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# Conflict Analysis of the NAFTA Negotiations

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# **Conflict Analysis of the NAFTA Negotiations**

by

Niall M. Fraser and Francisco Garcia

## **Abstract**

The 1991-92 negotiations for a North American Free Trade Agreement (NAFTA) are modelled at two points in time during the negotiation process from a Mexican perspective. The first model in February, 1992 captures the positions of the parties on several key issues. The second model in April, 1992 concentrates on the energy issue which is of particular importance to Mexico. The formal model provided a framework for structuring the negotiation, and a communications medium for discussing and recording it. The analyses were fairly accurate as predictors of events and could have been effective in giving advice to the negotiators.

## **Keywords**

Negotiation, international trade, conflict analysis, modelling, NAFTA, Mexico.

## 1. Introduction

The North American Free Trade Agreement (NAFTA) negotiations are an important example of international trade negotiations. Involving Canada, the United States of America, and Mexico, NAFTA builds on the Canada-US Free Trade Agreement (FTA) of 1988 to reduce trade barriers among the three countries.

In the winter and spring of 1992, when this study was done, there was much speculation about how the negotiations would proceed. Of the three countries involved, Mexico had the most to gain and lose in the agreement, and interest in the negotiations was keen throughout the country. Much media attention in Mexico was focused on NAFTA. This was not the case in the other two countries. In Canada, NAFTA was overshadowed by constitutional issues and a recession, while in the US the presidential elections dominated the media, and both major candidates supported NAFTA.

In Mexican government and academic institutions many studies were done on the effects of a free trade agreement on the Mexican economy and on other issues associated with the agreement. One organization doing such work was the Centro de Estudios Estratégicos at the Instituto Tecnológico y de Estudios Superiores de Monterrey (ITESM). While a visiting professor at ITESM, Dr. Fraser became aware of this work and met Dr. Garcia. They decided to use a formal methodology to model the negotiation environment in the hope of providing insight into the negotiation process.

In most negotiations, the true interests of the negotiating parties are hidden. In international negotiation, however, the issues are usually so public that reasonable assumptions can be made, particularly in Canada and the United States where there are many competing sources of information. The situation is more difficult in Mexico, where the media, if not strictly government controlled, tends to be biased in the government's interests. It is difficult to separate fact from fiction, and often rumor is felt to be more reliable than the news. Although free from Mexican government influence, the foreign press rarely covers Mexican issues in depth.

In order to deal with the problem of lack of reliable information sources, the authors established a division of labor for the project which matched their knowledge and skills. Dr. Garcia provided the information about the case under study, and assessed the validity of the results. The information used was synthesized from many sources, but represented the best available knowledge of the status of the NAFTA negotiations. Dr. Fraser focused on the construction and analysis of the formal models. Consequently the paper is of interest not only as an example of the application of a formal methodology, but it is also interesting because it represents a Mexican point of view to the negotiations.

The formal methodology used is conflict analysis (Fraser and Hipel, 1984). A conflict has two or more decision makers, each of whom has its own objectives. The eventual resolution of the conflict depends on the strategic interactions of the decision makers during the evolution of the dispute. The conflict analysis methodology provides a systematic model of the conflict in terms of the decision makers, their objectives, and their preferences. Based on the conflict model and certain axioms of human behavior, conflict analysis provides predictions of courses of events as well as other useful information for assisting decision makers.

In this paper, some general background information about the NAFTA negotiations is provided. Following this, the conflict analysis methodology is briefly reviewed. Then two different models of the negotiations are presented as they were developed in February, 1992 and April, 1992. Conclusions from the study of the models are presented, as well as comparing these conclusions to what actually happened in the negotiations. This is a heuristic study, in that the models are developed to better observe the implications of information already known.

## **2. The NAFTA Negotiations**

The concept of a free trade bloc encompassing Mexico, the United States and Canada was seriously considered as long as thirteen years ago in an article published in Fortune magazine (Meyer, 1979). Even this long ago the issues and effects of such a treaty were remarkably clear,

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and the article is as useful an analysis today as it was in the 70's. The prescience of the author notwithstanding, the conclusion of the article is now glaringly mistaken. He predicted that both Canada and Mexico would, for different reasons, avoid such an agreement. In fact, in 1988 Canada negotiated a free trade agreement of unprecedented breadth with the United States, and now Mexico is on the verge of joining this pact in the North America Free Trade Agreement.

Meyer probably failed to recognise the effects of the tightening of trade relations in the European Community and the faltering of the GATT (General Agreement on Tariffs and Trade) negotiations. For Canada, the motive for entering the FTA negotiations seems to have been simply to ensure market access (Lipsev and York, 1988; Smith, 1988), while NAFTA gives it the ability to safeguard the gains achieved in the FTA, and perhaps improve on them (Hufbauer and Schott, 1992). For Mexico, NAFTA is seen as the route from the third world to the first. Although there may be a short term increase of Mexico's trade deficit, this is predicted to be offset by rapid growth (Hufbauer and Schott, 1992). Canada and Mexico each initiated the opening of negotiations for the FTA and NAFTA respectively.

