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The determinants of the success of economic sanctions

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The Determinants of the Success of Economic Sanctions

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Abstract

With the liting of economic sanctions against Iran and the renewal of sanctions against Russia, this diplomatic tool attracts considerable attention from the media. This paper aims at identifying the determinants of the success of economic sanctions through an econometric analysis on 204 sanction cases between 1914 and 2002. Among the variables that have an effect on the probability of success, it highlights the important role played by the sanction's economic instrument. Sanctions affecting trade flows asymmetrically, targeting the ones that contribute to increasing the target country's reserves, are far more successful.

I. Introduction

One of the most famous early uses of economic sanctions occurred as early as 432 B.C. when Pericles issued the "Megarian decree"that limited the entry of products from Megara into Athenian markets. The political reason for the decree was the Megarians'supposed trespass on sacred sites and the killing of the herald who was sent by Athens to Megara to reproach them. Thus, economic sanctions are an age-old tool of statecraft that has been used for centuries. However, military instruments have often been thought as the only tools capable of actually altering another country's behavior. After World War I, sanctions began to appear as a credible alternative to the use of force. They were considered as a potential "*economic, peaceful, silent, deadly remedy*", in the words of Woodrow Wilson. Nowadays, the use of economic sanctions is becoming more frequent and those can even target large-scale economies such as Russia or Iran. According to the study conducted by Gary Hufbauer, Jeffrey Schott, and Kimberly Ann Elliott and published in 2007 [16], 174 cases of sanctions were started between 1914 and 2000. The increasing use of this tool has generated substantial discussion in policy and academic circles, addressing the following issues:

(i) Can sanctions be successful, and for what purposes?

(ii) Which variables do affect the degree of effectiveness?

The question addressed in this paper is whether economic sanctions are an effective tool for achieving international political goals, and if so, under which conditions. Among the conditions, we are particularly interested in the type of instruments used for the sanction. A background paper has been published by the French Treasury, suggesting that economic sanctions that have a real impact are primarily sanctions that significantly undermine the target country's balance of payments (Lettre Tresor Nº150, 2015 [29]). This paper aims at testing this hypothesis.

We begin by discussing and specifying the definition of economic sanctions and the type of objectives that we consider in this paper. Then, we present the HSE database that constitutes the bedrock of this analysis and introduce the variables that we are using. The next step is the presentation of the model that we developed to explain the determinants of the success of economic sanctions. One of the core variables included in the model is the type of economic sanction implemented, gathered in categories that are more precise than the simple "exports", "imports"or "financial"sanctions. Then come the results, the robustness checks and the conclusion.

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Contents

II. Economic sanctions: definition and objectives

i. Definition

To evaluate the success of economic sanctions, it is necessary to clarify the type of objectives set and specify the exact meaning of an economic sanction. HSE define economic sanctions as "*the deliberate, government-inspired withdrawal, or threat of withdrawal, of customary trade or financial relations. 'Customary'does not mean 'contractual'; it simply means levels of trade and financial activity that would probably have occurred in the absence of sanctions.*"However this definition is incomplete since the idea that the sanction shall serve a specific objective is lacking. Thus, we define sanctions as *the deliberate, government-inspired withdrawal, or threat of withdrawal, of customary trade or financial relations in order to attain a political objective*. As Hufbauer, Schott and Elliott (2007)[16] and Pape (1997)[27] do in their analysis, this paper excludes trade disputes from the universe of sanctions. Trade disputes cannot be considered as sanction episodes since the economic measures do not serve political or diplomatic purposes but purely economic ones. The decision making process is much different. In trade disputes, countries make their decision through a wealth maximization problem whereas countries subject to sanctions or implementing sanctions do have to assess if the political objectives are worth the economic costs incurred. However, it is important to precise which type of political objective is sought by the sanction.

ii. Objectives

As detailed by Lindsay (1986)[21], sanctions can serve multiple kinds of aims namely compliance, subversion, domestic symbolism, deterrence and international symbolism.

- The first objective -*compliance*- is the most obvious and restrictive one: make the target government alter its political be-

havior. For example, in 1935 (case 35-1), the League of Nations sanctioned Italy to make the country withdraw its troops from Abyssinia. The effect can be more or less straightforward. Sanctions can directly convince the target government that the issues at stake are not worth the price, leading it to change its policy. The effect can also be intermediated: inducing popular pressure to force the government to concede, or even inducing a popular revolt that overthrows the government, and replaces it by another government that will make the concessions (Galtung 1967 [13]).

- The second objective *-subversion-* can be understood as the removal of the target country's leaders (leaving the political system intact) or the overthrow of the entire regime. The case United States vs Cuba in 1960 (case 60-3) is a good example since one of the objectives sought by the U.S. was the destabilization of the Cuban regime.
- The third one is *domestic symbolism*: increasing its internal support or addressing internal criticisms of its foreign policies. This theory is supported by David Baldwin (1985)[2] and Irfan Nooruddin (2002)[25] who explains: "*the audience to which the sender is performing in enacting the sanction might not be the target state at all, but rather the domestic interest group lobbies that demand something be done against the target state*". The example of Cuba can also be used to illustrate that type of objective. Considering the instrumental role of sanctions, the aim was to destabilize Castro. Considering the expressive one, the story is different. Many Cuban immigrants living in Florida resent the Castro dictatorship and lobby extensively for the maintenance of sanctions against Cuba. Hufbauer, Schott and Elliott [16] identify another domestic goal of sanctions. In a rising international dispute, they can be used to prepare the public opinion for sterner measures (military intervention for instance) by galvanizing public support or inflaming patriotic fervor.
- The fourth objective is *deterrence*. A sanction episode can aim at dissuading the target country or even other countries from repeating the disputed action in the future. Cases related to the objective of nuclear non-proliferation are good illustrations of this.
- The last objective is *international symbolism*, i.e. sending messages to other members of the world community. Through sanctions, the sender country can show its resolution or express its disapproval of a regime. This kind of "demonstration of resolve"is a particularly important objective for the United States. The U.S. commonly deployed sanctions to reassert its leadership in world diplomacy, even when the probability of success was small. In this framework, sanctions are imposed because the political cost of inaction (in terms of loss of confidence at home and abroad in the willingness or capability of the sender country to act) is seen as greater than the economic cost of the sanctions[16].

This article concerns itself less with the motivations behind sanctions than with their outcomes. However, the issue of the motivations cannot be eluded since it is necessary to know the actual objective of a sanction episode to assess if it was successful and to explain which factors determined the outcome. The second objective *-subversion-* can be melted in the first objective *-compliance-*. In this case, the change of policy required by the sender countries is a "regime change". The third objective *-domestic symbolism-* is widely discussed in the literature, but it will not be the case in this paper. We choose to assess the effectiveness of sanctions as a diplomatic tool and as an alternative to military force, not as way to solve problems of internal politics. It is also impossible, or at least very difficult to assess the success of sanctions with respect to the fourth or fifth objectives (deterrence and international symbolism). Despite the different thinking leading to the sanctions, the outcome is observationally equivalent, namely a sanction against

some target. Leaders justify sanctions in diplomatic terms, and never as a means of retaining office. On balance, we agree that the implementation of sanctions conveys multiple signals. Nonetheless, in assessing the success of an episode and thereby the effectiveness of economic sanctions, the paper uses the same methodology as HSE[16] and restricts the examination to changes in the target country's policies or regime (first and second objectives).

iii. Success rates

The first major wave of research on the topic of sanctions (in the 1960s and 1970s) reached a consensus that they were not as effective as military force; for instance Galtung (1967) [13] with examples from the case of Rhodesia, Doxey (1971) [10], Knorr (1975) [19] or Losman (1979) [22]. Baldwin (1985) [2] remarked that "*it would be difficult to find any proposition in international relations literature more widely accepted than those belittling the utility of economic techniques of statecraft*". In the 1980s, a new wave of research questioned the ineffectiveness of economic sanctions. Even if they have their limitations, they estimated that sanctions could achieve ambitious political objectives. A key evidence supporting the argument was the study conducted by Gary Hufbauer, Jeffrey Schott, and Kimberly Ann Elliott (hereafter HSE). With the publication of Economic Sanctions Reconsidered in 1985, scholars had access for the first time to a large-n dataset of sanction cases. In the last edition of their study (2007)[16], HSE obtained a success rate as high as 34%. However, in his study based on the 1990 version (second edition) of HSE database[15] and applying a narrower definition of success, Robert Pape (1997)[27] obtained a success rate of 4% only. The reassessment of the efficacy using a definition of success that is narrower than HSE's one but less extreme than Pape's one leads to a rate of 17.6% (36 successes out of 204 cases).

III. Data

i. HSE Database

The database built by Hufbauer Schott and Elliott in the 2007 edition of their book [16] lists 174 cases of economic sanctions, from the blockade of Germany by the Allies during World War I (1914) to the threat by the Organization of American States (O.A.S.) and the United States to impose sanctions against Ecuador in 2000 so as to reverse the coup against President Jamil Mahuad. When a case had two target countries or two equally important objectives, it was divided into two separate cases in the HSE database. That explains why the 174 historical cases appear as 204 different cases in the database. For each case, the authors assigned two grades, each one scaled from 1 to 4. The first component assesses the extent to which the political objective was achieved (1 being a failed outcome and 4 a positive outcome where the goals were largely realized). The second one is about the sanctions'contribution (1 being a negative contribution and 4 a decisive contribution). The two components are then multiplied: if the score is 9 or above (meaning that sanctions made at least a substantial contribution to the goals that were at least partially realized), the case is a success. In each case, the authors used the work of scholars and the material produced by observers to draw their conclusions on the outcome and on the contribution of sanctions. The authors chose to use outside opinions in assessing the success to minimize the bias related to their views on the efficiency of economic sanctions.

ii. From Pape's criticisms to the reassessment of success

The study conducted by HSE[16] can be seen as a main reference on the subject, due to the size of the sample (204 cases) and to the number of variables considered. However, the methodology used in the study has been strongly criticized by Robert Pape (1997)[27]. Criticisms are

of four kinds:

- In several instances, the political objective sought by the sanction was not achieved (for instance, Egypt eventually refused the international control of the Suez Canal, despite the sanctions imposed by the U.K., the U.S. and France);
- In many other cases, the causality between the change of policy and the economic sanctions has not been proved. For instance, HSE considered that economic sanctions were decisive in the victory of the Allies against Germany in 1945 or in the overthrow of Allende in 1973. Actually, according to Pape, the use of force was far more determinant in achieving the outcome than the sanctions;
- The way of discriminating successes and failures (the simple multiplication of two arbitrary grades) is extremely rough;
- Trade disputes have to be excluded from the sample since they do not fit with the definition of economic sanctions and have a higher success rate.

With his criteria applied to the database, Pape obtained a rate of success of 4% only. Even if the criticisms that were developed by Pape are generally acceptable, the way he assessed causality reflects a maximalist approach (in case of doubt, sanctions were not considered as determinant in achieving the positive outcome). This paper adopts an intermediary position about causality :

- an episode in which a military action or a guerilla was decisive cannot be considered as a success; however
- an episode in which the economic sanction exerted important pressure and in which it is impossible to identify another factor that clearly determined the outcome is considered as a success.

The paper investigates economic sanctions as an alternative to military force, and not as a complement. To do so, this paper uses a reassessed *Success*variable that is dichotomous, taking value 1 if the case is a success of economic sanctions (with the criteria detailed above) and 0 otherwise. Thus, 36 cases (out of 204 case) are considered as successes in the reassessed database (details are given in Appendix).

iii. Remaining Biases

Sender Countries	Number of cases
Unilateral sanctions	
US only	83
USSR or Russia only	15
OECD country only	20
European non OECD country	0
Latin American country only	0
Middle East country only	0
Asian country only	8
African country only	2
Multilateral sanctions	
OECD countries	31
Arab League	5
Other coalitions	13
Universal sanctions	
League Of Nations or UN	27

Table 1: *Table of economic sanctions, by sender countries Source: HSE, Economic sanctions reconsidered, 3rd ed, 2007*

In 134 of the 204 cases indexed in the HSE database, the senders were OECD countries (Table 1). Thus, it suggests that economic sanctions was mainly used by Western countries. This might be true but it also highlights one of the weaknesses of the database. It is likely that many cases that happened in non-Western countries were omitted due to a lack of reliable data. These instances are poorly documented in English and concern small scale economies.

There exist other sources of biases: the absence of cases in which threats were not implemented and were made privately or the absence of cases in which the objectives and the sanctions were secret. Therefore,

the dataset does not perfectly represent the whole universe of economic sanctions decided between 1914 and 2000. However, it remains extremely useful to, at least, understand economic sanctions made public.

