National interests, coalitions and rules of decision in multilateral trade negotiations

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The Uruguay Round has often been described as an opposition between USA and European Union (EU) about agriculture. In contrast, the Cancun summit, of which the objective was to launch the Doha Development Round (DDR) highlighted numerous conflicts of interest between various countries or coalitions of WTO (World Trade Organization) members.

In WTO rules, it is stipulated that any international agreement on a global package has to be adopted unanimously. As a matter of fact, controversial issues are various : degree of liberalization in agricultural sector, progressive or linear formulae, cancellation of export subsidies, decoupling of domestic support, liberalization in non agricultural sectors, special and differential treatment to be reserved to developing countries or to least developed ones, Singapore issues about trade facilitation, investment policy… On the other side, trade negotiations are affected by the emergence of new coalitions: G10, G22, G90, Like-Minded Group, SVE (Small and Vulnerable Economies), Cairns group…

About many issues, it is difficult for coalitions to avoid controversy. Of course, negotiating actors could have adopted strategies: standing on maximalist positions in order to obtain greater benefits. But convergence is slow such that pundits are rather pessimistic. One can change rules of negotiation ; for this purpose Sally (2004) suggested that least developed countries could be excluded from negotiating: '*Stated baldly : only a minority of the WTO members have the bargaining power and capacity to advance negotiations. These are the OECD countries and about a score or so of advanced developing countries (most of them in the G20). Hence the key liberalising and rule-making deals in the WTO must be done by the 30-plus countries (counting the EU as one) that accounts for over 80% of international trade and an even bigger share of foreign direct investment.*' (Sally, 2004, p. 11). On one side this proposal is not democratic and could give rise to worldwide public outcry; on the other side success is in no case guaranteed, for deepest dispute may engage rich and emerging countries. Majority voting may also be adopted even if it is difficult to envisage an unvoluntary change in national trade policy due to an international agreement.

The objective of this paper is to examine the case of a unanimous agreement in international trade negotiations. For this purpose we study fundamental interests of

WTO members in respect of a global package that could be agreed by these countries. We are trying to determine which negotiations issues are the most beneficial for each WTO member and to link these elements to national economic features.

The starting point is an inversion of traditional methodology: testing a large set of various scenarios by a Computable General Equilibirum Model (CGEM) and ranking them for each country. This approach should lead to an identification of countries position in the multilateral trade negotiation, whatever is their official position.

Firstly considering that countries maximize national welfare, an axiomatic approach is used; bargaining theory and cooperative games offer some solutions to this kind of problematic. This is why we examine a theoretical solution to this cooperation problem: the Nash solution.

In the real bargaining process, two elements could modify this scenario. Firstly the WTO members' economic sizes are quite different and this could clearly influence the agreement. Modelling trade negotiation needs the introduction of bargaining powers. The bigger a trading zone is, the larger influence it gets on the agreement. These parameters could be changed by the composition of trade coalitions.

Secondly a central methodological element is the definition of national interest. National welfare captures the total gains of a nation from improving worldwide market access, but it does not tackle the redistributive conflict which is implied by this process. Moreover political governments are quite sensitive to loss of individual income caused by a political decision. The study is thus using a pragmatic approach where governments are seeking to maximize benefits from cooperation (welfare) while minimizing adjustments costs (income losses). This hypothesis may be linked to recent developments in political economy of protectionism (Grossman et Helpman, Bagwell et Staiger, 1999 ; Ozden et Reinhardt, 2004).

Section 1 presents methodological assumptions: main features of the CGEM, sector and geographic breakdown, definition of national interests, definition of scenarios to be tested. Section 2 reveals the Nash solution of this bargaining process when each trading zone is equally weighted and objective function is welfare. Section 3 focuses on the inclusion of bargaining powers and the possibility of coalitions. Section 4 studies the negotiation when governments take into account national welfare and redistributive costs. Section 5 concludes.

1. Methodological aspects

In order to simulate the complexity of multilateral negotiations, the detailed impact of global agreements (agricultural market access, export subsidies and domestic support, industry and services liberalization) is evaluated using a CGEM. This method is now detailed: main assumptions of the CGEM, main features of the database, geographical and sector breakdown, specification of national objective function.

1.1. Modelization instruments

The study is based on the use of two modelization instruments; the first one is the MIRAGE (Modelling International Relationships in Applied General Equilibrium) model. It is a dynamic (recursive-type) multinational model with representation of perfect and imperfect competition. In each country, nesting in demand function illustrates a quality-based differentiation between products coming from North and those coming from South. On the supply side, added value and intermediate goods are

complement (Leontief hypothesis); added value is a composite CES function of unskilled labour and a composite factor (capital-skilled labour) in order to differentiate substitution elasticity between factors. In agricultural and mining sectors, added value also incorporates land and natural resources ([1]). Capital is sector-specific and investment increases the production capacity in the most profitable activity.