President Carlos Salinas de Gortari of Mexico formally requested the commencement of negotiations to George Bush of the United States on June 11, 1990. Shortly thereafter, Canada asked to be a party to the Mexico-US negotiations. Negotiating teams were quickly assembled and intense activity, both private and public, has continued to the date of writing. Although the United States has a prior "free trade" treaty with Israel as well as Canada, the Canada agreement is recognised as the model for NAFTA, both because of its greater comprehensiveness than the Israel agreement and because the NAFTA negotiations are seen (by at least Canada and the US) as "adding" Mexico to the existing trading bloc.

The negotiations have been nominally secret. However, public actions and announcements by the three governments, supplemented by widespread speculation and analysis, has led to a fairly well-recognised understanding of the status of the negotiations at any time.

At the beginning of negotiations, six main areas of interest were recognised: 1) Market Access, 2) Rules of Trade, 3) Services, 4) Investment, 5) Intellectual Property and 6) Dispute Settlement. Seventeen working teams were formed to cover these six areas in depth, and each team was in

charge of the following specific topics: 1) Tariff and non-tariff barriers, 2) Rules of Origin, 3) Government procurement, 4) Agriculture, 5) Auto industry, 6) Other industrial sectors, 7) Dispute settlement in antidumping and countervailing duty cases, 8) Technical standards, 9) General principles for services negotiations, 10) Financial services, 11) Insurance services, 12) Road transportation, 13) Telecommunications, 14) Other services, 15) Investment, 16) Intellectual property, and 17) Dispute settlement.

Many of these areas do not invite public comment because they are not in dispute or have little effect in any of the involved countries. Other areas are subject to public discussion and often involve considerable differences of position. The later issues are of more interest in this study. Furthermore, the list above does not include energy because at the start of the negotiations Mexico denied that energy was a negotiable issue. Energy always was of interest to the US and Canada, and thus in spite of Mexican denials, was negotiable. This became more clear over time until Mexico eventually formally recognised energy as a negotiable issue.

The intent of the study was not to include exhaustively all of the above areas subject to negotiation, but rather examine those of particular interest about which the US and Mexican positions were known. They are:

1) Agriculture: For fruits and vegetables, Mexico wants to eliminate tariffs in order to gain greater access to U.S. markets. The U.S. wants to manage such trade through the use of quotas, increasing over time, in order to protect farmers in Florida and California. In grains, the contrary relationship is present, with Mexico wanting to maintain tariffs as long as possible to protect its farmers from the less expensive imports, while the US wants barriers dropped as soon as possible. In livestock, Mexico would prefer a quota management system for imports, while the U.S. would prefer elimination of all tariffs and barriers.

Mexico also wants to protect its agricultural sector from foreign control by limiting the amount of foreign investment, while the US would like to have no limitations.

2) Mining: Mexico does not permit non-state ownership of mineral resources. Further than this, it would like to restrict foreign investment to the purchase of "concessions" to extract the

minerals without ownership of the land under which the mineral are located. The US would prefer no restrictions on investment.

3) Energy: Mexico as a nation has a strong sense that unilateral control of its energy resources is vital to its security. Foreign participation in energy is a sensitive political issue in Mexico, and any relaxation of the restrictions in place is difficult to make. On the other hand, this sector is perhaps most in need of foreign investment. Mexico is willing to accommodate foreign participation to a limited extent in exploration, distribution and in the manufacture of some petrochemical products.

For the US, access to Mexican energy resources is relatively important. The US would prefer to be able to participate in all activities in the energy sector.

4) Banking, insurance and other financial activities: Mexico wants to protect its financial sector, gradually opening it up over 10 years. The US want all restrictions eliminated as fast as possible.

5) Auto Industry: Mexico prefers that automobiles not be treated separately from any other goods. The US prefers that special provisions be made for this industry.

6) Textile and apparel: Mexico prefers the total elimination of tariff and non-tariff barriers, while the US wants quota restriction at the beginning, reducing over time.

7) Rules of Origin. Rules of origin specify what goods imported into a country are recognised as being products of the exporting country, as opposed to being transhipped from a third country in order to avoid tariffs. Mexico wants a good to need less content from Mexico, the US or Canada (the "local" area) to be recognised as a tariff-free good than the US position. Another issue has to do with how the raw materials making up a good are classified. Mexico prefers that if a raw material is processed in a country (such as iron ore to steel, or crude oil to petroleum), then the processed product should be classified as native to the processing country, rather than native to the country providing the raw material. The US does not hold with this view.