Observed cases of sanctions reflect the instances when governments chose to confront each other economically rather than to settle their differences diplomatically or militarily. This article is guilty of a mistake that is common and almost inevitable in the sanctions literature: selection bias. Since the database contains actual instances of sanctions, there is no information on cases in which sanctions might have been considered but not used for strategic reasons, leading to a selection bias. As explained by Steve Chan (2009) [6] "*a sanction's occurrence and its outcome are therefore not independently determined*". As a consequence of that, this study cannot solve the general problem of sanction's efficacy in a given situation. However, it can explain the determinants of success of a sanction once the decision has already been made to use it. All the same, we chose to base the study on the HSE dataset to make the results comparable to those of the many other analysis that use the same database.

iv. Explicative Variables

In the initial database developped by Hufbauer Schott and Elliott [16], there were 39 variables for 204 cases of sanctions. Twelve explicative variables have been selected. This choice has been made according to two criteria:

- the selected variable has proven relevant in theoritical or empirical studies related to economic sanctions;
- or this variable has been built by the authors to test the following hypothesis: sanctions have greater chances to succeed when the instrument is well-designed. Practitioners of economic sanctions at the French Ministry for the Economy and Finance wanted to test it through a large-N empirical study.

While this section only describes the chosen variables, the theory behind this choice of variables and the model underlying it will be discussed in the next section.

Economic cost of sanctions borne by the target country (*CostTarget* in the database)
To compute the economic cost, the authors tried to estimate the initial deprivation, as an annual cost in current dollars. Then, they applied a judgmental "sanctions coefficient"that was specific to each case. For instance, a loss of development aid usually has a coefficient of 100%: the loss is total. On the other hand, trade restrictions have lower coefficients due to a generally greater substitutability. In the end, the cost to target represents the average loss (in percent of GDP) over the period of implementation.

Regime type of the target country (*Regime* in the database)
This discrete variable has been built using the *Polity IIId* datasets. Every regime was analyzed by Gurr and Jaeger (1995)[14] according to five dimensions:

- The influence relations between superordinate and subordinate strata;
- The degree of inequality between the strata;
- The institutional relations among superordinates;
- The competitiveness of recruitment to superordinate positions;
- The basis of political legitimacy, whether personal, substantive or procedural.

They have created a single summary measure that ranges from -10 for states that are absolutely autocratic to +10 for states that are completely democratic. For the sake of the analysis, this index has been compressed to create a scale running from 1 (autocracy) to 3 (democracy).

Restrictions targeting mainly	Nb of cases (of which threats)	Nb of successes (of wich threats)	Success rate
Imports of the target country			
Supply of raw material or nuclear technologies linked to the non-proliferation objective	12 (2)	3 (1)	25%
Partial embargo on supplies to the target country	21	1	5%
Military aid or arms supply	19	1	5%
Exports of the target country			
Very specific goods and services (procurement contracts, etc.)	6 (1)	2 (1)	33%
Trade barriers (tariffs, etc.)	6 (1)	1	17%
Major export resource (hydrocarbons sector, agricultural products, etc.)	13 (1)	7 (1)	54%
All the exports or large market access restriction	7	4	57%
Total trade			
Trade embargos during periods of war	9	0	0%
Other total trade embargos	16	3	19%
Other restrictions affecting both the exports and the imports	7	1	14%
Financial flows			
Modest scale: economic bilateral aid and/or multilateral aid/credits	21 (2)	1	5%
Large scale: economic bilateral aid and/or multilateral aid/credits	41 (1)	9 (1)	22%
Access to dollar credits to pay for oil imports	1	1	100%
Others (asset freezing, restrictions on investment, withholding of payments, etc.)	8	0	0%
Large scale combinations of trade and financial restrictions	12 (3)	1	8%
Atypical cases: Antiboycott law, expulsion of workers, etc	5	1	20%
Total	**204 (11)**	**36 (4)**	**18%**

Table 2: *Table of economic sanctions, by sender countries*
Source: author, based on HSE, 2007, Economic sanctions reconsidered, 3rd ed

Prior diplomatic relation between the target and the sender countries (*PriorRelation* in the database)
Diplomatic relation is summed up in an index built by Hufbauer Schott and Elliott, reflecting the relation between the sender and the target countries before the case. 1 is *antagonistic*: the countries were "in opposing camps", 2 is *neutral*: the sender country "did not have strong ties to the target, but there was a workable relationship without antagonism", 3 is *cordial*: the two countries were "close friends and allies".

Relative economic size of the countries (*GnpRatio* in the database) This variable measures the relative economic size of the countries, computed as the ratio of the sender's GNP to the target's GNP.

The economic and political atmosphere in the target country (*HealthStability* in the database)
The economic and political environment prior to the case is captured by a judgmental index created by the authors, running from 1 to 3. 1 is *distress*: "a country with very severe economic problems coupled with political turmoil"; 2 is *significant problems*: "a country with severe economic problems coupled with substantial internal dissent"; 3 is *strong and stable*: "a country with the government in firm control and an economy experiencing only the normal range of inflation, unemployment and similar ills".

Level of cooperation with the sender countries (*CooperationLevel* in the database)
Cooperation with senders is measured by an index created by HSE running from 1 to 4. 1 is *no cooperation*: a single country with no cooperation; 2 is *minor cooperation*: verbal support and possibly token restraints from other countries; 3 is *modest cooperation*: meaningful restraints but limited in time and coverage from some but not all the important trade partners of the target country; 4 is *significant cooperation* : major and coordinated effort by important commercial nations to limit trade and/or finance.

Level of cooperation with the target country (*SupportTarget* in the database)
This variable is similar to the previous variable but is related to the target country. The existence of alternative markets or financing sources are not counted as assistance. What matters here is overt rhetorical support with economic or military aid to the target country following the imposition of sanctions. The degree of international assistance provided to the target country is not scaled: the variable is dichotomous. However, the amount of offsetting assistance is taken into account in the *CostTarget* variable.

Commercial relation between the countries before the episode (*TradeLinkage* in the database)
This variable has been designed by Hufbauer, Schott and Elliott ([16]). It equals the average of pre-sanction target-country exports to the sender country as a percentage of total target-country exports, and imports from the sender country as a percentage of total target-country imports.

Cost of the sanction borne by the sender countries (*CostSender* in the database)
Due to the difficulty to estimate precisely the cost of economic sanctions, Hufbauer, Schott and Elliott chose to sum up the costs borne by the sender countries in a judgmental index, scaled from 1 to 4. 1 is *net gain to sender*: mainly aid withholding; 2 is *little effect on sender*: where there was a "net economic gain to the sender, little public commentary and where a trivial dislocation of trade occurred"; 3 is *modest loss to sender*: where "some trade was lost but without any political backlash", 4 is *major loss to sender* where "large volumes of trade were adversely affected, causing a distinct backlash among affected firms and communities".

Ambition of the political objective (*PoliticalAmbition* in the database)
HSE have identified many different political objectives sought by sanctions. In this paper, we chose to gather them in fourteen subcategories, merged to form four categories corresponding to different levels of political ambition. From these four levels, we created the discrete variable *PoliticalAmbition*.

Type of instrument: sanctions that have a strong impact on target-country exports (*StrongExports* in the database)
HSE distinguish 3 types of sanctions in their database: export sanctions, import sanctions and financial sanctions. They can be used alone or in combination. For this paper, it appears important to be more precise than this simple distinction.
Sanctions vary in many aspects from case to case and are so specific that their effects can only be fully understood through a microeconomic study. However, in a large-n study, it is necessary to lose some information to be able to draw general conclusions. Thus, in this paper, each case has been analyzed individually to identify the main sanctions implemented. Then, they have been gathered in fourteen categories, themselves merged in seven broader classes of sanctions: sanction affecting imports, military, exports, whole trade, financial, combination of trade and financial, atypical sanctions. Details are given in Appendix. For the need of the econometrics part, this variable is one of the two variables that have been specifically created for this study. *StrongExports* gathers the sanctions affecting one of the main resources exported by the target and the sanctions prohibiting all exports or at least restricting them largely. This dichotomous variable indicates whether the main sanction implemented has a strong effect on target-country exports. It takes the value 1 when the main sanction implemented affects a major export-resource (oil products, agricultural products, etc.), affects all exports or creates a large market access restriction.

Large financial sanctions (*StrongFinancial* in the database)
This dichotomous is very similar to the previous one, regarding sanctions affecting strongly the financial part. The dichotomous variable indicates whether the main sanction implemented affects financial flows on a large scale.

IV. Conceptual framework

i. General Model

The outcome of a sanction episode, as considered in the reviewed database, is either successful or unsuccessful. The standard framework for analysis is the following: the costs of defiance borne by the target must be greater than its perceived costs of compliance to succeed. This idea can be translated in terms of utility functions. A given episode has the following characteristics (period, relation between the countries, type of economic sanction, political objective, etc.). It is assumed that compliance brings a utility $U(1, X_i)$ to the target$i$. As a matter of fact, compliance implies a political sacrifice for the target government (need to change policies, admission of failure, etc.) and brings rewards (avoidance of economic costs imposed by sanctions, improvement of the relations between the countries, etc.). The pros and cons of compliance are summed up in $U(1, X_i)$. The reasoning is similar for the utility $U(0, X_i)$ associated to non-compliance.

Thus, the condition for the case to succeed is:
$U(1, X_i) > U(0, X_i) \Leftrightarrow U(1, X_i) - U(0, X_i) > 0$
However, each government's utility function is unknown and cannot be directly deduced from the dataset. What is observed is a dichotomous variable Y_i ($Y_i = 1$ if the case is a

success and $Y_i = 0$ otherwise). Ordinary least squares (OLS) regression has been shown to be inadequate when the dependent variable is discrete (Collett, 1991[7] and Agresti, 1990 [1]). A binary outcome model like the probit analysis is more appropriate in this case. Since the dependent variable is dichotomous, it is necessary to introduce a latent variable Y^* (unobservable). Thus

$$Y_i = \begin{cases} 0 & Y_i^* < 0 \\ 1 & Y_i^* \geq 0 \end{cases}$$

where $Y_i^* = X_i \cdot \beta + \epsilon_i$
β is the vector of coefficients associated to the explanatory variables and ϵ_i is the error term, normally distributed ($\epsilon_i \sim \mathcal{N}(0,1)$). The probability of a success is thus a nonlinear function of several explanatory variables (the matrix X_i), that can be discrete (for instance the type of instrument) or continuous (like the cost to target as a percentage of GDP). Here we assume that the model is a probit. Hence $Pr(Y_i = 1) = \Phi(X_i \cdot \beta)$ where Φ is the normal cumulative distribution function.

ii. Choice of Variables

Economic cost of sanctions borne by the target country (*CostTarget* in the database)
Most of studies related to sanctions consider that the more severe the economic measures, the higher the probability of success (Drury, 1998)[9]. This assertion is a central tenet in what Drury named the "*conventional wisdom*". Conversely, other researchers like Galtung (1967)[13] estimate that the hardship caused by sanctions creates a "*rally 'round the flag effect*". The intensity of sanctions increases political integration and unity within the target country, enabling the leader to better resist. Thus, it appears plausible to think that *CostTarget* can have a significant effect on the probability of success. However the effect can be either positive or negative, depending on which theory is the most accurate.

Regime type of the target country (*Regime* in the database)
In the present model, the economic cost of sanction is compared to the political cost of compliance. However, what matters is the cost borne by the target's ruling coalition. As explained by Brooks (2002)[4], the effect of a given economic measure can be different according to the political regime in the target country. "*Autocrats seldom bend under pressure from sanctions, while democratic leaders are more easily swayed.*"In democracies, since leaders are elected, they need to have support from voters. Thus, comprehensive sanctions that harm the economy will be effective against democratic states, whereas authoritarian leaders tend to be insulated from aggregated pressures. Instead, these leaders are more likely to respond to more selective sanctions instruments that directly target the supports of the ruling coalition such as the military. Therefore, there could exist an effect, at least indirect, that relates the regime type to the success of a sanction episode.

Prior diplomatic relation between the target and the sender countries (*PriorRelation* in the database)
Allies have more to lose diplomatically and economically than enemies in a sanction episode. It is true that allies have greater chances to be close trade partners than enemies. However, the closeness of economic ties between the countries is already in the model as a separate variable *TradeLinkage*. Nonetheless, there exist other aspects of friendly relations that could affect effectiveness: it is for instance less humiliating for a country to comply with an ally's requirement than to kneel down before a hostile country (Bonetti, 1998 [3]; Lam, 1990 [20]; HSE, 1990 [15]).

Relative economic size of the countries (*GnpRatio* in the database)
HSE estimate that large countries are more likely to use sanctions against smaller economies [16]. However, it does not imply

that the relative size is significant in the present success model. As a matter of fact, size differential should not be related to sanction effectiveness since it does not convey any important information. It says nothing about the trade or financial linkages (leverage) between the two, or about the severity of the sanctions. The model will be able to test if the size differential has an independent effect on success rates.

The economic and political atmosphere in the target country (*HealthStability* in the database)
To face sanctions optimally, the target country has to be able to evade them, by finding alternative suppliers or domestic substitutes for the goods sanctioned. Less stable countries should have more difficulties to do so since a weak targeted nation should be unable to correctly control its economy. Moreover, if the economy is already fragile before the sanction episode, the target country will be more susceptible to economic pressure. Thus, the economic and political stability in the target country can have a negative effect on the outcome of a sanction episode (HSE, 1990 [15]; Lam, 1990 [20]; van Bergeijk, 1994 [30]).

