage II the pair is willing to accept this, so the "offer" $\mathcal{P}_1$ is never made. Foreseeing these actions, the singleton will accept the previous offer in stage III, $\mathcal{P}_4$, as it improves its payoff, and it can enforce it. This is the worst possible outcome for the pair, it is willing to accept the previous offer $\mathcal{P}_3$, and can enforce it, and hence this is the outcome for the game. The union exploited the tension among applicants very well: its first offer is accepted, for the applicants $\mathcal{P}_6$ Pareto-dominates this outcome. Table 3 summarises the calculations.

If we do allow transfers among applicants the singleton can compensate the

Game G	$\mathcal{P}$	m	π^*	w
0-applicants	$\mathcal{P}_6$	$s+3$	$\{\overline{\mathcal{P}_6}\}$	$4\frac{1}{1-\delta}$
1-applicant	$\mathcal{P}_5$	1	$\{\overline{\mathcal{P}_5}\}$	0
		$s+2$		$5\frac{1}{1-\delta}$
2-applicants	$\mathcal{P}_4$	2	$\{\overline{\mathcal{P}_4}\}$	$2\frac{1}{1-\delta}$
		$s+1$		$6\frac{1}{1-\delta}$
	$\mathcal{P}_3$	1	$\{\mathcal{P}_3, \overline{\mathcal{P}_4}\}$	$1+2\frac{\delta}{1-\delta}$
		$s+1$		$7+6\frac{\delta}{1-\delta}$
3-applicants	$\mathcal{P}_2$	3	$\{\mathcal{P}_2, \overline{\mathcal{P}_6}\}$	$3+4\frac{\delta}{1-\delta}$
		s		$3+4\frac{\delta}{1-\delta}$
	$\mathcal{P}_1$	1	$\{\mathcal{P}_1, \mathcal{P}_3, \overline{\mathcal{P}_4}\}$	$1+\delta+2\frac{\delta^2}{1-\delta}$
		2		$4\frac{1}{1-\delta}$
		s		$4+7\delta+6\frac{\delta^2}{1-\delta}$
	$\mathcal{P}_0$	1	$\{\mathcal{P}_0, \overline{\mathcal{P}_6}\}$	$2+4\frac{\delta}{1-\delta}$
		s		$5+4\frac{\delta}{1-\delta}$

Table 3: Values and optimal paths for game G.

2-coalition when moving to $\mathcal{P}_2$, and thus the partition offering the lowest value to the union becomes a credible threat, and $\mathcal{P}_6$ is played. Remarkably, transfers never take place, as the threat is never executed; as soon as the union believes that transfers *could* take place, a better outcome is achieved.

This –perhaps artificial– example perfectly illustrates the issues that can arise in extensions like the ones in 1995 or in 2004. The EU has no economic incentives to accept a single poor applicant[3]. The integration of several applicants *outside* the union results in negative externalities to the the union. These

[3]Single country extensions in the past have been more on political than economic grounds.

externalities are probably not severe in relative terms, but, as in this example, may just outweigh the cost of admitting new members.

This is also an example that satisfies Yi's conditions, but where the grand coalition does not necessarily form. This can be explained by the fact that we do not have an open membership game, that is, entry requires EU-permission and that we ignore countries that are neither members nor applicants.

4.1 The general form

In the general accession game we allow transfers among the applicants. Such a game even with an arbitrary number of applicants simplifies to a two-player game between the union S and the applicants, denoted A. At each partition $\mathcal{P}$, given the corresponding $\Pi^f(\mathcal{P})$ the next move is determined using backward induction: The case with no applicants is trivial. Given that for all games with less than k applicants the solution is found, we solve the game with k applicants.