Of course at any point in time different issues become highlighted in the media, and specific positions are publicly taken. However, the above reasonably summarises the positions of the parties during the time period covered by the analyses. Specific differences are indicated in the descriptions of the models below.

### 3. The Conflict Analysis Methodology

Conflict analysis is a methodology that is specifically designed for modelling and analyzing any decision problem involving multiple participants, each of whom may have multiple objectives. There are two important features of the methodology. First, the theoretical basis for the approach has a strong axiomatic foundation. The theory falls in the domain of non-cooperative game theory and within the theory solution concepts are defined for describing human behaviour. The second important feature of the approach is that the procedures for applying conflict analysis are easy to use and intuitively clear, even for a non-technical user. For a detailed description of both the theory and practice of conflict analysis, the reader can refer to the text by Fraser and Hipel [1984].

To apply conflict analysis to a particular problem, the following information is needed to develop a conflict model:

1. *Decision makers:* the main participants in the conflict.
2. *Options:* courses of action (also practices and regimes) available to each decision makers.
3. *Preferences:* the relative importance of options as viewed by each decision maker.

The foregoing model components correspond to the natural manner in which one thinks about a conflict. The decision makers are simply the individuals or groups involved in the conflict

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while their options are the things that they can do. The preferences are taken from simple statements about the objectives of each decision maker.

Options are binary in nature, and can either be taken or not taken. They can be acts of short duration, or the taking of policies or other actions that endure in time, but have a clear starting point. A particular combinations of options by all of the decision makers is called an *outcome*. An outcome corresponds to some situation in the world. If there are  $n$  options in total among the decision makers, they can be a maximum of  $2^n$  outcomes.

By taking into account the strategic interaction among the decision makers, the methodology permits one to carry out a variety of analyses on the conflict model which yield useful information for decision making. In particular, the conflict analysis procedures identify all possible outcomes of a conflict that are inherently stable - if they should occur in the real world conflict, they would likely persist. Such outcomes are called "equilibria". One can determine which of these equilibria are most likely to occur, and how decision makers can select their strategies in order to reach these outcomes.

An equilibrium requires that the outcome be stable for each decision maker (otherwise the decision maker would do something else and a different outcome would be formed). For the outcome to be stable, either of two cases must be true. The first case is that, given the option selections by the other decision makers, there must be no other option combination available to the decision maker that is preferred to the one under consideration. The second case is that there is a preferred option combination available to the decision maker, but if it should take this preferred combination there are changes in options by the other decision makers that would subsequently lead to a less preferred outcome. These two cases together form a very useful criterion for identifying outcomes of importance.

The procedures for modelling and analyzing a conflict can be performed by hand using paper and pencil. However, this can be an arduous task. Consequently, the DecisionMaker computer program [Fraser and Hipel, 1992], used in this study, has been developed for conveniently and thoroughly studying a conflict. There are other programs, such as CONAN (Howard, 1993) and INTERACT (Bennett, 1993), which could have been used in a similar manner.

The process of carrying out an analysis and examining the results assists decision making in several ways:

- \* Explains why an outcome is stable or unstable for a given decision maker.
- \* Forecasts compromise solutions.
- \* Pinpoints the most likely resolution.
- \* Allows extensive sensitivity analyses.
- \* Points out where more information is needed.
- \* Permits easy communication about a conflict with others.
- \* Describes paths for optimal decision making.

## **4. Model of the Negotiation for Feb, 19, 1992**

### **4.1 Decision Makers and Options**

The first step in developing a conflict model is to decide on the decision makers and options. A decision maker may be an individual, such as a charismatic leader of a country, or a group of people represented by an organization like a company, government, or labour union. Whatever the case, in order to be included as a decision maker in a conflict model, the individual or group must have the capability to exercise real power in the dispute. The power of the decision maker is expressed in terms of options or courses of action which are under its control and can be levied, if necessary, in the conflict.

It was felt that a model composed of the national negotiating teams of Mexico and the United States was appropriate. Canada, although a nominal participant in the negotiations, was not believed to be influential to Mexico. The possibility of constructing a model of the internal conflicts within Mexico was discussed, but the information acquisition problem for this approach would be difficult to overcome. Consequently the model at the international level was selected.

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which the issues and goals of the two parties were explored verbally. In this interchange, Dr. Garcia was able to organized his thoughts about the problem, while Dr. Fraser built up some background information. Next, Dr. Garcia listed on paper all of the issues he knew that were involved in the negotiations, and the positions of each of the parties on each issue. From this list, and subsequent discussions, Dr. Fraser prepared a set of possible options. Though several conversations and revisions, a final list of options was selected.