Level of cooperation with the sender countries (*CooperationLevel* in the database)
Cooperation with the sender countries should increase the effectiveness of sanctions: it limits substitutability and makes the sanction more severe. However, the literature indicates that the opposite is the case (Doxey 1971 [10]; Doxey 1996 [11] and Drury 1998[9]). Different arguments could explain this result. It is difficult to organize collective action; and coordination or cooperation problems are aggravated with the number of nations involved. Another problem is the fact that cases involving many countries generally concern more ambitious objectives. Therefore, it is difficult to assess the effect of cooperation on success without controlling for other factors.

Level of cooperation with the target country (*SupportTarget* in the database)
Helping the target country can make it evade sanctions more easily and can lower the effects of political and domestic isolation. The presence of a black knight can thus lower the economic costs of the sanction. As a consequence, it would lower the probability of success.

Commercial relation between the countries before the episode (*TradeLinkage* in the database)
Closer economic ties imply a higher leverage for the sender. Moreover, the variable *TradeLinkage* is computed as the average of pre-sanction target-country exports to the sender country as a percentage of total target-country exports, and imports from the sender country as a percentage of total target-country imports. Thus, this variable measures the reliance of the target country on the sender country. The more dependent, the stronger the leverage, the higher the pressure.

Cost of the sanction borne by the sender countries (*CostSender* in the database)
In their study, Morgan and Schwebach (2002)[24] estimate that high costs to the target increase effectiveness, while high costs to the sender decrease it. A sanction regime that involves high costs to the sender should be harder to sustain and might create a political backlash within the sender country. It would thus have a negative effect on success. On the other side, if it is considered that an expensive sanction is a show of the sender country's political resolve, the effect of the cost borne by the sender on the success can be opposite. Thus, the cost to the sender is a variable that can have a significant effect on the effectiveness of a sanction regime but it is hard to guess its sign.

Ambition of the political objective (*PoliticalAmbition* in the database)
For a sanction to succeed, the political cost of

compliance has to be lower than the economic cost borne by the target government. In this simple framework, a more ambitious political objective will increase the cost of compliance for the target. It is easy to imagine that, for a given sanction, a given leader will be less likely to comply with a regime change than with a release of hostages.

Type of instrument: sanctions that have a strong impact on target-country exports (*StrongExports* in the database) and **large financial sanctions** (*StrongFinancial* in the database)
On a preliminary basis, each case has been reviewed to identify the main sanctions implemented and to sort them in broad categories. Then we have computed a conditional success rate as a function of the main sanction implemented.
The results are set out in Table 2. The table suggests that the success rate is higher for the sanctions that strongly affect the exports of the target state, i.e. the restrictions affecting mainly a "Major export resource"or "All the exports or large market access restriction". Similarly, large financial sanctions seem to have greater success rates. These results are fully in line with the hypothesis that this study aims at testing. In the French Ministry of the Economy and Finance, it is considered that economic sanctions that have a real macroeconomic impact are primarily sanctions that significantly undermine the target country's balance of payments (Tresor Economics Nº150, 2015 [29]). More specifically, only major financing restrictions that have a negative effect on the target country's capital account and/or affect the target country's cost of borrowing, or trade embargos on the target country's key exports that have a negative effect on its balance of trade have the potential to produce a powerful impact on the balance of payments. The univariate analysis displayed in Table **??** seems to confirm this result. However, it is important to incorporate the variables *StrongExports* and *StrongFinancial* in the model to observe whether there exists a direct effect of the type of instrument implemented or if this effect depends on other variables.

V. Results

Two different empirical models have been developped. In the first model, all of the variables that could play a role in explaining the success of sanctions have been included. We described these variables above. They are variables that have proven successful in other studies or variables that are used to test the hypothesis that the instrument used for the sanction is of primary importance in determining the success of the episode.
The second model includes only a subset of the previous variables. To choose that model, all of the possible models including the twelve variables have been tested ($2^{12} = 4096$ possibilities) through an algorithm that has selected the one minimizing the Akaike Information Criterion (Burnham and Anderson, 2002)[5]. The two models yield comparable results. They are reported in Table 3. Some of the coefficients obtained are in line with expectations while others are more surprising.

i. Variables that have a significant effect

Ambition of the political objective (*PoliticalAmbition* in the database)
As expected, the more ambitious the objective, the less probable the success. For a sanction to succeed, the political cost of compliance has to be lower than the economic cost borne by the target government. There exists a direct correspondence between the ambition of the objective sought and the political cost of compliance for the target country. This variable is highly significant in the model.

Type of instrument: sanctions that have a strong impact on target-country exports (*StrongExports* in the database)
The sign (positive) of the coefficient obtained for this variable appears in line with the

	Dependent variable:	
	Success	
	Full model	Min AIC model
PoliticalAmbition	-0.623***	-0.618***
	p = 0.0003	p = 0.0002
StrongExports	0.947**	0.895**
	p = 0.042	p = 0.043
PriorRelation	0.529**	0.515**
	p = 0.018	p = 0.012
TargetRegime	0.317*	0.316*
	p = 0.087	p = 0.071
TradeLinkage	0.011*	0.011*
	p = 0.077	p = 0.054
GnpRatio	-0.0001	-0.00005
	p = 0.361	p = 0.311
CostTarget	0.014	0.013
	p = 0.494	p = 0.506
StrongFinancial	0.216	
	p = 0.567	
CooperationLevel	-0.085	
	p = 0.611	
SupportTarget	-0.470	
	p = 0.321	
CostSender	0.036	
	p = 0.874	
HealthStability	-0.135	
	p = 0.566	
Constant	-1.129	-1.469**
	p = 0.217	p = 0.034
Observations	180	180
Log Likelihood	-53.312	-54.612
Akaike Inf. Crit.	132.624	125.223
Note:	*p<0.1; **p<0.05; ***p<0.01	

Table 3: *Probit Results*

univariate analysis presented in Table 2. It is however particularly important and innovative in the study. It highlights the key role played by the type of instrument implemented, whose importance is often underestimated (Lettre Tresor Nº150, 2015)[29]. Sanctions that have an important macroeconomic effect are the ones that significantly affect the balance of payments. In other words, for maximum economic effectiveness, a sanctions policy must affect trade flows asymmetrically, targeting the flows that contribute to increasing the target country's reserves, such as export flows out of the target country.

Prior diplomatic relation between the target and the sender countries (*PriorRelation* in the database)
Success is more probable against a former ally than against a former enemy. This result is intuitive and several underlying mechanisms could explain it. Firstly, the effect can go through the political cost of compliance: it is less humiliating and costly for the leader to comply with an ally's requirement. Secondly, the effect can be intermediated by the cost of sanctions. This cost is broader than the simple cost to target (in terms of GNP) that is already included in the model through the variable *CostTarget*. Losing an ally is losing some diplomatic support and prospects for future cooperation.

Regime type of the target country (*Regime* in the database)
A sanction against a democracy is more effective than against an autocracy. As explained by Huffbauer Schott and Elliott [16]: "*it is hard to bully a bully with economic measures*". Sanctions that impose costs only on the masses, leaving elites unscathed are less likely to succeed since it is the elite that makes policy decisions. However, as underlined by Nooruddin (2002)[25] "*the type of regime in place mediates the relationship between masses and elites*". In democracies, reelection is an important component in the political decision making process. Thus elites are not insulated from sanctions that harm the masses. The relation between the economic cost borne by the target country and the cost of sanctions as considered by the leader is more straightforward in democracies (Farmer 2002)[12].

Commercial relation between the countries before the episode (*TradeLinkage* in the database)
This variable measures the reliance of the target country on the sender country. More dependence implies a higher leverage for the sender country. When leverage is high, the coerced leaders know that the sender country can easily turn the screw and increase the pressure on the domestic economy. While *CostTarget* measures the actual costs of the sanction for the target country, *TradeLinkage* is an indicator for the potential costs that will happen if the target country does not comply. Similarly, Dashti-Gibson et al (1997)[8] have reported that dependency on the sender country contributes little to sanction success.

ii. Variables that have no significant effect

Relative economic size of the countries (*GnpRatio* in the database)
As expected, the GNP Ratio does not, in itself, convey a great deal of information. The effect of the economic size differential on the probability of success is not direct. Big economies often play key roles on financial and trade markets. Hence they have more leverage and should be able to implement tougher sanctions that are more difficult to evade. Therefore, the effect of *GnpRatio* on the probability of success can go through the leverage (*TradeLinkage*) or through the intensity of the sanction itself (*CostTarget* for the target and *CostSender* for the sender).

Economic cost of sanctions borne by the target country (*CostTarget* in the database)

	Dependent variable:
	CostTarget
StrongExports	9.023***
	p = 0.000
TradeLinkage	0.074***
	p = 0.0001
CostSender	1.627**
	p = 0.017
PoliticalAmbition	0.701
	p = 0.161
StrongFinancial	1.167
	p = 0.329
CooperationLevel	0.114
	p = 0.807
PriorRelation	-0.355
	p = 0.570
GnpRatio	0.00004
	p = 0.557
SupportTarget	-0.845
	p = 0.446
TargetRegime	-0.265
	p = 0.640
HealthStability	-1.151
	p = 0.101
Constant	-2.459
	p = 0.400
Observations	180
R^2	0.388
Adjusted R^2	0.348
Residual Std. Error	5.565 (df = 168)
F Statistic	9.668*** (df = 11; 168)
Note:	*p<0.1; **p<0.05; ***p<0.01

Table 4: *CostTarget analysis*

The result regarding this variable is probably the most counterintuitive of the whole analysis. Indeed, according to the standard view, sanctions work by inflicting economic damage on the target country to force the ruling regime to comply and to change its policy after a straightforward cost-benefit analysis. Hufbauer, Schott and Elliott obtained a positive coefficient for this variable in the 2007 edition of their book [16]. However, contrary to conventional expectation, high levels of deprivation does neither undermine a target's moral nor induce a political disintegration (Galtung, 1967 [13]). Our finding in this regard is in line with Kaempfer and Lowenberg's (1988)[18] public choice theory and Jing, Kaempfer and Lowenberg (2003)[17]. Table 4 helps us better understand the phenomenon. The variable *CostTarget* is strongly correlated to the variable *StrongExports*, meaning that the sanctions that hit strongly the exports of the target are the costliest sanctions. The variables *StrongExports* and *CostTarget* convey similar information, but *StrongExports* is a better predictor. Indeed, it is simpler, it provides some additional information about the balance of payments and is better constructed. *CostTarget* involves an important judgmental component: the "sanctions coefficient"that is estimated by Hufbauer Schott and Elliott specifically for each case.

Type of instrument: strong financial sanctions (*StrongFinancial* in the database)
While *StrongExports* has a significant effect on the success rate, *StrongFinancial* has no direct influence on this rate. Hitting strongly the financing of the target country is much less efficient than affecting its balance of payments through cuting its exports.

Level of cooperation with the sender countries (*CooperationLevel* in the database)
The level of cooperation with the sender country has no direct effect on success. This result undermines the assumption that a stronger international condemnation of the target country's behavior has a positive effect on success. It is also possible that two opposite effects cancel each other:

- on the one hand, more cooperation makes the sanction harder to evade;
- on the other hand, coordination and cooperation issues make the process slower and weaker. The more countries take part in the sanction episode, the harder it is to decide on a package of sanctions satisfaying all of the sender countries.

Level of cooperation with the target country (*SupportTarget* in the database)
An expressive support, either diplomatic or financial, to the target state has no effect on the success of the sanction episode.

Cost of the sanction borne by the sender countries (*CostSender* in the database)
This variable has no direct effect on success. It is counterintuitive since different transmission channels are credible. The cost borne by the sender country could have a negative effect on the success rate since a costlier sanction is harder to sustain and might create a domestic political backlash. The effect could also be opposite since a costly sanction sends a credible signal and constitutes a demonstration of resolve. Indeed, building a domestic coalition for costly sanctions requires convincing the domestic groups that the sanction will be successful. Since the effect of the variable is insignificant, either these opposite effects do not actually take place, or they cancel each other.

The economic and political atmosphere in the target country (*HealthStability* in the database)
Contrary to expected results, less stable countries do not have more difficulties to face sanctions by finding alternative suppliers or domestic substitutes for the goods sanctioned.