The most recent version of MIRAGE is utilized under its static version, without any modelling of Foreign Direct Investment, with no intervention prices and no productive quota in agriculture. Our study is based on the simulation of 143 liberalization shocks such that each simulation must be quickly conducted.

The second modelling instrument is the Macmaps_HS6 database. It is a measure of market access in 140 countries in 2001, and it exhaustively includes regional agreements and preferential regimes ([2]). Tariff simulation takes into account the interaction between bound rates, MFN applied rates and preferential rates at the HS6 level: tariff formulae are applied on bound rates; applied rates (MFN and preferential) are reduced if and only if the decrease in bound rates lead then under applied tariffs.

Moreover, tariff shocks are simulated at the HS6 / country level (and not at the sector level) before average protection is re-calculated at the sector / zone level, defined in the exercise, in order to minimize loss of information.

1.2. Scenarios

A set of scenarios is simulated by the CGEM. The set is defined as an adapted representation of what could be negotiated in the WTO arena. Five dimensions of the negotiation process are illustrated:

(i) extent of reduction in custom duties;

(ii) degree of progressivity of the formula;

(iii) application of a Special and Differential Treatment (SDT) in favour of developing countries;

(iv) global or sectoral negotiation;

(v) reduction in export subsidies and domestic support.

Three domains are considered: agriculture, industry and services.

Available measures of protection in services are either uncomplete or not reliable for a systematic analysis of global and multilateral liberalization ([3]). Due to this lack of information, the following assumption is made: the rate of protection is supposed to be uniform in all countries in the business services activity (the only one which is supposed to be liberalized) and equal to 20%. This figure represents a transaction cost, which gives local government no receipt. Given this initial configuration, two scenarios are studied: either no liberalization is processed in this sector, or a half reduction is applied on this *ad valorem* equivalent.

As far as industry is concerned, three aspects of the current negotiation are taken into account: firstly the degree of progressivity in tariff reduction is tackled by the application of a Swiss formula, of which the coefficient may take two values ([4])

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[1] For a more detailed presentation of MIRAGE, see Bchir and alii (2002 a et b).

[2] For a more detailed presentation of Macmaps_HS6, see Bouët and alii, 2004.

[3] This is the case of equivalents of protection included only partially in GTAP database, of measures based on frequency indexes (Hoekman, 1995), on price differences (Trewin, 2001; Kalirajan and alii, 2001) or on residuals of gravity equations (Francois and Hoekman, 1999). In each case, methodologies are not robust, or need too much information to be implemented at a worldwide level. For a survey of this issue, see Chen and Schembri, 2002.

[4] Swiss formula is: $t1=(at0)/(a+t0)$; $t0$ is the initial tariff, $t1$ the final one, a is positive.

(a=5% and a=10%); secondly this formula may be applied with or without Special and Differentiated Treatment (SDT). In case of SDT, coefficients are doubled for developing countries. Thirdly a worldwide and total liberalization in textile and apparel sector is simulated ("0 for 0 option"), while other industrial sectors are liberalized through a weakly progressive formula with SDT.

Agricultural tariffs may be reduced according to a very progressive Swiss formula (a=15) or a weakly progressive one (a=30), with SDT or not (deoubled coefficients for developing countries, or the formula may be linear (36%) without SDT.

Finally, as far as subsidies (export and production) are concerned, they may be reduced by 50%, or unchanged. In the case of domestic support, the reduction in subsidies increases decoupled support by the same amount.

When liberalization is progressive, noise tariffs are cancelled.

Globally, 143 scenarios are simulated. In each case, the pre-experiment data include a complete application of the Uruguay Round, the main recent trends of WTO farm policies (Agenda 2000, US Farm Bill) and all bilateral agreements and preferential regimes, which are effective in 2001. Tariff reduction formulae are applied on bound duties, declared by member countries to WTO. Applied rates are reduced to new nound rates if and only if new bound rates are under applied rates.

1.3. Geographical breakdown

The basic objective of the study is to take into account national interests of a large set of WTO members. These countries should get a singularity, either in terms of (preferential) market access, or in terms of trade specialization, or of geographical structure of exports. Indeed the analysis has to illustrate « breaking-down points » of national interests, for some countries, in the set of potential agreements. The economice size is not the only criterion of selection. If a country presents some peculiarities in terms of national interests in the trade negotiation, it has to be isolated on the geographical breakdown. Of course, it is impossible to keep a very large set of countries or regions, because it would imply a long calculation time: ths study proceeds to numerous simulations.