The list that was developed in this process was taken to the next step of analysis, but was not considered the final model. At each subsequent step, new information provided justification for small changes. For example, recognising that both decision makers share the same objective with respect to an issue may suggest that the issue not be incorporated into the conflict model because it would likely not be a target for tradeoffs or dissention. This recognition may not arise until the preferences of the decision maker are looked at in detail. The exact revisions to the model were not recorded as they were made, but eventually did lead to a model that no longer was modified.

This final model, consisting of a list of decision makers followed by the options under its control, is shown in Table 1. Comments opposite each decision maker and option explain who the decision maker is and what each option means, respectively. As can be seen, there are two decision makers and a total of fourteen options.

## 4.2 Option Combinations

In most conflicts, there are restrictions on how certain options can be selected. Options can be:

- 1) *Mutually exclusive*: only one option of a group available to a decision maker can be taken at one time.
- 2) *Dependent*: an option can only be taken if a different option is selected first.

**Table 1: Decision Makers and Options for Feb. 19, 1992.**

<i>Decision Makers and Options</i>	<i>Comments</i>
<b>Mexico</b>	
1 Gradual agricultural reduction	Press for a reduction of agricultural tariffs (grains) to be phased in over a 5 to 10 year period.
2 Limit agricultural investment	Establish a 49% limit for foreign investment in agribusiness firms
3 Limit mining to concessions	Only allow foreign investment under permits to exploit the minerals but not the ownership of the land.
4 Limit energy partic. to explor	Allow foreign participation in this industry only in exploration activities, and perhaps in the distribution of gasoline.
5 Limit banking investment	Allow foreign investment in the financial sector.
6 Demand tariff classif jump	Press for changes in how goods subject to tariffs are classified
7 Demand 50 % r of o	Press for 50% "local" content for imports to be free of tariffs
8 Get alternative energy invest	Try to obtain energy investment from Europe or Asia
9 Remove agric from agreement	Do not permit agriculture to be included in the agreement, but rely on the GATT
<b>US</b>	
10 Demand quota man. fruits & veg	Manage fruits and vegetables with a quota, to be increased over time.
11 Demand 60 % r of o	Press for 60% "local" content for imports to be free of tariffs
12 Demand quota on textiles	Press for quota restrictions on textiles, to be removed later.
13 Do not invest in energy	Do not make investments in Mexico's energy sector.
14 Pressure to open fin. sector	Lobby and apply other political pressure to open Mexico's financial sector to foreign investment.

- 3) *Necessary*: at least one of a group of options must be selected.

In this model, there are two examples of the first type of option combination. Mexico cannot demand a gradual reduction of tariffs in agriculture (option 1) and remove agriculture from the agreement (option 9) at the same time. Hence, options 1 and 9 are mutually exclusive. Likewise, options 2 and 7 are mutually exclusive because Mexico cannot limit agricultural investment in the agreement if agriculture is not part of the agreement. These relationships among the options are entered into the DecisionMaker program and are taken into account when performing the analysis.

### 4.3 Preferences

The final type of information required to complete the conflict model is the relative preferences over the available options for each of the decision makers. Specifying preferences for a given decision maker can be broken down into two stages. At the first stage, the options (or, in more complex cases, particular option combinations) available to all decision makers are ordered from most important to least important for a particular decision maker. Secondly, the decision maker has a preference as to whether it would want the option always to be taken, always not be taken, or sometimes be taken and sometimes not taken. The third case is referred to as conditional preferences. For instance, a decision maker may prefer to take a certain coercive option only if another decision maker takes aggressive action against it.

The preferences for the decision makers were entered into the DecisionMaker program as listed in Table 2. Again, the information represents the best judgement of Dr. Garcia, based on his wide experience and knowledge in the area, but includes no special communication with the negotiating teams or government decision makers.

Preferences for a given decision maker are expressed in terms of options (note the option numbers assigned in Table 1). The importance of options is indicated in a vertical list of the option numbers ranked from most important at the top to least important at the bottom. A

negative sign before an option number means that the decision maker prefers that the option not be taken. Option preferences can also be conditional, specified by an "if" condition, meaning that the decision maker prefers that an option be taken or not only if certain other options are taken or not. It should be noted that although all options are ordered in the NAFTA model, this is not necessary for either the DecisionMaker program or the underlying methodology. The program is limited to transitive preferences (although the methodology is not) and, moreover, the program does make it easier to enter some preference structures over others.

In order to interpret Table 2, first consider the preferences of Mexico. The most important option for Mexico is number 13, which concerns US investment in its energy industry. The minus (-) sign indicates that Mexico does not want the US to take its option of "do not invest in energy" i.e., Mexico wants the US to invest in energy. The second most important option for Mexico is number 4, concerning limiting foreign investment to exploration. The statement "4 if 13" means that Mexico sometimes wants to limit the investment (when the US does not invest in energy) and sometimes does not want to limit it (when the US does invest in energy). The list continues in descending order of importance to the least important option for Mexico, number 9 (removing agriculture from the agreement), which it would prefer to take if the US takes its option 10 (demand quota management on fruits and vegetables).