VI. Robustness Checks

Robustness is necessary to obtain valid causalities, thus we implement a series of tests and all of them are conclusive (Table 5).

i. Test 1: Logit Model (Column 2)

The link function is changed to implement a logit model. As expected, the coefficients do change, but not their sign. Despite small changes in the significance levels, the group of variables identified as significant by the Logit model is consistent with the estimation based on the Probit model.

ii. Test 2: Outliers (Column 3)

For their econometric analysis, Hufbauer, Schott and Elliott (2007)[16] dropped the three observations gathered in the case 90-1, relating to sanctions against Iraq. They deemed that the computed costs borne by the target state could be considered as outliers, threatening to bias the results. Indeed, their computed annual cost of sanctions (mainly the boycott of Iraqi oil) lied between 30% and 78% of the GNP. We decided to drop nine other cases that are highly atypical in the database. Those are the cases in which the sanction was used to support an ongoing war between the sender and the target. Those cases are: 14-1 (World War One), 39-1 (four observations relating to World War Two), 50-1 (two cases relating to the Korean War), 82-1 (Falklands War) and 83-4 (Grenada). The cases in which sanctions supported an ongoing military intervention cannot be compared to the rest of the database. In those nine cases, sanctions were not used as a diplomatic tool that constituted an alternative to military force but simply as a weapon among others to weaken and defeat the enemy. As in the previous test, there is no change either in the sign of coefficients, or in the variables that are considered as significant.

iii. Test 3: Trade Disputes (Column 4)

In agreement with the definition of economic sanctions stated in the first part of the paper, trade disputes should not be considered as economic sanctions. In trade disputes, countries make their decision through a wealth maximization problem whereas countries subject to sanctions or implementing sanctions do have to assess whether the political objectives are worth the economic costs. Moreover, the success rate for trade disputes is much higher than for the rest of the sample. We find that trade disputes have been successful for the sender in 56% of the cases (5 out of 9) while economic sanctions have only been successful in 16% of the cases (31 out of 195).The reincorporation of the nine cases of trade disputes in the sample yields similar results. As in the previous tests, there is no change either in the sign of coefficients, or in the variables that are considered as significant.

iv. Test 4: U.S. unilateral interventions (Column 5)

The U.S. are by far the predominant sender of economic sanctions. This could lead to biased coefficients in the model if there exists a direct effect of a U.S. intervention. The U.S. are the biggest player on the trade and financial markets and have the most powerful army. Thus, it appears necessary to control for a U.S. effect. However there is no meaningful change either in the coefficients, or in the variables that are considered as significant. The U.S. variable is not significant, meaning that the fact that the U.S. are the only sender country has no direct effect on the success of a sanction episode.

VII. Conclusion

This paper makes a contribution to the study of sanction efficacy in three ways. Firstly, it reassesses all the cases included in the database developed by Hufbauer, Schott and Elliott (a

	Dependent variable:				
	Success				
	(Probit)	(Logit)	(No war cases)	(Trade disp)	(US control)
PoliticalAmbition	-0.618^{***}	-1.144^{***}	-1.133^{***}	-1.118^{***}	-1.221^{***}
	p = 0.0002	p = 0.0003	p = 0.0003	p = 0.00005	p = 0.0002
StrongExports	0.895^{**}	1.416^{*}	1.410^{*}	1.530^{**}	1.634^{**}
	p = 0.043	p = 0.073	p = 0.073	p = 0.039	p = 0.047
PriorRelation	0.515^{**}	0.932^{**}	0.918^{**}	0.854^{**}	1.019^{**}
	p = 0.012	p = 0.015	p = 0.017	p = 0.021	p = 0.012
GnpRatio	-0.00005	-0.0001	-0.0001	-0.0001	-0.0001
	p = 0.311	p = 0.353	p = 0.352	p = 0.364	p = 0.378
CostTarget	0.013	0.029	0.028	0.027	0.032
	p = 0.506	p = 0.411	p = 0.415	p = 0.431	p = 0.371
TargetRegime	0.316^{*}	0.554^{*}	0.550^{*}	0.566^{*}	0.621^{*}
	p = 0.071	p = 0.082	p = 0.085	p = 0.066	p = 0.057
TradeLinkage	0.011^{*}	0.019^{*}	0.019^{*}	0.018^{*}	0.023^{**}
	p = 0.054	p = 0.058	p = 0.060	p = 0.071	p = 0.035
UsOnly					0.700
					p = 0.248
Constant	-1.469^{**}	-2.476^{*}	-2.452^{*}	-2.353^{**}	-3.032^{**}
	p = 0.034	p = 0.053	p = 0.055	p = 0.047	p = 0.027
Observations	180	180	172	187	180
Log Likelihood	-54.612	-54.713	-54.647	-59.097	-54.033
Akaike Inf. Crit.	125.223	125.425	125.295	134.193	126.065
Note:					*p<0.1; **p<0.05; ***p<0.01

Table 5: *Robustness checks*

main reference on the subject of economic sanctions) and applies to them a definition of success that is more precise than the one used by the three authors in their book. This reassessment incorporates some of the critics made by Robert A. Pape about the second edition of the book. It also extends Pape's work to the new cases presented in the third edition of the book. Secondly, the reassessed database is used to test the conclusions put forward in earlier studies, confirming some of them while undermining others. Thirdly, three new variables have been created and two of them have high levels of significance. The first one measures the political ambition of the objective sought by the sender country from one to four. The more ambitious the objective, the smaller the chances of success. The second significant variable is a dummy variable that takes the value one when the main sanction implemented strongly affects the exports of the target state. The paper highlights the importance of the type of instrument in the sanctions'efficacy. The sanctions that harm the exports of the target country have much greater success rates, all other things remaining equal.

Our findings also signal a direction for future research on sanctions. While the HSE database has long been considered as the main reference on the subject of economic sanctions, it appears necessary to reconsider some of the claimed successes. Moreover, the type of sanction implemented is a key variable that may deserve more attention from scholars.

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VIII. Appendix A: Details of the reassessments of the successes

APPENDIX A: Details of the Reassessment of the Successes

Case	Objective Ambition /4	Main sanctions	Comments / explanation

Cases that we consider as successes, agreeing with Pape (5)

Case	Objective Ambition /4	Main sanctions	Comments / explanation
33-1 United Kingdom vs U.S.S.R. 1933	Release two British citizens 1	Embargo on imports	In 1933, the Soviet Union agreed to release six British nationals accused of spyin. The U.K. implemented small-scale sanctions but the objective was modest as well. Moreover the sender had an important leverage since the U.K. accounted for more than 20% of total Russian exports.
75-1 United States, Canada vs South Korea 1975–76	Forgo nuclear reprocessing 3	U.S. threatens to block South Korea's purchase of reactors for peaceful purposes	South Korea cancelled plans to purchase reprocessing plant in 1976. Threats were efficient since the U.S. had the power to block the sale of reactors ordered from Westinghouse and persuaded Canada to suspend negotiations for a similar sale.
79-3 Arab League vs Canada 1979	Deter planned move of embassy in Israel from Tel Aviv to Jerusalem 2	Reduction of imports	Plans to move the embassy were officially cancelled in October 1979. Sanctions adopted were light, but the Arab League had an important leverage. Moreoever, the issue could be considered as trivial.
87-3 United States vs El Salvador 1987–88	Reverse amnesty decision 2	Threat to reduce economic aid	President Duarte denies amnesty to rebels in April 1988. Even if sanctions were soft, the political objective (and thus also the cost of compliance) was really modest.
89-1 India vs Nepal 1989–90	Reduce ties with China 3	Blockade and abrogation of treaties	Although vague, the agreement reached in 1990 has addressed India's concerns about a possible tilt toward China. India has been able to virtually blockade Nepal. The massive sanctions gave Nepal little choice but to comply with India's demands. They led to the choice of Bhattarai as Prime Minister. His stated priority was to improve relations with India.

Cases that we consider as successes, while Pape considers them as failures or as inconclusive cases (9)

Case	Objective Ambition /4	Main sanctions	Comments / explanation
48-1 United States vs Netherlands 1948–49	Recognize Republic of Indonesia 3	Reduction of aid	The objective has been achieved (the Unitary Republic of Indonesia has been proclaimed) and sanctions were essential in the process as the Netherlands were hihgly dependant on US aid after the War.
56-3 United States vs United Kingdom 1956	Withdraw troops from Suez 4	Restrictions on access to dollar credits to pay for oil imports	Troops withdrew from Suez and sanctions adopted were severe. Indeed, the U.S. refused to permit U.K. access to dollar credits to pay for oil imports and blocked British access to IMF loans to stabilize the pound. Pape argues that the U.K retreated from Soviet nuclear threats. However, those threats did not appear very credible: Khrushchev later admitted in his memoirs that he was not seriously "thinking of going to war" as he lacked the necessary ICBMs to make good his threats (D. Neff in *Warriors at Suez*).
65-2 United States vs India 1965–67	Alter policy to favor agriculture 2	Reduction of food aid	The thrust of the reform adopted in 1966 was that India could strengthen its own economy and emerge as a market for American agricultural products such as hybrid seeds, pesticides, and fertilizers (K. Ahlberg in *"Machiavelli with a Heart": The Johnson Administration's Food for Peace Program in India, 1965–1966)* . There is no convincing evidence to support Pape's argument that the reform had already been decided before US sanctions. There was an ongoing debate over according primacy to industrialization or agricultural production. Even if the objective was modest, sanctions helped achieve it.
65-3 United Nations, United Kingdom vs Rhodesia 1965–79	Majority rule by black Africans 3	Trade embargo	Majority rule has been adopted in 1979. Guerilla war was an essential factor in the downfall of white minority rule and sanctions reduced the regime's ability to carry on the war (Minter and Schmidt in *When Sanctions Worked: The Case of Rhodesia Reexamined).*
76-2 United States vs Taiwan 1976–77	Forgo nuclear reprocessing 3	Delays in fuel shipment	The U.S. goal was to prevent Taiwan from reprocessing spent nuclear fuel into plutonium. Hot-cell facility was shut down in 1977. Sanctions were decisive since the U.S. were practically Taiwan's only source of reactors and enriched uranium fuel (according to Assistant Secretary of State Arthur Hummel, Jr). There is no evidence that Taiwan had secretly continued reprocessing and had accumulated enough plutonium for ten nuclear bombs, as claimed by Pape. However, it is true that Taiwan had accumulated enough spent fuel from its operation of the legal research reactor for ten bombs if the plutonium could be extracted. But once more, there is no available evidence that Taiwan was able to reprocess spent fuel after the hot-cell facility was shut down.
77-4 Canada vs Japan 1977–78	Strengthen nuclear safeguards 2	Suspension of uranium shipments	Canada and Japan ratify bilateral safeguards agreement in 1980. It does not matter if Japan had already used Canadian uranium for weapons or not, transfered it to third countries or not. What matters to determine the success is not the proof of a change of Japanase behavior (as claimed by Pape) but the obtention of additional safeguards by Canada. Canada obtained a formal, binding agreement incorporating stringent safeguards. Thus, the objective has been achieved.
79-1 United States vs Iran 1979–81	1) Release hostages 2) Settle expropriation claims 1	Iranian imports embargo, asset freezing	Hostages have been released, but the U.S. made important concessions (freeze the shah's assets and prohibit U.S. firms from making claims against Iran). However, at the end of the day, the outcome was positive and the massive sanctions were determinant in the bargaining process.

Case				Objective Ambition /4	Main sanctions	Comments / explanation
82-2	Netherlands	vs	Suriname	1) Improve human rights 2) Limit alliance with Cuba and Libya 3) Reverse coup	Reduction of economic aid	The political objectives have been attained but military coercion (Dutch military, Dutch-supported guerrilla and threat of a U.S. intervention) has been used with economic pressure. However, due to the lack of evidence that military pressure has been decisive in the achievement of the objective, the success is confirmed.
	1982–91			4		
82-3	South Africa	vs	Lesotho	1) Return refugees suspected of anti-state activities 2) Destabilize Chief Jonathan	Blockade	South Africa used both military pressure and economic sanctions to achieve the objective. However the power imbalance between the two countries was so great that the blockade alone would have been sufficient to achieve the objective.
	1982–86			2		

Cases not reviewed by Pape that we consider as successes (17)