Table 2 : geographical breakdown

Num.	Code	Name	GTAP region
1	UE	Union europ. à 25	aut bel dnk fin fra deu gbr grc irl ita lux nld prt esp swe hun pol xce
2	US	Etats-Unis	Usa
3	CA	Canada	Can
4	JA	Japon	Jpn
5	KO	Corée du sud - Taïwan	Kor twn
6	CH	Chine	Chn
7	IN	Inde	Ind
8	BG	Bangladesh.	Bgd
9	FS	Ex-Union soviétique	Xsu
10	BR	Brésil	Bra
11	AR	Argentine	Arg
12	MX	Mexique	Mex
13	CA	Amérique centrale, Caraïbes	Xcm
14	AU	Australie	Aus
15	NZ	Nouvelle-Zélande	Nzl
16	RA	Reste de l'Asie	mys phl vnm lka xsa

		émergent	
17	SS	Afrique sub-saharienne	mwi moz tza zmb zwe xsf uga xss
18	AS	Afrique du sud	bwa xsc
19	PM	Pays méditerranéens	Tur xme mar xnf
20	AE	Norvège, Islande, Suisse	che xef
21	id	Idn	Idn
22	Cl	Chili	Chl
23	Th	Thaïlande	Tha
24	RM	Reste du Monde	Hkg sgp Col per ven xap ury xsm xsu xrw

Table 2 shows the different countries and regions which are taken into account in the simulations. First of all, the countries of the Quadrilateral (European Union, USA, Japan, Canada) are studied because openness of those economies represents a major stake for the rest of the world and because they have granted large preferenrial access to developing countries. Australia and New Zealand are distinguished: these are two very competitive agricultural exporters (Cairns group), but Australia is significantly more protectionnist.

Heterogeneity of the G22 ([5]) is obvious: this group contains highly open economies (Chile, Philippines), countries with intermediate level of protection (China, Mexico, Thailand) or with very restricted market access (India). In some regions, protection is especially high in agriculture (Turkey, South Africa); in others, in industry (Brazil, Argentina, Colombia, Peru). Intersectoral disparity of protection is high in South Africa, Turkey, low in others. Argentina, Brazil, Chile, Colombia and Thailand have agricultural comparative advantage; South Africa, Chile, Mexico are competitive in the non agricultural primary sector. Most of those countries are getting trade advantages and disadvantages in industry. China, for instance, is competitive in textile, clothing and industrial machinery, but it is not in chemical products and electronics.

G22 is indeed a heterogenous group such that incorporating these countries in the model is worthwhile: it allows for testing the coalition stability. The case of China, India, Brazil, Argentina, Mexico, South Africa, Chile and Thailand is specially examined Others G22 – members belong to other zones.

Inside the G10, Japan is left aside due to its size and to trade preferences that are granted to developing countries; two G10 sub-groups are distinguished, on one side Korea and Taïwan, on the other side Switzerland, Iceland and Norway. All these five countries are rich, adopt a highly- protectionist trade policy in agriculture, and quasi free trade in industry. The only difference between these two sub-groups is the geographical structure of their trade.

The situation of least developed countries in this negotiation process is unclear: Firstly they ask for a cancellation of export and production subsidies in the agricultural sector of the richest countries (see for example the cotton initiative) and for a large improvement of market access. Nevertheless, a worldwide agricultural liberalization could have negative impact on those countries. On one side, it would imply soaring world prices in agricultural markets and the major part of least developed countries are net food importers. On the other side multilateral reduction in agricultural tariffs means erosion of trade preferences which those countries have been granted (European Union, USA, Japan,...). The CGEM studies the impact of

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[5] As they are not in the GTAP database, ten G22 countries are not included in this study: Bolivia, Costa Rica, Cuba, Egypt, Equador, Guatemala, Kenya, Pakistan, Paraguay, El Salvador.

potential trade agreements on two least developed zones or countries, which are currently net food importers and beneficiaries of trade preferences: subsaharian Africa and Bangladesh.

Indonesia is a specific country: it is relatively poor, its size is very large (the 4th population in the world), it is an open economy (its global protection is 5.6%) with an only minor trade preference conceded by the richest importing countries (USA, EU – GSP), it has comparative advantages in the food industry, in some primary activities (rubber, wood) and in industry (textile, apparel, wood products and paper).

Finally three zones are distinguished: the former Soviet Union, Mediterranean countrues (Turkey, Morocco, and the rest of North Africa and Middle East) and the rest of emerging Asia. In those three blocks, countries are relatively homogenous in terms of geographical and sectoral structure of trade, of levels of protection and of preferential access to large economies.

1.4. Sectoral decomposition

Eighteen products are included in the simulation: 6 in agriculture, 2 non agricultural primary products, 7 in industry and 3 in services (cf. tableau 3).