The US of course has different interests and thus a different order of options and different desires for the taking of the options. The most important option issue for the US is that Mexico does not limit investment in energy to exploration, while the second statement in the list indicates that the US would refrain from investing if Mexico did limit investment to exploration. The least important option for the US is also number 9 (Mexico removing agriculture from the agreement) which the US does not want to see happen.

#### 4.4 Results

The entering of preferences into the computer program completes the specification of the conflict model. DecisionMaker uses the conflict model to carry out automatically a stability analysis. By carefully examining the many possible moves and counter moves that can be exercised by the

**Table 2: Preferences for Feb. 19, 1992**

<i>Decision Maker and Preferences</i>	<i>Meaning</i>
<b>Mexico</b>	
-13	wants the US to invest in energy
4 IF 13	wants to limit energy participation to exploration if the US does not invest in energy
8	wants to get energy investments from Europe and Asia
-14	does not want the US to press for the opening of the financial sector to foreign investment
5 IF -14	wants to limit banking investment if there is no US pressure
6	wants to demand a tariff classification jump
7	wants to demand a 50% content for rules of origin
-11	does not want the US to demand a 60% content for rules of origin
-12	does not want the US to demand a quota on textiles
3	wants to limit mining to concessions
2	wants to limit agricultural investments
1	wants a gradual reduction in agricultural tariffs
-10	does not want the US to demand quota management for fruits and vegetables
9 IF 10	wants to remove agriculture from the agreement if the US demands quota management for fruits and vegetables.
<b>US</b>	
-4	does not want Mexico to limit energy participation to exploration
13 IF 4	want to not invest in Mexico's energy sector if Mexico limits energy participation to exploration; otherwise it would want to invest.
-5	does not want Mexico to limit banking investment
11	wants to demand 60% rules of origin
-7	does not want Mexico to demand 50% rules of origin
-6	does not want Mexico to demand a tariff classification jump
12	wants to demand a quota on textiles
-3	does not want Mexico to limit mining to concessions
10	wants to demand a quota on fruits and vegetables
-1	does not want Mexico to demand a gradual agricultural reduction
-2	does not want Mexico to limit agricultural investment
14 IF 5	wants to apply pressure to the financial sector if Mexico limits banking investment; otherwise does not want to apply pressure.
-8	does not want Mexico to get alternative energy investment
-9	does not want Mexico to remove agriculture from agreement

decision makers, the DecisionMaker program can determine if an outcome is stable for a particular participant.

An outcome is stable for a decision maker if it is not advantageous for it to move away unilaterally from the outcome by changing its selection of options. Even though the decision maker may be able to move to a more preferred outcome by selecting different options under its control, other decision makers may be able to put it in a less preferred situation by choosing other options. Therefore, the outcome is stable and the decision maker is better off to stay where it is. If an outcome is stable for all of the decision makers, it is referred to as an equilibrium because it is a possible resolution to the conflict. Once reached, the conflict will remain at the equilibrium, unless the conflict model varies because of changes in preferences or other parameters over time.

Equilibria are categorised in groups ranging from very strong to very weak. For the NAFTA model, there were a total of 894 equilibria. All of these equilibria fell into the category of "strong" equilibria. This is a large number of equilibria (about 10% of all possible outcomes), and is probably the result of the extremely divergent interests of the two parties. In order to recognise the most interesting equilibria to look at more closely, a subset of these 894 were selected by setting as fixed an appropriate group of the options. In particular, if it assumed that Mexico would always demand a gradual reduction of tariffs on grains (option 1), would always demand a tariff classification jump (option 6), would always demand 50% content for rules of origin (option 7) and would always look for alternative energy investment money (option 8), while the US would always demand a quota for fruits and vegetables, would always demand 60% content for rules of origin, and would always demand a quota on textiles, then the set of equilibria reduces to only 11.

The 11 equilibria under these assumptions are shown in Table 3. In this Table, a letter Y opposite an option means "yes" it is taken by the decision maker controlling it, while N signifies "no" it is not selected.

**Table 3: Most Likely Equilibria for Feb. 19, 1992**

<i>Decision Makers and Options</i>	<i>"Interesting" Equilibria</i>									
<b>Mexico</b>										
1 Gradual agricultural reduction	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
2 Limit agricultural investment	Y	Y	N	Y	N	Y	Y	N	Y	N
3 Limit mining to concessions	Y	Y	N	N	Y	Y	Y	N	N	Y
4 Limit energy partic. to explor	N	N	N	N	N	N	N	N	N	N
5 Limit banking investment	N	N	Y	Y	Y	N	N	Y	Y	Y
6 Demand tariff classif jump	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
7 Demand 50% r of o	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
8 Get alternative energy invest	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
9 Remove agric from agreement	N	N	N	N	N	N	N	N	N	N
<b>US</b>										
10 Demand quota man. fruits & veg	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
11 Demand 60% r of o	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
12 Demand quota on textiles	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
13 Do not invest in energy	Y	Y	Y	Y	Y	N	N	N	N	N
14 Pressure to open fin. sector	Y	N	N	N	N	Y	N	N	N	N

#### 4.5 Status Quo Analysis

In a status quo analysis, DecisionMaker can be used to explain how the dispute evolves from the current situation, perhaps through some transitory outcomes, to an eventual equilibrium. The status quo, or current situation, was identified as the one on the far left in Figure 1.