75-5	United States	vs	Chile	1) Improve human rights and resolve Letelier case	Reduction of economic aid, tariffs, reduction of military aid	Letelier family has been compensated and culprits have been sentenced. Many historians highlight the role played by the U.S. However, it is hard to separate the effects of the economic sanctions from those of diplomatic pressure to determine the causality. All the same, due to the lack of evidence that sanctions have not been decisive in the achievement of the objective, the success is confirmed.
	1975–90			2		
78-8	United States	vs	Libya	3) Stop pursuit of chemical, nuclear weapons	Embargo (mainly oil)	WMDs have been dismantled. Two factors could have caused it: sanctions or military threats. The timing of events is suspicious: the agreement was reached long after the beginning of the U.S. embargo on crude oil imports (1982) and only six days after the capture of S. Hussein. Even if many Bush administration officials have emphasized the U.S.-led 2003 invasion of Iraq as a key factor in Tripoli's decision, years of sanctions and diplomacy were more important (K. Davenport in *Chronology of Libya's Disarmament and Relations with the United States*). The military threat did not appear very credible since Libya's modest chemical weapons arsenal and infant nuclear program were not an imminent threat that would have justified an unpopular military intervention.
	1978–2004			3		
85-1	U.S., British Commonwealth	vs	South Africa	End apartheid	Oil delivery, restriction on trade with the US	The first elections with universal suffrage were organized in 1994. The ad hoc sanctions imposed by the U.S., E.C., and Commonwealth countries were more important than the ongoing U.N. sanctions, the impact of which declined over time as a result of adaptive measures adopted by the South African government. However, it appears that sanctions were determinant and largely constructive in ending apartheid (*How Sanctions Work: Lessons from South Africa* by N.C. Crawford, A. Klotz). Among the channels, we find : the embargo on arms (though far from comprehensive) hurt the country's war-making capability, the decline in investor confidence resulted in pressure for compromise by leading white business figures.
	1985–91			3		
86-4	France	vs	New Zealand	Repatriation of French agents	Restriction on the volume of European Community agricultural imports (solved before implementation), French customs delaying tactics	In 1988, both French agents were back to France. Sanctions were essential for achieving the modest objective since France had a considerable leverage through the European Economic Community (it could sharply cut the quotas for imports of farm products from New Zealand).
	1986			1		
90-1	United States, United Nations	vs	Iraq	1) Renounce weapons of mass destruction	Period 1990-1991: embargo on oil imports	The removal of WMDs was the official and overarching goal of the U.N.S.C. (G. Lopez and D. Cortright in *Containing Iraq: sanctions worked*). Thus the absence of weapons of mass destruction revealed after the U.S.-led intervention in 2003 can be viewed as the proof that sanctions were ultimately successful. The large scale sanctions on oil were decisive in the process.
	1991–2003			3		
90-2	United States	vs	El Salvador	1) Improve human rights 2) End civil war	Reduction of military aid	The objective has been achieved: package of constitutional reforms approved, sentences for some officers implicated in human rights abuses, end of civil war,… The target government did not have the resources to conduct the war without US assistance so reductions in aid carried considerable leverage. Thus, sanctions were successful (M. W. Doyle & N. Sambanis in *Making War and Building Peace*)
	1990–93			4		
91-4	United States, Netherlands	vs	Indonesia	Independance for East Timor	Reduction of economic aid	Indonesia accepted the results of the August referendum proclaiming independance for East Timor. Two factors could have caused it: sanctions or the military intervention. However, the swing of Indonesia is due to the U.N. economic pressure and not to the use of force (R. Goy in *L'indépendance du Timor oriental)* . The U.N.S.C. did not want to intervene militarily without the support of the Indonesian government and the economic pressure made the Indonesian President accept the international peace keeping force intervention.
	1999-2002			3		
91-7	U.S.SR/Russia	vs	Turkmenistan	Increase rights of Russian minority	Embargo on gas imports	The objective has been achieved (dual citizenship to ethnic Russians, joint venture between the two countries to exploit the natural gas reserves). Sanctions were massive (costing 20% of the GNP per year) while the cost of compliance was not very high for Turkmenistan (D. Drezner in *The Sanctions Paradox*).
	1991–95			2		
92-3	U.S., U.K.	vs	Malawi	1) Establish democracy 2) Improve human rights		The outcome was positive as the opposition won the first multipary elections and political detainees have

Case			Objective Ambition /4	Main sanctions	Comments / explanation
	1992–93		3	Reduction of economic aid	been released. Economic sanctions were essential for achieving the obejctive, because of three factors: 1) aid dependency, 2) donor coordination and 3) a strong and persistent domestic opposition (N. G. Emmanuel in *Democratization in Malawi: Responding to International and Domestic Pressures*)
92-10	China 1992–94	vs France	Cancel arms sales to Taiwan 2	Major barrier to Chinese market access	"On January 12, 1994 the French government committed itself to stop in the future authorizing French companies' participation in the armament of Taiwan" (J.P. Cabestan in *France's Taiwan Policy: a case of shopkeeper diplomacy*). Sanctions were decisive in achieving the outcome since Chinese leverage was important.
92-11	U.S. 1992–95	vs Nicaragua	1) Strengthen civil control over military 2) Settle expropriation claims 2	Reduction of economic aid	The outcome was positive since the military code has been reformed, strengthening civilian control of the military and the elections were judged free, fair and peaceful by international observers. Sanctions put a significant pressure on an already fragile economy, leading to the policy change.
92-12	United Nations 1992–2003	vs Libya	Extradite Pan Am suspects 1	Sector-specific imports embargo: -petroleum refining, loading equipment-, arms embargo, air ban-increased travel and transportation costs-	The goal has been achieved with the acceptance of responsibility for the bombing and the compensation of victims a few weeks before the invasion of Iraq. However it is neccessary to identify the factor that determined the outcome: economic sanctions or military threat. As in the case 78-8, targeted sanctions were more decisive in achieving the outcome than a spillover effect from the U.S. invasion of Iraq. It does not appear likely that Libya would have been invaded to simply obtain the extradition of the suspects.
93-2	U.S., European Union 1993	vs Guatemala	Reverse coup 4	Reduction of economic aid	The coup has been reversed in less than 14 days. Leaders miscalculated the degree of international and domestic opposition to the coup. When the Defense Minister began to back away publicly from Mr. Serrano, he cited the need to keep the situation "from converting itself into a social explosion the consequences of which we can have no idea" and international pressure. Without having actual evidences proving that another factor was more decisive than economic sanctions, the case is categorized as a success.
93-7	U.S.S.R./ Russia 1993–96	vs Kazakhstan	1) Secure nuclear weapons and military basing rights 2) Autonomy for ethnic Russians 3) Rights regarding Kazakh energy resources 2	Embargo on oil imports	Russia obtained significant concessions with respect to each of its objectives thanks to economic sanctions (D. Drezner in *The Sanctions Paradox*). Indeed, Russia had a considerable leverage since it controlled every transit option and had a hand in every major energy project in Kazakhstan.
94-2	Greece 1994–95	vs Albania	Release jailed ethnic Greek leaders 1	Reduction of economic aid, citizens expelled -loss of worker remittances-	The five members of Omania accused of killing two Albanian soldiers have been released in 1995. While the objective was modest, sanctions were severe and took profit of Albania's economic dependence on Greece.
95-2	European Union 1995	vs Turkey	Improve human rights 2	Delay in implementing the custom union (never applied)	The Turkish government has taken some limited steps to improve human rights situation (amendment of part of the antiterrorism law, retrial of Kurdish members of the Turkish Parliament). Therefore even if only minor progress has been made, it was due to sanctions as the European Community had a strong leverage.
98-3	Turkey 1998–99	vs Italy	Extradite leader of the Kurdish Workers' Party (PKK) 1	Threat to put some restrictions on proposals by Italian companies to bid on defense projects	Even if Italy did not extradite Ocalan, we can consider that the objective has been achieved thanks to Italy. Italian Prime Minister D'Alema had suggested that Ocalan would probably not be granted asylum in Italy and might be tried for terrorism offenses if he remained. Thus Ocalan had to leave the country, leading him to be seized in Nairobi, Kenya and flown to Turkey in a Turkish undercover operation.

Cases that we consider as failures, agreeing with Pape (20)

FORCE (16)					
14-1	U.K. 1914–18	vs Germany	Military victory 4	Blockade	The World War I case was determined by military force.
21-1	League of Nations 1921	vs Yugoslavia	Block Yugoslav attempts to wrest territory from Albania; retain 1913 borders 4	Threats to prevent all financial, commercial or personal intercourse between the nationals of the covenant-breaking State and the nationals of any other State (Art 16 of League Of Nations Covenant)	The objective has been reached, but it appears highly likely that Yugoslavia retreated from Italian military threat and not from the economic threats. The Article 16 of the League of Nations Covenant opened the way for military intervention and the United Kingdom, Italia and Japan gave Italia blank check to reverse the Yugoslav incursions. Thus, military threat was more credible than economic threat.
25-1	League of Nations 1925	vs Greece	Withdraw from occupation of Bulgarian border territory 4	Threats to prevent all financial, commercial or personal intercourse between the nationals of the covenant-breaking State and the nationals of any other State (Art 16 of League Of Nations Covenant)	Greek troops withdrew to frontiers. However the outcome was not due to the threats of sanctions. Those did not appear credible since sanctions were rejected by the League in favor of a naval demonstration. Moreover Greece discovered that it had not actually been invaded. Thus, either it was diplomacy that solved the dispute, or it was the military threat that solved it.

Case	Objective Ambition /4	Main sanctions	Comments / explanation
39-1 Alliance powers, U. S. vs Germany 1939–45	Military victory 4	Blockade	The objective has been achieved since Germany lost the war. However we cannot claim it was due to economic sanctions. Germany has been conquered and never surrendered. Moreover, blockade is a normal weapon of war. Thus this case has been determined by military force.
39-1 Alliance powers, U. S. vs Japan 1939–45	Military victory 4	Blockade	This case cannot be considered as a success of economic sanctions, even if Japan lost the war. The outcome was due to military force: "Japan, at the brink of total defeat, surrendered under the twin threats of invasion of the home islands and atomic bombardment." (Pape).
51-1 U.S., U.K. vs Iran 1951–53	1) Reverse the nationalization of oil facilities 2) Destabilize Mussadiq government 4	Embargo on oil imports	Both objectives have been attained since Mussadiq was overthrown and sender countries obtained a stake in the new company formed to exploit Iranian fields. However the case has been solved by a foreign-sponsored military coup (staged by the CIA). Moreover, there is no evidence that the oil embargo played any role.
56-4 United States vs Laos 1956–62	1) Destabilize Prince Souvanna Phouma government 2) Destabilize General Phoumi government 3) Prevent communist takeover 4	Reduction of economic aid and reduction of military aid	The case is both partially unsuccessful and due to military coercion. It is unsuccessful since the United States eventually accepted exactly what it initially aimed at preventing (a coalition headed by Souvanna that included the communist Pathet Lao). Moreover, every step towards the U.S. objective was due to CIA coups and to the strong links between the United States and the noncommunist factions in Laos.
60-1 United States vs Dominican Republic 1960–62	1) Cease subversion in Venezuela 2) Destabilize Trujillo government 4	Embargo on sugar imports	The objectives were met after a coup that killed Trujillo. Then his relatives went into exile. The coup was a U.S.-sponsored assassination, followed by successful military coercion. Sanctions played no significant role, even as a signal of the U.S. opposition to Trujillo since the Trujillos were forced out by a U.S. invasion threat, backed by a naval task force and jet fighters that buzzed the city.
62-1 United States vs Brazil 1962–64	1) Settle expropriation claims 2) Destabilize Goulart government 4	Reduction of economic aid and restriction on loans	The case has been solved by a coup, and sanctions have not been determinant since : 1) Bad economic situation was not due to sanctions, 2) Coup plotters were not motivated by the condition of the economy, 3) Economic sanctions were not needed to signal U.S.'s support to the coup since the United States explicitly communicated it to the plotters.
63-4 United States vs South Vietnam 1963	1) Ease repression 2) Remove Nhu 3) Destabilize Diem 4	Reduction of economic aid	This is a case of foreign-sponsored coup and sanctions were not determinant since: 1) Economic harm done by sanctions was negligible and played little part in motivating the coup plotters, 2) Economic sanctions were not needed to signal U.S.'s support to the coup since the United States explicitly communicated it to the plotters.
67-1 Nigeria vs Biafra 1967–70	End civil war 4	Blockade, loss of monetary reserves from change in new Nigerian currency	The war ended in Januray 1970, but sanctions did no play the key role in the process. The blockade has lasted for three years and its contribution was not decisive since it did not undermine the Biafrans' morale. They continued to fight until a breakthrough by more than 180,000 Nigerian troops on Christmas Eve 1969 (the capital Umuahia fell to Nigerian troops) succeeded in cutting Biafra in half, rendering further resistance infeasible. Thus a regular military intervention was decisive in determining the outcome.
70-1 United States vs Chile 1970–73	1) Settle expropriations claims 2) Destabilize Allende government 4	Restrictions on multilateral loans -World Bank, InterAmerican Development Bank-, trucker's strike financed by CIA	The objectives have been met after a coup. Sanctions did not play a significant role in the military coup that killed Allende. Plotters were not motivated by the economic harm done by sanctions. Moreover, sanctions were not needed to signal U.S.'s support to the coup since the CIA already armed, funded and encouraged coups against Allende in 1970. Moreover even if the CIA "did not instigate the coup that ended Allende's government on 11 September 1973", it condoned it (according to www.cia.gov).
72-1 U.S., U.K. vs Uganda 1972–79	1) Retaliation for expelling Asians 2) Improve human rights 3) Destabilize Amin government 4	Restrictions on trade	The outcome is only partially positive. The retaliation objective was achieved as soon as sanctions were implemented. The destabilization objective was achieved when Amin fled to Libya in 1979. However the objective related to human rights cannot be considered as reached. Furthermore, the partially positive outcome was not due to sanctions, but to Tanzanian military pressure (T. Avirgan and M. Honey in *War in Uganda: The Legacy of Idi Amin*). From 1977 onwards, Amin began killing his closest associates, creating a split in the army between a faction loyal to Amin and one loyal to Vice President Adrisi. To reunite his army, Amin invaded Tanzania in 1978. However a Tanzanian counterattack swept him from power while his own troops consistently refused to fight.
77-5 United States vs Nicaragua 1977–79	1) Destabilize Somoza government 2) Improve human rights 4	Restrictions on multilateral loans IMF, reduction of economic aid, reduction of military aid	The case has been solved when Sandinistas overthrew Somoza. Economic sanctions played little role in the coup, for 3 reasons: 1) They were not enforced (the IMF approved a loan in June). 2) They were not instrumental in encouraging the rebels to initiate their final successful offensive. The general strike, the national insurrection, the anti-regime mass mobilizations, and the violent National Guard response were more powerful (*Washington, Somoza and the Sandinistas* by M. H. Morley) 3) U.S. influence went through military, not economic, pressure.