Given $\mathcal{P}$ both the union and the applicants can calculate their value for each $\mathcal{P}' \in \Pi^f(\mathcal{P})$: If at least one of the applicants is admitted, we use the –known– solution of the game with the remaining applicants. If no offer is made, applicants choose the disagreement outcome and this is the end of the game, so the value is the present value of a constant payoff stream. Given these values the union will make offers as long as its value is beyond the disagreement value:

$$\mathcal{P}_D \in \arg \max_{\substack{\mathcal{P}' \in \Pi^f \\ s \in \mathcal{P}'}} \left\{ w^A(\mathcal{P}') \right\}$$

Applicants choose their most preferred offer; formally we have the solution:

$$\mathcal{P}^* = \arg \max_{\mathcal{P} \in \Pi^f(\mathcal{P}_0)} \left\{ w^A(\mathcal{P}) \,\middle|\, w^S(\mathcal{P}) > w^S(\mathcal{P}_D) \right\} \tag{1}$$

If offers are made by the applicants we get a similar formula, while if offers are

made simultaneously we get a bargaining problem.

Once these equilibrium offers are known, we solve for optimal *paths*, yet again, using backward induction. Let $\Pi^a = \{\mathcal{P} \in \Pi | \, n - s = a\}$ denote the set of partitions with exactly a applicants. For $a = 0$, $\Pi = \{\{n\}\}$ and the solution is trivial. When solving for a we assume that for all $\mathcal{P} \in \Pi^k$ with $0 \leq k < a$ the solution is known. Now let

$$\Pi_D^a = \arg\max_{\mathcal{P} \in \Pi^a} v^A(\mathcal{P}) \text{ the collection of disagreement outcomes,}$$

$$\Pi_+ = \left\{ \mathcal{P} \in \bigcup_{a=0}^{n-s_0} \Pi^a \,\middle|\, w^S(\mathcal{P}) > \min_{\mathcal{P}_D \in \Pi_D^a} w^S(\mathcal{P}_D) \right\} \text{ the set of offers,}$$

$$\mathcal{P}^a \in \arg\max_{\mathcal{P} \in \Pi_+} w^A(\mathcal{P}) \text{ the accepted offer in the case of } a \text{ applicants.}$$

Let $b \in \mathbb{N}$ such that $\mathcal{P}^a \in \Pi^b$, that is, $a - b$ applicants join under the accepted offer. Then starting from the initial partition $\mathcal{P} \in \Pi^a$ we have:

$$\pi^*(\mathcal{P}) = \begin{cases} \{\mathcal{P}, \mathcal{P}^a\} & \text{if } b = a \\ \{\mathcal{P}\} \cup \pi^*(\mathcal{P}^a) & \text{otherwise,} \end{cases} \tag{2a}$$

$$w^A(\mathcal{P}) = \begin{cases} v^A(\mathcal{P}) + \delta \frac{v^A(\mathcal{P}^a)}{1-\delta} & \text{if } b = a \\ v^A(\mathcal{P}) + \delta w^A(\mathcal{P}^a) & \text{otherwise,} \end{cases} \tag{2b}$$

$$w^S(\mathcal{P}) = \begin{cases} v^S(\mathcal{P}) + \delta \frac{v^S(\mathcal{P}^a)}{1-\delta} & \text{if } b = a \\ v^S(\mathcal{P}) + \delta w^S(\mathcal{P}^a) & \text{otherwise,} \end{cases} \tag{2c}$$

5 Conclusions

Baldwin (1994, pp130-139) describes the "hub-and-spoke bilateralism" model, where the European Union has arrangements with each applicant separately. In our model this corresponds to the union and a set of singletons. This setup is

favourable for the Union, but not for the applicants. Candidates may improve their average position by forming a coalition, such as the aforementioned EFTA, Visegrád or the Baltic countries have.

Our model was intentionally kept simple, even simplistic. The assumption that all countries are the same seems the strongest one, although the model already contains the tools to relax this: by representing countries by coalitions of proportional sizes and restricting Π^f, size differences can be introduced. Asymmetry can be introduced by considering a discrete partition function, our solutions are easily adaptable.

The main limitation is of course the fact that we focus on a single aspect of the process: the strategic application for membership, our link to the international trade literature is only via the results of (Yi, 1997). We expect that a deeper study would refine our solutions.