When an outcome is unstable for a decision maker, the decision maker can move to a more preferred position by changing its selection of options to form what is called an unsanctioned unilateral improvement. A change by a decision maker to a better outcome is a unilateral improvement; if such a change cannot result in a worse outcome even of the other decision makers subsequently try to improve their own positions, it is also unsanctioned. It is thus impossible, in this case, for other decision makers to block the unilateral improvement by changing their option choices.

<i>Decision Makers and Options</i>	<i>Status Quo Outcome</i>	<i>Transient Outcomes</i>			<i>Equilibrium Outcome</i>
<b>Mexico</b>					
1 Gradual agricultural reduction	Y	Y	Y	Y	Y
2 Limit agricultural investment	Y	Y	Y	Y	Y
3 Limit mining to concessions	Y	Y	Y	Y	Y
4 Limit energy partic. to explor	Y	Y ---->	N	N	N
5 Limit banking investment	N	N ---->	Y	Y ----->	N
6 Demand tariff classif jump	Y	Y	Y	Y	Y
7 Demand 50% r of o	Y	Y	Y	Y	Y
8 Get alternative energy invest	Y	Y	Y	Y	Y
9 Remove agric from agreement	N	N	N	N	N
<b>US</b>					
10 Demand quota man. fruits & veg	Y	Y	Y	Y	Y
11 Demand 60% r of o	Y	Y	Y	Y	Y
12 Demand quota on textiles	Y	Y	Y	Y	Y
13 Do not invest in energy	N ----->	Y	Y	Y	Y
14 Pressure to open fin. sector	N	N	N ---->	Y	Y

Figure 1. Progression from the Status Quo to the Equilibrium for Feb. 19, 1992

From the status quo outcome on the far left in Figure 1, an arrow is used to indicate which option can be changed by the US to take advantage of its unsanctioned unilateral improvement to move to a more preferred outcome. In particular, the US can change its position by deciding not to invest in energy in Mexico, which is more preferred for it according to the given preferences, since in the status quo Mexico is limiting investments to exploration.

However, the new outcome is also unstable, for Mexico. The response by Mexico, also shown by arrows, is to open the energy sector to other investment, while at the same time limiting banking investments. Subsequently, the US puts pressure on the financial sector, resulting in the investment limits being removed. Finally, all possible improvements have been made, leading to the equilibrium on the far right in Figure 1.

There may be several different routes from a status quo outcome depending on which player moves first, and there also may be several good choices of the best outcome to represent the status quo. Figure 1 represents one possible route, although all others tested resulted in the same

equilibrium, the one at the far right in Figure 1. Thus this equilibrium, of the 894 possible ones, has definite importance in this problem.

However, there are many other possible equilibria; in particular among the 11 in Table 3 are several which are preferred by Mexico to the "natural" result, the one on the far right in Figure 1. The progression from a status quo to an equilibrium assumes that the decision makers simply directly follow their preferences as presented in the model. However, a decision maker can of course take any action it wishes in order to secure a particular outcome.

The natural outcome is not particularly favorable for Mexico. Another of the 11 likely possibilities that is significantly better is the one 5th from the right in Table 3. Note that this outcome is exactly the same as the natural outcome, except that the US has not taken its options 13 and 14. Option 13 is where the US does not invest in Mexico's energy sector. Since this option is the most important one for Mexico, it would be a significant achievement for Mexico to attain this outcome. Option 14 concerns pressure by the US on Mexico's financial sector. This is fourth-ranked for Mexico, and is thus also an important achievement.

Achieving this outcome is straightforward, according to the analysis. The outcome is "rational" for the US (a characteristic calculated and reported by the DecisionMaker program), which means that there are no changes from the outcome that the US can take, without resulting in an outcome less preferred by the US. In other words, once the outcome is achieved, the US is "locked" into it as a consequence of its own preference structure. Note that the options taken by the US are the same in this outcome as they are in the status quo outcome shown in Figure 1. Thus Mexico can achieve the outcome simply by taking the options that correspond to the desired outcome, unilaterally.

This amounts to Mexico unilaterally opening up both the energy sector and banking to foreign investment. The model suggests that this will happen anyway. However, if Mexico fails to take the initiative it will happen after the relationship with the US investment community has soured.