Case				Objective Ambition /4	Main sanctions	Comments / explanation
81-2	United States	vs	Poland	1) Lift martial law 2) Free dissidents 3) Resume talks with Solidarity	Reductions on trade, on US ExImbank loans	The outcome is only partially positive. Only trivial concessions were made (martial law lifted, Solidarity opponents freed,...). Poland agreed to none of the main concessions, such as freedom of association, and speech (stated as an objective by Reagan in his Christmas address), or freedom of activity for released prisoners. However, if we consider the objectives stated by HSE, we can consider that they have been achieved. The causality is also dubious. Soviet influence was considerable through diplomacy and military threats. Poland was under constant threat of invasion by its Warsaw Pact allies due to the persistence of Solidarity. Thus, Jarulzelski freed Walesa when he felt sufficiently secured (by the end of 1982) and when Solidarity was not seen as an immediate threat anymore. When Poland did actually democratize, after the end of the sanction episode, it did so as a result of Gorbachev's repeal of the Brezhnev Doctrine in July 1988 and a negotiated agreement between the Polish and Soviet governments in April 1989 to legalize Solidarity and hold new elections.
	1981–87			2		
82-1	United Kingdom	vs	Argentina	Withdraw troops from Falklands Islands	Embargo	Argentina was simply defeated militarily during the war and economic sanctions had little effect on the outcome. The embargo has been implemented after the beginning of the war and has been used as a weapon among others.
	1982			4		
OBJECTIVE NOT ATTAINED (4)						
56-2	U.S., U.K., France	vs	Egypt	1) Ensure free passage through Suez canal 2) Compensate for nationalization	Asset freezing, withholding of payments - reduction in operating revenues from Suez Canal -	The objective has not been met since Nasser refused significant international administration of the canal. He also refused to give up some control over tolls.
	1956			2		
63-1	United States	vs	United Arab Republic	Cease military activity in Yemen and Congo	Restrictions on multilateral loans US développement, food aid	Egypt did not withdraw troops from Yemen until after its defeat by Israel in the 1967 Six-Day War. As a result of the war, Nasser recalled 15,000 of his troops from Yemen. Moreover, anti-U.S. rhetoric in the Egyptian press increased over time.
	1963–65			4		
73-1	Arab League	vs	United States	1) Retaliation for support for Israel in October war 2) Restore pre-1967 Israeli borders	Suspension of oil shipments	There is no serious hint that the two target countries altered their position. They refused to change what the Arabs saw as a pro-Israeli stance. Apart from the primary objectives related to Israel, there existed an economic objective: obtain higher prices for oil. However considering the latter objective would imply a categorization as a trade dispute.
	1973–74			3		
73-1	Arab League	vs	Netherlands	1) Retaliation for support for Israel in October war 2) Restore pre-1967 Israeli borders	Suspension of oil shipments	*cf* first part of the case
	1973–74			3		

Cases not reviewed by Pape that we consider as failures (15)

FORCE (4)						
91-1	U. N., U.S., European Community	vs	Yugoslavia	End civil war in Bosnia, Croatia	Trade embargo	The war ended with the Dayton Peace Agreement in 1995. Economic sanctions made Milosevic more cooperative, but were not decisive in the end of the Bosnian war (M.D. Djilas in *International Problems* (Yugoslavia) 1996). It was N.A.T.O.'s resolve to use force against those opposing peace that was determinant.
	1991–2001			4		
92-1	Economic Community of West African States, U.N.	vs	Liberia	End civil war	Restrictions on imports from rebel areas	The objective has been achieved with the disarmament in January 1997, followed by elections in July, which were won by Charles Taylor. What brought peace was not economic sanctions but military force. When the rather ineffective UN embargo on arms sales to Liberia was decided in 1992, Taylor already had substantial arms and ammunition stockpiles. The ECOMOG played a key role when it abandonned its peace-keeping mandate for a direct combat role. Diplomacy was also decisive in bringing peace since Abacha (Nigerian leader) persuaded Taylor to agree to the ceasefire and to participate in the election.
	1992–98			4		
93-1	U.S., United Nations	vs	North Korea	Renounce nuclear weapons	U.S.S.R. threatens to cut off nuclear supplies and cooperation. The US circulates a draft U.N.S.C. resolution to end cooperation, economic assistance from UN agencies and impose a ban on arms trade. The second phase would ban financial transactions.	The outcome was not really positive since North Korea did not actually renounce nuclear weapons. In 1995, North Korea was probably already working on a covert nuclear weapons program (T. Hubbard, U.S. ambassador in South Korea). Thus the positive outcome was at best temporary. Moreover the progress made was mostly due to military threat, which was greater than economic threat. As a matter of fact the U.S. prepared to bolster its troops on the peninsula in 1994. Bill Clinton also instructed the Department of Defense to plan for an invasion of North Korea (*Encyclopaedia Britannica*).
	1993–94,			3		
93-3	United Nations	vs	Angola, U.N.ITA	1) End civil war 2) Promote democracy	Embargo on diamonds exports, restrictions on oil and arms deliveries	The objective was achieved with the end of the civil war in August 2002. However, the case was determined by military force since it was the killing of Jonas Savimbi that was the key to the peace process (P.J. Gomes in *Situation Report: Angola*). Economic sanctions were not crucial in achieving the military result.
	1993–2002			4		
INTERNAL FACTORS & DIPLOMACY (6)						

Case	Objective Ambition /4	Main sanctions	Comments / explanation
77-2 United States vs Guatemala 1977–2005	Improve human rights 2	Reduction of multilateral loans, reduction of military aid, reduction of economic aid	The case is both partially unsuccessful and due to internal factors. It is unsuccessful since in 2005 the State Department published a report about human rights claiming that "Corruption and substantial inadequacies in the police and judicial sectors, widespread societal violence, and impunity for criminal activity continued". Moreover internal factors and diplomacy pressure were more decisive than economic sanctions in achieving the modest progress on human rights issues. Indeed, sanctions have lasted for almost thirty years and were mostly symbolic.
96-2 U.S., European Union vs Niger 1996–2000	Restore democracy 3	Reduction of economic aid	The case has been solved by a countercoup led by Wanke. He allowed a transition back to civilian rule and new elections were held as announced. The opposition won, marking the end of the autocratic regime (D. Aksoy, D.B. Carter, J. Wright in *Terrorism and the Fate of Dictator)* . There is no evidence that sanctions were actually decisive in the democratization process since observers do not seem to doubt that Wanke really wanted to hold free elections and restore democracy.
96-5 U.S., Mercosur vs Paraguay 1996	Deter coup attempt 4	Threat of economic sanctions from Brasil, Argentina, Uruguay (in particular: exclusion from MERCOSUR)	The outcome has been achieved when Ovieda agreed to step down. Nevertheless, this decision was not due to economic sanctions. Sanctions were mostly symbolic since they were used to back up rhetoric (according to Hakim, president of the Inter-American Dialogue). Furthermore, Paraguayan people resisted and two days were enough to make Oviedo give up. Therefore it is more credible to think that the combination of diplomatic pressure and of internal opposition was more decisive than the threat of economic sanctions.
98-2 U.S., European Union vs Yugoslavia, Serbia 1998–2001	2) Destabilize Milosevic 4	Restriction on investments, asset freezing	What solved the case was Milosevic's resignation in 2000. The timing of events is important to undestand what determined the outcome. N.A.T.O. launched airstrikes against Yougoslavia in 1999. On 5 October 2000, following days of nation-wide strikes, thousands of opposition supporters marched into Belgrade. Security forces did not intervene and sometimes joined the protesters. The day after, Milosevic resigned and conceded that opposition leader Kostunica had won the presidential elections. The move came right after a visit to Belgrade by Russian Foreign Minister Ivanov informing Milosevic that Russia would no longer support him. Thus sanctions might have had an impact on voters but then it is mostly internal factors (Kostunica's call for protests) and the loss of Russian support that were decisive.
00-1 United States vs Ecuador 2000	Prevent coup attempt 4	U.S. officials threaten to reconsider support for IMF loans and to cut aid and discourage foreign investment. O.A.S. General secretary threatens political isolation and economic sanctions.	The outcome was positive since Mendoza dissolved the junta and resigned from the army. However, the positive outcome was due to diplomatic pressure. Mendoza did not expect such a strong opposition from the United States, that is why he dissolved the junta the day after the coup. The diplomatic responses of the U.S.A. and the O.A.S. were particularly important in convincing Ecuador's Military High Command to restore the constitutional order (Barracca in Military Coups in *the Post-Cold War Era: Pakistan, Ecuador and Venezuela*) but sanction threats were not decisive.
OBJECTIVE NOT ATTAINED (5)			
77-4 Canada vs Japan 1977–78	Strengthen nuclear safeguards 2	Suspension of uranium shipments	The main objective was related to France (not NPT signatory) since Canada wanted assurances that supplied fuel would not be used in France's military nuclear program, and that France would accept safeguards on civilian power program. Since France refused the agreement, the objective cannot be considered as attained.
78-8 United States vs Libya 1978–2004	Destabilize Gadhafi 4	Restrictions on oil imports	Even if sanctions induced changes in the regime policies, it is a failure if we stick to the stated objective.
90-6 U.S., Saudi Arabia vs Yemen 1990–97	Enforce U.N. embargo vs. Iraq 2	Reduction of economic aid	The political objective appears unclear in this case. It seems that it was more about punishment or retaliation. If the objective was a change of attitude towards the senders, the case was also a failure since the relation between the senders and Yemen had not improved with the implementation of the sanctions. "Yemeni leaders were not ready to pay the necessary price to achieve this aim, i.e. to relinquish relations with Iraq and admit that Yemeni policy in the Gulf was a mistake" (J. Kostiner in *Yemen: The Tortuous Quest for Unity, 1990–1994*)
91-8 United States vs Peru 1991–95	1) Improve human rights 2) Promote democracy 3	Reduction of economic aid	The case was an autocoup, but Fujimori remained in power. Actually, he made no concession to promote democracy or human rights. While sanctions were being lifted in 1995: 1) There were reports of massive electoral fraud in the 1995 election won by Fujimori but endorsed by the O.A.S. and the U.S., 2) The Peruvian Congress passed a law granting amnesty to human rights violators, thereby giving pardons to those involved in the La Cantuta massacre, 3) Amending the 1993 Constitution, the Peruvian Congress passed a law that allowed President Fujimori to run for re-election in 2000.
94-1 Greece vs Macedonia 1994–95	Change name of nation 2	Blockade	The sender of the sanctions does not consider that the objective has yet been achieved. According to the Greek Ministry of Foreign Affairs, the Former Yugoslav Republic of Macedonia has systematically violated the Accord, as well as the obligations deriving from it: by using the name "Republic of Macedonia" in international organizations – including the U.N. –, by using symbols the use of which is prohibited under article 7.2 of the Interim Accord, ... no substantial progress has been made in the 19 years of negotiations under the auspices of the United Nations.

Case	Objective Ambition /4	Main sanctions	Comments / explanation
Cases considered as trade disputes (9)			
SUCCESSES (5)			
38-1 U.S., U.K. vs Mexico 1938–47	Settle expropriation claims 1	Embargo on oil imports, restriction on ExImbank loans	We can either consider the case as a trade dispute or as a dispute involving economic independence. In the latter, sanctions failed. As a trade dispute however, it can be considered as a success since the compensation was fair.
58-1 U.S.S.R. vs Finland 1958–59	Adopt pro-U.S.S.R. policies 1	Embargo on imports	The issue is the following: in 1958, Finnish imports from U.S.S.R. declined (autos, in particular) as Finland enlarged trade with Western Europe. Political objectives were not important since once the economic policy assurances were provided, the Soviets dropped the demanded communist participation in the Finnish government. Therefore the case is a trade dispute and a success since the objective is met.
61-1 U.S. vs Ceylon 1961–65	Settle expropriation claims 1	Restriction on multilateral loans (World Bank), reduction of economic aid	Even if nationalization can be a highly politically charged act, this case is a trade dispute since Ceylon's right of expropriation was not overturned. It is also successful since the compensation was fair.
65-1 U.S. vs Chile 1965–66	Roll back copper price increase 1	Threat to reduce copper imports, to suspend aid and promise to remove tariff on copper.	The case was a trade dispute since the U.S. only tried to keep buying copper at a lower price. It is also a success since the price increase has been cancelled. However, the agreement has only lasted for 7 months.
68-1 U.S. vs Peru 1968	Forgo aircraft purchases from France 1	Reduction of economic aid	Once more, this case is an economic sanction to obtain compensation after an expropriation. Thus it is a trade dispute. It is also a success since the compensation was fair.