There are some questions that we leave open. In larger games without the monotonicity assumption loops can arise and finding the solution becomes more difficult. The present model is still very simple and extensions can prove to be more descriptive. Morelli and Penelle (1997) discuss how different utility transfers affect the accession path; our example shows that even the possibility of transfers can improve the outcome.

Despite all these limitations there is a clear message: the direct route is not the quickest route. A strong *group* of applicants may enter with greater success than individually. While the EU is unlikely to grow indefinitely, certain aspects of the union will possibly be enjoyed by many, perhaps even beyond Europe. Those interested should prepare for a long fight and prepare strong outside options.

References

Baldwin, R., 1995, A domino theory of regionalism. In: Expanding Membership of the European Union, Baldwin, R., Haaparanta, P., Kiander, J., eds., Cambridge University Press, Cambridge, chap. 2, 25–47.

Baldwin, R. E., 1994, Towards an Integrated Europe. CEPR, London.

Bernheim, D. B., Peleg, B., Whinston, M. D., 1987, Coalition-proof Nash equilibria: I. Concepts. Journal of Economic Theory 42, 1–12.

Bond, E. W., Riezman, R., Syropoulos, C., 2004, A strategic and welfare theoretic analysis of free trade areas. Journal of International Economics 64, 1–27.

Bond, E. W., Syropoulos, C., 1996, The size of trading blocs. Market power and world welfare effects. Journal of International Economics 40, 411–437.

Chwe, M. S.-Y., 1994, Farsighted coalitional stability. Journal of Economic Theory 63, 299–325.

Flam, H., 1995, From EEA to EU: Economic consequences for the EFTA countries. European Economic Review 39, 457–466.

Gomes, A., 2005, Multilateral contracting with externalities. Econometrica 73, 1329–1350.

Kauppi, H., Widgrén, M., 2007, Voting rules and budget allocation in the enlarged EU. European Journal of Political Economy 23, 693–706.

Kóczy, L. Á., 2002, Finding the best way to join in: A dynamic accession game. In: Game Theory and Decision Theory in Agent-Based Systems, Parsons,

S., Gmytrasiewicz, P., Wooldridge, M., eds., Kluwer Academic Publishers, Multiagent Systems, Artificial Societies, and Simulated Organizations, 159–176.

Konishi, H., Ray, D., 2003, Coalition formation as a dynamic process. Journal of Economic Theory 110, 1–41.

Morelli, M., Penelle, P., 1997, Economic integration as a partition function game. Discussion Paper 9785, CORE, Louvain-la-Neuve.

Ray, D., Vohra, R., 1997, Equilibrium binding agreements. Journal of Economic Theory 73, 30–78.

Richardson, M., 1999, Trade and competition policies: *concordia discors*? Oxford Economic Papers 51, 649–664.

Rohrschneider, R., Whitefield, S., 2006, Political parties, public opinion and European integration in post-communist countries. European Union Politics 7, 141–160.

Seidmann, D. J., Winter, E., 1998, A theory of gradual coalition formation. Review of Economic Studies 65, 793–815.

Syropoulos, C., 1999, Customs unions and comparative advantage. Oxford Economic Papers 51, 239–266.

Thrall, R. M., Lucas, W. F., 1963, n-person games in partition function form. Naval Research Logistics Quarterly 10, 281–298.

Widgrén, M., 2006, Budget allocation in an expanding EU: A power politics view. Report 2006:11, Swedish Institute for European Policy Studies, Stockholm.

Xue, L., 1997, Nonemptiness of the largest consistent set. Journal of Economic Theory 73, 453–459.

Xue, L., 1998, Coalitional stability under prefect foresight. Economic Theory 11, 603–627.

Yi, S.-S., 1996, Endogenous formation of customs unions under imperfect competition: open regionalism is good. Journal of International Economics 41, 153–177.

Yi, S.-S., 1997, Stable coalition structures with externalties. Games and Economic Behavior 20, 201–237.