Another possibility is found in the outcome on the far right in Table 3. This is even more favorable to Mexico because although the energy sector is opened, limits on investment in the

financial sector remain in place. A close analysis reveals that although this outcome is not "rational" (under the technical definition) for either Mexico or the US, there are forces present that would constrain the US from changing its position. Again, this outcome is achieved by the relatively simple adoption by Mexico of the corresponding options; in particular, opening of the energy sector to foreign investment.

#### 4.6 Other Observations from the Analysis

Things in common among the equilibria of a conflict are useful since they suggest which of the options must be taken (or not taken) no matter which of the equilibria arises through the interactions of the decision makers. Options 4 and 8 were both taken in all 894 equilibria for this model. No other options were taken or not taken in every equilibrium. This says that Mexico is bound to, given the assumptions about preferences contained in the model, liberalize investments in its energy sector. It will also, irrespective of what else happens, continue to look for other sources of investment capital.

There are many things in common among the 11 outcomes selected as being most "interesting" (Table 3). These were selected by specifying a particular status for several options, and thus of course these options are in common among them. However, in the selection process nothing was specified about option 9, which is taken in each of the 11 outcomes. This suggests that agriculture will not be removed from the agreement, in spite of the fact that Mexico can do so unilaterally, and would generally want to as long as the US demands quota management for fruits and vegetables.

## **5. Model of the Negotiation for April 15, 1992**

### **5.1 Status of the Negotiations**

As of April 15, 1992 it was clear that the model of February 19, 1992 was a remarkable predictor of the developments in the negotiations. Mexico had made movements indicating liberalization of the energy sector, but not the financial sector. Agriculture remained an issue within the treaty, and the US had not made movements to either not invest in energy or to pressure the financial sector. In short, Mexico appeared to be carrying out all actions necessary to achieve the outcome on the far right in Table 3.

One other development occurred that was not captured in the February 19th model. The US had actually tightened up its demands concerning rules of origin. They had been asking for 60% from the local area, but had increased that to 70%. As of April 15, there were still questions as to whether they would maintain this demand.

It was recognised at this time that Mexico would relax some of the restriction on foreign investments in the energy sector. What was not clear was exactly what would be negotiated. It is difficult because not only is energy a sensitive political issue, but the Mexican constitution clearly restrains direct foreign investment in the petroleum industry.

Consequently, a second model was developed that captured the issues of concern in the negotiations of April 15. In the energy issue, there were several possibilities available to Mexico. One thing they could do was to make a separate energy agreement with Canada. If nothing else, this would blunt the importance of the energy provisions in NAFTA. Mexico could also reclassify the petrochemical products. So-called "basic" products are limited to production by Pemex (the state monopoly), while for other, non-basic, products private (including foreign) production is permitted. By simply reclassifying some currently basic products as non-basic, foreign investment possibilities are widened. A third option for Mexico was to open the distribution of gasoline and/or natural gas to foreign firms. Finally, investment in exploration and/or production could

be liberalized. The only option considered as available to the US is a relaxation from the extreme position concerning rules of origin to a more moderate demand.

**Table 4: Decision Makers and Options for April 15, 1992**

<i>Decision Makers and Options</i>	<i>Comments</i>
<b>Mexico</b>	
1 Energy agreement with Canada	Make an agreement with Canada outside of NAFTA.
2 Reclassify basic products	Permit some petrochemical products that were formerly restricted to be produced by foreign firms
3 Open distribution gas/nat gas	Allow foreign firms to distribute gasoline and natural gas in Mexico.
4 Open exploration and production	Allow foreign to explore for energy resources and produce energy products.
<b>US</b>	
5 Accept 50 or 60 % rules of origin	Relax from its current demand for 70% "local" content for rules of origin and accept the more moderate position of 50 or 60%.

The resulting two-decision maker, five option model is shown in Table 4. There are no option combinations affecting this model. The preferences were established and are illustrated in Table 5. In establishing the preferences for the US, it was not clear whether energy issues (options 4, 3 and 2) were in fact more important or less important than the issue of rule of origin. Several variations of preferences were tried and the results were not different in any significant way from the results given by this particular model.

## 5.2 Results

A total of 6 equilibria were determined for this model, which are illustrated in Table 6. As in the February 19 analysis, again in this model there is a "natural" equilibrium that arises from the

**Table 5: Preferences for April 15, 1992**

<i>Decision Maker and Preferences</i>	<i>Meaning</i>
<b>Mexico</b>	
-4	does not want to open exploration and production
5	wants the US to accept 50 or 60% rules of origin
1	wants a separate energy agreement with Canada
2	wants to reclassify basic products
-3	does not want to open the distribution of gas and natural gas
<b>US</b>	
4	wants Mexico to open exploration and production
3	wants Mexico to open the distribution of gas and natural gas
2	wants Mexico to reclassify basic products
-5	does not want to accept 50 or 60% rules of origin
-1	does not want Mexico to have a separate energy agreement with Canada

status quo. This is the outcome on the far left in Table 6, where Mexico makes a separate agreement with Canada, reclassifies some basic products (but does no further liberalization), while the US does not change from its position on rules of origin. Not only does this outcome come about in the natural course of events, but is "rational" for both parties. This means that the forces making it stable are very strong (it is a very strong equilibrium).