Source: Author, based on HSE, 2007, Economic sanctions reconsidered, 3rd ed

IX. Appendix B: Details of the sanction implemented

APPENDIX B: Details of the Types of Sanctions Implemented

Restrictions targeting mainly		Case no.	Principal sender	Target country	Active years	Goals of sender country	Main sanction: annual cost in current dollars	Success	Trade Dispute	Threat
The imports of the Target country	Supply of raw material or nuclear technologies, linked to the non-proliferation objective	74-2	Canada	India	1974–76	1) Deter further nuclear explosions 2) Apply stricter nuclear safeguards	suspension of nuclear cooperation with India : knowledge, delays in completion of reactors: 27, transfers:4	0	0	0
		74-3	Canada	Pakistan	1974–76	1) Apply stricter safeguards to nuclear power plants 2) Forgo nuclear reprocessing	suspension of fuel and spare parts delivery: 11, cancellation of shipment of fuel fabrication plant :2	0	0	0
		75-1	United States, (	South Korea	1975–76	Forgo nuclear reprocessing	US threatens to block South Korea's purchase of reactors for peaceful purposes	1	0	1
		75-3	United States	South Africa	1975–82	1) Adhere to nuclear safeguards 2) Avert explosion of nuclear device	halt in nuclear fuel (HEU: Highly Enriched Uranium) shipment: 2	0	0	0
		76-2	United States	Taiwan	1976–77	Forgo nuclear reprocessing	delays in fuel shipment:16	1	0	0
		77-4	Canada	Japan	1977–78	Strengthen nuclear safeguards	suspension of uranium shipments: 75	1	0	0
		77-4	Canada	European Com	1977–78	Strengthen nuclear safeguards	suspension of uranium shipments: 40	0	0	0
		78-2	United States	Brazil	1978–81	Adhere to nuclear safeguards	suspension of uranium shipments: 5	0	0	0
		78-3	United States	Argentina	1978–82	Adhere to nuclear safeguards	suspension of fuel shipment: 0.2	0	0	0
		78-4	United States	India	1978–82	Adhere to nuclear safeguards	suspension of fuel shipment: 12	0	0	0
		83-1	Australia	France	1983–86	Stop nuclear testing in South Pacific	suspension of uranium shipments: negligible	0	0	0
		93-1	United States, l	North Korea	1993–94,	Renounce nuclear weapons	the Soviet Union threatens to cut off nuclear supplies and cooperation. The US circulates a draft U.N.S.C. resolution to end cooperation; economic assistance from UN agencies, and impose a ban on arms trade. The second phase would ban financial transactions, including remittances from Japan.	0	0	1
	Partial embargo on supplies to the target country	17-1	United States	Japan	1917–18	1) Contain Japanese influence in Asia 2) Persuade Japan to divert shipping to the Atlantic	steel and iron delivery: 23	0	1	0
		32-1	League of Natic	Paraguay	1932–35	Settle the Chaco War	sale of arms and foodstuff: negligible	0	0	0
		32-1	League of Natic	Bolivia	1932–35	Settle the Chaco War	sale of arms and foodstuff: 2.4	0	0	0
		40-1	United States	Japan	1940–41	Withdraw from Southeast Asia	reduction of shipments of crude oil and products:60, iron and steel scrap: 11	0	0	0
		48-3	USSR	France	1948–49	1) Prevent formation of a West German government 2) Assimilate West Berlin into East Germany	cost of airlift of supplies: negligible	0	0	0
		48-3	USSR	United Kingdom	1948–49	1) Prevent formation of a West German government 2) Assimilate West Berlin into East Germany	cost of airlift of supplies: 26	0	0	0
		48-3	USSR	United States	1948–49	1) Prevent formation of a West German government 2) Assimilate West Berlin into East Germany	cost of airlift of supplies: 227	0	0	0
		62-2	United Nations	South Africa	1962–94	1) End apartheid 2) Grant independence to Namibia	oil delivery: 250	0	0	0
		63-5	United Nations,	Portugal	1963–74	Free African colonies	oil delivery: 11	0	0	0
		73-1	Arab League	United States	1973–74	1) Retaliation for support for Israel in October war 2) Restore pre-1967 Israeli borders	oil delivery: 3217	0	0	0
		73-1	Arab League	Netherlands	1973–74	1) Retaliation for support for Israel in October war 2) Restore pre-1967 Israeli borders	oil delivery: 2681	0	0	0

Restrictions targeting mainly		Case no.	Principal sender	Target country	Active years	Goals of sender country	Main sanction: annual cost in current dollars	Success	Trade Dispute	Threat
		78-5	United States	USSR	1978–80	Liberalize treatment of dissidents-e.g., Shcharansky	increased cost of imports of oil, gas field technology, equipment: 51	0	0	0
		80-1	United States	USSR	1980–81	1) Withdraw Soviet troops from Afghanistan	suspension of grain and phosphate delivery: 301	0	0	0
		80-1	United States	USSR	1980–81	2) Impair Soviet military potential	suspension of grain and phosphate delivery: 302	0	0	0
		80-2	United States	Iraq	1980–2003	1) Terminate support of international terrorism 2) Renounce weapons of mass destruction	suspension of exports of engine cores, commercial jets: 22	0	0	0
		81-3	United States	USSR	1981–82	1) Lift martial law in Poland 2) Cancel USSR-Europe pipeline project 3) Impair Soviet economic and military potential	increased cost of imports of oil, gas field technology, equipment: 380	0	0	0
		90-5	USSR	Lithuania	1990	Revoke independence declaration	reduction in exports of energy, food and industrial inputs: 124	0	0	0
		91-2	United States	China	1991–	Stop weapons proliferation	sales of high technology products -satellites-:100 over 6 years	0	0	0
		92-12	United Nations	Libya	1992–2003	Extradite Pan Am suspects	sector-specific imports embargo: -petroleum refining, loading equipment-:115, arms embargo:70, air ban-increased travel and transportation costs-:90	1	0	0
		93-1	United States, U	North Korea	2002–	Renounce nuclear weapons	restrictions on oil delivery : 68 over 4 years, food aid: 59.2	0	0	0
		93-6	USSR/Russia	Ukraine	1993–97	1) Recognize Russian control over Black Sea fleet 2) Relinquish nuclear weapons	restrictions on oil and gas deliveries: 1020	0	0	0
Military aid or arms supply		48-5	United States, C	USSR, Comecc	1948–94	1) Deny strategic materials 2) Impair Soviet bloc military potential	delivery of high technology and dual use goods: 753	0	0	0
		56-1	United States	Israel	1956–83 (Interr	1) Withdraw from Sinai 2) Implement UN Resolution 242 3) Push Palestinian autonomy talks	reduction of military aid and reduction of economic aid: 16, with a higher amount of military aid reduction	0	0	0
		71-1	United States	India, Pakistan	1971	Cease fighting in East Pakistan (Banglade	reduction of military aid to Pakistan: 32	0	0	0
		73-2	United States	South Korea	1973–77	Improve human rights	reduction of military aid: 236, reduction of economic aid: 97	0	0	0
		74-1	United States	Turkey	1974–78	Withdraw Turkish troops from Cyprus	reduction of military aid: 69	0	0	0
		76-1	United States	Uruguay	1976–81	Improve human rights	reduction of economic aid: 5, reduction of military aid: 5	0	0	0
		77-1	United States	Paraguay	1977–81	Improve human rights	reduction of military aid: 2	0	0	0
		77-3	United States	Argentina	1977–83	Improve human rights	reduction of military aid: 20, of arms sales: 20, of US ExImBank loans: 20	0	0	0
		77-7	United States	Brazil	1977–84	Improve human rights	reduction of military aid: 52, of US Eximbank loans : 42	0	0	0
		77-8	United States	Ethiopia	1977–92	1) Settle expropriations claims 2) Improve human rights	reduction of military aid: 22, reduction of economic aid: 16, tariffs: 10	0	0	0
		79-2	United States	Pakistan	1979–2001	Adhere to nuclear safeguards; stop pursu	period 1979-1997: reduction of economic aid and reduction of military aid: 316, military equipment paid but whithheld: 115	0	0	0
		84-2	United States	Lebanon	1984–97	1) Reaction to hostage taking by militias 2) Disarm Hezbollah	reduction of military aid: 20, travel ban: 8	0	0	0
		86-1	United States	Syria	1986–	Terminate support for international terroris	restrictions on the delivery of dual use goods: 2.3, loss of the « Wheat export subsidy » : 2	0	0	0
		90-2	United States	El Salvador	1990–93	1) Improve human rights 2) End civil war	reduction of military aid: 58	1	0	0
		91-3	United States	Thailand	1991–92	Restore constitutional regime	reduction of military aid: 22, reduction of economic aid: 16	0	0	0
		94-3	United Nations,	Rwanda	1994–95	Stop civil war	reduction of aid : 21	0	0	0
		95-1	United States	Peru	1995–98	End border conflict	reduction of military aid and arms supplies: negligible for Peru	0	0	0
		95-1	United States	Ecuador	1995–98	End border conflict	reduction of military aid and arms supplies: negligible for Ecuador	0	0	0

Restrictions targeting mainly		Case no.	Principal sender	Target country	Active years	Goals of sender country	Main sanction: annual cost in current dollars	Success	Trade Dispute	Threat
		96-4	United States	Colombia	1996–98	1) Stop drug trafficking 2) Improve human rights	reduction of military aid: 35.2, of US ExImbank and OPIC loans: 84	0	0	0
The exports of the Target country	Very specific goods and services (procurement contracts…)	79-3	Arab League	Canada	1979	Deter planned move of embassy in Israel	reduction in imports: 6	1	0	0
		83-1	Australia	France	1995–96	Stop nuclear testing in South Pacific	restrictions on proposals by French companies to bid on Australian defense projects: negligible	0	0	0
		83-2	United States	USSR	1983	Retaliation for downing of Korean airliner	temporary flight ban from and to Soviet Union: negligible	0	0	0
		92-1	Economic Com	Liberia	2000–06	End support for the Revolutionary United	embargo on timber imports 24, embargo on diamond imports 32, economic aid:43	0	0	0
		92-8	United Nations,	Cambodia, Khm	1992–	1) Ban Khmer Rouge 2) Establish democracy	ban on log imports : negligible	0	0	0
		98-3	Turkey	Italy	1998–99	Extradite leader of the Kurdish Workers'	threat to put some restrictions on proposals by Italian companies to bid on defense projects	1	0	1
	Trade barriers (tariffs …)	75-2	United States	USSR	1975–94	Liberalize Jewish emigration	suspension of MFN status: 53, restrictions on ExImbank loans: 49	0	0	0
		83-5	United States	Romania	1983–89,	1) Improve human rights 2) Ease restrictions on emigration	suspension of MFN status: 197, restrictions on ExImbank loans: 38	0	0	0
		83-5	United States	Romania	1990–93	3) Establish democracy, elections	suspension of MFN status: 197, restrictions on ExImbank loans: 38	0	0	0
		92-9	USSR/Russia	Estonia	1992–99	Increase rights of Russian minority	tariffs increase: 11.4	0	0	0
		95-2	European Unio	Turkey	1995	Improve human rights	delay in implementing the custom union: negligible since never applied	1	0	0
		96-5	United States,	Paraguay	1996	Deter coup attempt	threat of economic sanctions from Brasil, Argentina, Uruguay (in particular: exclusion from MERCOSUR)	0	0	1
	Major export resource (hydrocarbons sector, agricultural products…)	51-1	United States,	Iran	1951–53	1) Reverse the nationalization of oil facilities 2) Destabilize Mussadiq government	embargo on oil imports: 136	0	0	0
		54-1	USSR	Australia	1954	Repatriate a Soviet defector	embargo on wool imports: 50	0	0	0
		60-1	United States	Dominican Rep	1960–62	1) Cease subversion in Venezuela 2) Destabilize Trujillo government	embargo on sugar imports: 12.5	0	0	0
		78-8	United States	Libya	1978–2004	Destabilize Gadhafi	embargo (mainly oil): >250	0	0	0
		78-8	United States	Libya	1978–2004	Stop pursuit of chemical, nuclear weapons	embargo (mainly oil): >250	1	0	0
		79-1	United States	Iran	1979–81	1) Release hostages 2) Settle expropriation claims	Iranian imports embargo: 1892, asset freezing: 1200	1	0	0
		90-1	United States,	Iraq	1990–91	1) Withdraw from Kuwait 2) Release hostages	period 1990-1991: embargo on oil imports: 13600	0	0	0
		90-1	United States,	Iraq	1991–2003	1) Renounce weapons of mass destructio	period 1991-2003 : embargo on oil imports: 12450	1	0	0
		90-1	United States,	Iraq	1991–2003	2) Destabilize Hussein government (US g	period 1991-2003 : embargo on oil imports: 12451	0	0	0
		65-1	United States	Chile	1965–66	Roll back copper price increase	threat to reduce copper imports, to suspend aid and promise to remove tariff on copper.	1	1	1
		91-7	USSR/Russia	Turkmenistan	1991–95	Increase rights of Russian minority	embargo on gas imports: 1071	1	0	0
		93-7	USSR/Russia	Kazakhstan	1993–96	1) Secure nuclear weapons and military basing rights 2) Autonomy for ethnic Russians 3) Rights regarding Kazakh energy resources	embargo on oil imports: 523	1	0	0
		38-1	United States,	Mexico	1938–47	Settle expropriation claims	embargo on oil imports: 2, restriction on ExImbank loans: 1	1	1	0
	All the exports or large market access restriction	33-1	United Kingdon	USSR	1933	Release two British citizens	embargo on imports: 4	1	0	0
		46-1	Arab League	Israel	1946–	Create a homeland for Palestinians	boycott: 346	0	0	0
		58-1	USSR	Finland	1958–59	Adopt pro-USSR policies	embargo on imports: 45	1	1	0
		86-4	France	New Zealand	1986	Repatriation of French agents	restriction on the volume of agricultural exports to the European Community: 0 since solved before, French customs delaying tactics: 1.3	1	0	0
		92-1	Economic Com	Liberia	1992–98	End civil war	embargo on imports: 99	0	0	0