Table 3: sectoral decomposition

Num	Aggregate sectors	Code
1	Animals	Animals
2	Cereals	Cereals
3	Dairy products	Dairy_prod
4	Vegetables	OthVeg
5	Sugar	Sugar
6	Agrifood Industry	Agri_Ind
7	Extraction	Extraction
8	Fishing	Fishing
9	Machinery and equipment	Mach_Ind
10	Mineral and metal products	Metal_Ind
11	Tex_Wea	Textile apparel
12	Wood Paper	Wood Paper
13	Chim_Ind	Chemical Industry
14	Tran_Ind	Tran_Ind
15	OthInd	Other Industries
16	Services	Services
17	Trans	Transport
18	Utilities	Utilities

2. A Nash solution of the bargaining process

Let us consider that this trade negotiation is a bargaining between 24 zones. The initial situation is the statu quo, or threat point of this negotiation process. Let

W^m_0 be the initial welfare of country m, $W^m(s)$ the welfare of country m when solution s is adopted, S is the set of potential agreements s.

Firstly we consider that each trade partner has the same bargaining power. The Nash solution s* of this bargaining is defined by

$$s^* \in Arg_{s \in S} \ Max \ G(s) = \prod_m \left[W^m(s) - W^m_0 \right] \qquad (1)$$

$$under: \qquad W^m(s^*) \geq W^m_0 \qquad \forall m \qquad (2)$$

(2) is a individual rationality constraint.

We demonstrate that the solution to (1) under (2) is the solution s1530: liberalization in services, a very progressive formula in agriculture and industry without SDT, with a "0 for 0" option in textile and clothing, no change in export subsidies and domestic support.

2.1. Game theoretic interpretation of the Nash solution

To be completed

2.2. Economic interpretation of the Nash Solution

To be completed

3. Trade negotiations, bargaining powers and coalitions

3.1. The introduction of bargaining powers

We introduce bargaining powers by considering that the excess utility of country m in G(.) function is weighted by α_m which is country m 's share in world GDP. The bargaining problem is now:

$$s^* \in Arg_{s \in S} Max G(s) = \prod_m \left[W^m(s) - W^m_0 \right]^{a^m} \qquad (1')$$

$$under: \qquad W^m(s^*) \geq W^m_0 \qquad \forall m \qquad (2')$$

We demonstrate that the solution of this problem is the agreement s1531. It consists in the same elements of the trade negotiation, except for subsidies which are reduced.

Economic interpretation of this result: to be completed.

3.2. Trade negotiations and coalitions

We now introduce the possibility for countries to form coalitions. The objective of coalitions is to improve its influence on the bargaining process in order to obtain a better agreement.

We define firstly the objective function of a coalition.

It is the product of the excess utility of each country, weighted by economic size.

The objective of the (m;m') coalition is thus defined by:

$$\left[W^m(s) - W^m_0 \right]^{b^m} \left[W^{m'}(s) - W^{m'}_0 \right]^{b^{m'}}$$

where β^m is m's share in total GDP.

In each formation of coalition, we check an individual rationality constraint (each member of the coalition obtains a gain in the formation of this coalition).

We demonstrate that the G22, the G10 and the EU_25/USA coalition does not modify the bargaining process defined in the previous subsection.

We systematically study the impact of coalition formation, by analyzing what is the agreement obtained in all possible partitions.

4. Trade negotiations, coalitions and redistributive objectives

4.1. Trade liberalization and redistributive costs

We consider the following objective function G^m for each zone m:

$$G^m(s) = a^m \hat{W}^m - SC^m \qquad (3)$$

The objective function of m's country is the addition of two elements:

- the first one is the rate of variation of national welfare weighted by a parameter which reflects the government concern with this objective;
- the second element is a social cost associated with the liberalization process.

The social cost of the liberalization process is measured by the sum of the squares of remuneration losses, weighted by the importance of each factor. It is measured either at the sector level, or the factor level.

Justification of this social cost function: to be completed.

Implications and interpretation of the sector level- social cost indicator and the factor level- social cost indicator: to be completed.

Measure of coefficient a^m: we use the product dispersion of protection as a proxy of this coefficient. When this dispersion is high, we consider that the government is strongly influenced by lobbies and that its weighting of national welfare (a^m) is low. When this dispersion is low, we consider that national governments use trade policy as macroeconomic policy and not redistributive policy such that their weighting of national welfare is high.

4.2. Trade negotiations and variation of real remunerations at the sector level

We demonstrate that when the social cost is defined at the sector level, no agreement is possible (no scenario respects the individual rationality constraint).

4.3. Trade negotiations and variation of real remunerations at the factor level

We study trade agreements when a social cost-national welfare function is utilized by each government in the following cases:

- a Nash solution without bargaining powers
- a Nash solution with bargaining powers
- the impact of G22, G10, EU_25/USA coalitions
- the impact of any coalition.

5. Conclusion

To be completed

6. Bibliographie

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Annex 1:…