Of the other five equilibria, the one on the far right in Table 6 is of particular interest. It is a "mutually beneficial" equilibrium, which means that of all 6 equilibria, this one is the best for both decision makers. In other words, even though it does not arise if the decision makers move directly according to their interests, and even though it is not a "very strong" equilibrium, it is preferred by each of the players over any other equilibrium. This surprising result is not as odd as it may seem - the well-known Prisoner's Dilemma (eg., Rapoport and Chammah, 1965) exhibits the same principle. Neither decision maker can unilaterally achieve the preferred outcome - they somehow must work together to make it arise by individually taking actions that are only worthwhile if the other also takes the appropriate action.

**Table 6: Decision Makers and Options for April 15, 1992**

<i>Decision Makers and Options</i>	<i>Equilibria</i>					
<b>Mexico</b>						
1 Energy agreement with Canada	Y	N	N	N	Y	Y
2 Reclassify basic products	Y	N	Y	Y	N	Y
3 Open distribution gas/nat gas	N	Y	Y	N	Y	Y
4 Open exploration and production	N	N	N	N	N	N
<b>US</b>						
5 Accept 50 or 60 % rules of origin	N	Y	Y	Y	Y	Y

In particular, the options that make the outcome on the right in Table 6 the best are options 3 and 5. Option 5 is more important to Mexico than 3: by giving in on the gas and natural gas distribution, Mexico can gain on rules of origin. Symmetrically, the US finds the gas and natural gas distribution more important and can be traded off against the rules of origin. Note that this relationship is not a consequence of a condition preference (such as "3 if 5" in the preference statements) but rather is caused by the fundamental interests of the parties. The tradeoff exists independently of whether the decision makers explicitly recognise it.

In order to achieve the preferred equilibrium outcome, there must be an explicit process of negotiation. Since neither party can achieve it unilaterally, both actions must be linked to a contract of some sort. Obviously, NAFTA provides a mechanism for negotiating and implementing such an agreement.

As of writing, only partial information had been released to assess the predictive validity of the April 15 model. The final rules of origin content was 62.5%, although earlier reports suggested an agreement of 60% (Financial Times, 1992). The number of basic petrochemical products were reduced from 19 to only 8 through recassification. The distribution of natural gas and electricity has been liberalized for border states only, and limited service contracts for oil exploration for foreign companies are now possible. No separate energy agreement with Canada has been made. Thus the situation as of March, 1993 corresponds fairly closely to the third equilibrium from the left in Table 6.

## 6. Conclusions

The study of the NAFTA negotiations was in some ways surprisingly successful. The February 19 model was remarkably accurate as a predictor of how the negotiations proceeded. The April model failed to reflect the precise conditions of the agreement correctly, but was certainly very close to the actual events, and captured the principles of the negotiations well. In fact, the only significant difference between the predicted result, it could be argued, is that a separate energy agreement with Canada has not yet been made.

The process undertaken in this study was not originally intended to provide advice to the Mexican negotiating team. However, the results could have been usefully employed for this purpose.

Many aspects of the modelling and analysis process were valuable:

- \* Identifying the decision makers and options first required a general examination of the entire negotiation process. Following the identification of the international negotiating teams as the best level at which to study the problem, it was necessary to recognise that, at least from the Mexican perspective, Canada is not an important participant. Also, from all of the available information a set of options was selected. This process required considerable study and provided a valuable framework for investigating the negotiations.

- \* Assessing the preferences of the participants required even closer study. The level of detail expressed in the preference orderings of options is finer than normally possible in even a comprehensive ordinary written description of the goals and interests of the negotiators.

- \* The process of building the conflict model provided a convenient means of communicating the key aspects of the negotiations. The model furnished a language for discussing the structure of the negotiations and a notation for recording it.

\* The negotiations are complex and it can be difficult to see the implications of information that is already available. This is the benefit of the stability analysis: to be able to draw conclusions quickly about the negotiations that are otherwise masked by the amount of information available. This was true in both models analyzed. The results were insightful yet inevitable.

\* The future can never be predicted with assurance. The fact that one or both of the models developed in this paper were fairly accurate predictors is gratifying but not critical evidence of their efficacy. On the other hand, the ability to assess all of the available information must permit an analyst to make better judgements. The ability to make better decisions is worthwhile, even if events differ from those expected.

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