Restrictions targeting mainly		Case no.	Principal sender	Target country	Active years	Goals of sender country	Main sanction: annual cost in current dollars	Success	Trade Dispute	Threat
		92-10	China	France	1992–94	Cancel arms sales to Taiwan	major barrier to Chinese market access: 126	1	0	0
		92-13	USSR/Russia	Latvia	1992–98	Increase rights of Russian minority	delay in implementing the trade agreement: negligible since never applied: 14, blocage des exportations à la frontière: 19	0	0	0
Total trade	Trade embargos during periods of war	14-1	United Kingdom	Germany	1914–18	Military victory	blockade: 843	0	0	0
		39-1	Alliance powers	Germany	1939–45	Military victory	blockade: Germany 400	0	0	0
		39-1	Alliance powers	Germany	1939–45	Regime change	blockade: Germany 400	0	0	0
		39-1	Alliance powers	Japan	1939–45	Military victory	blockade: Japan 288	0	0	0
		39-1	Alliance powers	Japan	1939–45	Regime change	blockade: Japan 288	0	0	0
		50-1	United States, U	North Korea	1950–	1) Impair military potential	blockade: 42	0	0	0
		50-1	United States, U	North Korea	1950–	2) Destabilize communist government	blockade: 42	0	0	0
		82-1	United Kingdom	Argentina	1982	Withdraw troops from Falklands Islands	embargo: 945	0	0	0
		83-4	United States, C	Grenada	1983	Destabilize Bishop-Austin regime	blockade: negligible, since sanctions were in force for only a few days before invasion.	0	0	0
	Other total trade embargos	18-1	United Kingdom	Russia	1918–20	1) Renew support for Allies in World War	blockade and civil war: 446	0	0	0
		54-3	Spain	United Kingdom	1954–84	Gain sovereignty over Gibraltar	blockade: 5	0	0	0
		54-4	United States, S	North Vietnam	1954–74	1) Impede military effectiveness of North Vietnam 2) Retribution for aggression in South Vietnam	embargo: 283 –approximately-,	0	0	0
		60-3	United States	Cuba	1960–1989	1) Settle expropriation claims 2) Destabilize Castro government	embargo: around 2850 if we do not include the Soviet offset, 150 otherwise	0	0	0
		60-3	United States	Cuba	1990-	1) Settle expropriation claims 2) Destabilize Castro government	embargo: 3200	0	0	0
		60-3	United States	Cuba	1960–1989	3) Discourage Cuba from foreign military a	embargo: around 2850 if we do not include the Soviet offset, 150 otherwise	0	0	0
		63-2	Indonesia	Malaysia	1963–66	Promote "Crush Malaysia" campaign	embargo: 29	0	0	0
		65-3	United Nations,	Rhodesia	1965–79	Majority rule by black Africans	embargo: 130	1	0	0
		81-1	United States	Nicaragua	1981–90	1) End support for El Salvador rebels 2) Destabilize Sandinista government	embargo: 110	0	0	0
		82-3	South Africa	Lesotho	1982–86	1) Return refugees suspected of anti-state activities 2) Destabilize Chief Jonathan	blockade: 27	1	0	0
		89-1	India	Nepal	1989–90	Reduce ties with China	blockade and abrogation of treaties: 132	1	0	0
		89-4	Turkey, Azerbai	Armenia	1989–	Withdraw from Nagorno-Karabakh	blockade: 794	0	0	0
		91-1	United Nations,	Yugoslavia	1991–2001	End civil war in Bosnia, Croatia	embargo: 3385	0	0	0
		91-5	United States, U	Haiti	1991–94	Restore democracy	embargo: 349	0	0	0
		93-5	United States	Sudan	1993–	End support for international terrorism	embargo: 23.6	0	0	0
		94-1	Greece	Macedonia	1994–95	Change name of nation	blockade: 109	0	0	0
	Other restrictions affecting both the exports and the imports	49-1	United States, C	China	1949–70	2) Impair military potential	unilateral US embargo : no figure	0	0	0
		72-1	United States, U	Uganda	1972–79	1) Retaliation for expelling Asians 2) Improve human rights 3) Destabilize Amin government	restrictions on trade: 36	0	0	0
		78-6	Arab League	Egypt	1978–83	Withdraw from Camp David process	embargo: 34	0	0	0
		81-2	United States	Poland	1981–87	1) Lift martial law 2) Free dissidents 3) Resume talks with Solidarity	reductions on trade: 338, on US Exlmbank loans: 77	0	0	0
		85-1	United States, E	South Africa	1985–91	End apartheid	restrictions on oil delivery: 320, restriction on trade with the US: 210	1	0	0
		93-3	United Nations	Angola, UNITA	1993–2002	1) End civil war 2) Promote democracy	embargo on diamonds exports: 60, restrictions on oil and arms deliveries: 45	0	0	0

Restrictions targeting mainly		Case no.	Principal sender	Target country	Active years	Goals of sender country	Main sanction: annual cost in current dollars	Success	Trade Dispute	Threat
		97-1	United Nations,	Sierra Leone	1997–2003	Stop civil war	blockade by ECOWAS countries: 50, restrictions on RUF diamonds imports: 5	0	0	0
	Modest scale: economic bilateral aid and/or multilateral aid/credits	48-4	USSR	Yugoslavia	1948–55	1) Rejoin Soviet Camp 2) Destabilize Tito government	restrictions on loans: 36, suspension of payments (obligations): 35	0	0	0
		57-2	France	Tunisia	1957–63	Halt support for Algerian rebels	reduction of economic aid: 31	0	0	0
		56-4	United States	Laos	1956–62	1) Destabilize Prince Souvanna Phouma government 2) Destabilize General Phoumi government 3) Prevent communist takeover	reduction of economic aid and reduction of military aid: 5	0	0	0
		62-3	USSR	Romania	1962–63	Limit economic independence	threat to reduce economic aid	0	0	1
		63-4	United States	South Vietnam	1963	1) Ease repression 2) Remove Nhu 3) Destabilize Diem	reduction of economic aid: 9	0	0	0
		65-2	United States	India	1965–67	Alter policy to favor agriculture	food aid: 41	1	0	0
		71-1	United States	India, Pakistan	1971	Cease fighting in East Pakistan (Banglade	reduction of economic aid to India: 79	0	0	0
		77-2	United States	Guatemala	1977–2005	Improve human rights	figures annualized over the whole period : reduction of multilateral loans : 9.1, reduction of military aid: 4.3, reduction of economic aid: 2.7	0	0	0
		79-2	United States	Pakistan	1979–2001	Adhere to nuclear safeguards; stop pursu	period 1998-2001: reduction of multilateral loans from IMF: 200	0	0	0
		81-4	European Comı	Turkey	1981–86	Restore democracy	reduction of economic aid and loans- bilateral (West Germany), multilateral (European Community, European Investment Bank): 96	0	0	0
		86-3	Greece	Turkey	1986–99	1) Renounce claims to Aegean Island 2) Withdraw troops from Cyprus 3) Improve human rights	reduction of economic aid and reduction of multilateral loans –European Union, European Investment Bank-: 69	0	0	0
		89-2	United States	China	1989–	1) Retaliation for Tiananmen Square 2) Improve human rights	reduction of World Bank loans: 195, export credits: US, Japan, European Community, Canada: 79	0	0	0
		91-4	United States, I	Indonesia	1991–97	1) Improve human rights 2) End conflict, human rights violations in East Timor	reduction of economic aid: 148	0	0	0
		91-6	United States, E	USSR	1991	Block coup, restore Gorbachev governme	suspension of all existing agreements with the Soviet Union, including farm credits, withdrawal of credit guarantees to sale of grain to USSR, reduction of multilateral loans (World Bank, IMF), of aid (United Kingdom, European union, Japan, Canada): negligible, since coup ended before sanctions implemented	0	0	0
		92-6	United States	Cameroon	1992–98	1) Establish democracy 2) Improve human rights	reduction of economic aid and reduction of military aid: 19.6, but economic aid reduction is more significant	0	0	0
		93-4	United States, E	Nigeria	1993–98	1) Improve human rights 2) Establish democracy 3) Stop drug trafficking	reduction of economic aid: 116	0	0	0
		94-4	United States, E	The Gambia	1994–98	Restore democracy	reduction of economic aid: 25	0	0	0
		98-1	United States	India	1998–2001	1) Retaliate for nuclear test 2) Constrain nuclear program	reduction of economic aid: >315, reduction of multilateral loans: >250	0	0	0
		99-2	United States, E	Ivory Coast	1999–2002	Restore democracy	reduction of economic aid: 40	0	0	0
		99-3	United States, J	Pakistan	1999–2001	Restore democracy	reduction of economic aid and reduction of military aid: negligible since aid was already suspended	0	0	0
		00-1	United States	Ecuador	2000	Prevent coup attempt	US officials threaten to reconsider support for IMF loans and to cut aid and discourage foreign investment. OAS General secretary threatens political isolation and economic sanctions.	0	0	1

Restrictions targeting mainly			Case no.	Principal sender	Target country	Active years	Goals of sender country	Main sanction: annual cost in current dollars	Success	Trade Dispute	Threat
Financial flows	Large scale: economic bilateral aid and/or multilateral aid/credits	Economic aid	48-1	United States	Netherlands	1948–49	Recognize Republic of Indonesia	reduction of aid: 14	1	0	0
			62-1	United States	Brazil	1962–64	1) Settle expropriation claims 2) Destabilize Goulart government	reduction of economic aid and restriction on loans: 110	0	0	0
			64-1	France	Tunisia	1964–66	Settle expropriation claims	reduction of economic aid: 8, duty on importations of Tunisian wine-: 7	0	1	0
			68-1	United States	Peru	1968	Forgo aircraft purchases from France	reduction of economic aid: 33	0	1	0
			75-4	United States	Kampuchea	1975–79	1) Improve human rights 2) Deter Vietnamese expansionism	reduction of economic aid: 39	0	0	0
			77-6	United States	El Salvador	1977–81	Improve human rights	reduction of economic aid: 9	0	0	0
			78-1	China	Albania	1978–83	Retaliation for anti-Chinese rhetoric	reduction of economic aid: 27, reduction of bilateral trade-: 16	0	0	0
			78-7	China	Vietnam	1978–88	Withdraw troops from Kampuchea	reduction of economic aid: 330	0	0	0
			82-2	Netherlands	Suriname	1982–91	1) Improve human rights 2) Limit alliance with Cuba and Libya 3) Reverse coup	reduction of economic aid: 100 and then 18	1	0	0
			83-3	United States	Zimbabwe	1983–88	1) Temper opposition in United Nations to US foreign policy 2) Resume food shipments to Matabeleland 3) Apologize for anti-US rhetoric	reduction of economic aid: 27	0	0	0
			87-2	United States	Haiti	1987–90	1) Improve human rights 2) Restore democracy 3) Stop drug smuggling	reduction of economic aid: 56	0	0	0
			87-3	United States	El Salvador	1987–88	Reverse amnesty decision	threat to reduce economic aid	1	0	1
			88-1	United States, E	Burma	1988–	1) Improve human rights 2) Restore democracy	reduction of economic aid: 180	0	0	0
			88-2	United States, U	Somalia	1988–	1) Improve human rights 2) End civil war	reduction of economic aid and reduction of military aid: 63, but the reduction of economic aid is more significant	0	0	0
			89-3	United States	Sudan	1989–	1) Improve human rights 2) End civil war 3) Restore democracy	reduction of economic aid: >345	0	0	0
			90-3	United States, V	Kenya	1990–93	1) End political repression 2) Establish democracy	reduction of economic aid: 189	0	0	0
			90-4	United States, E	Zaire	1990–97	Establish democracy	reduction of economic aid: 298	0	0	0
			90-6	United States, S	Jordan	1990–97	Enforce UN embargo vs. Iraq	reduction of economic aid: 315	0	0	0
			91-8	United States	Peru	1991–95	1) Improve human rights 2) Promote democracy	reduction of economic aid: 135	0	0	0
			92-2	EC/EU, France,	Togo	1992–	1) Establish democracy 2) Improve human rights	reduction of economic aid: 57	0	0	0
			92-3	United States, U	Malawi	1992–93	1) Establish democracy 2) Improve human rights	reduction of economic aid: 138	1	0	0
			92-4	European Union	Equatorial Guin	1992–2000	1) Establish democracy 2) Improve human rights	reduction of economic aid: 27	0	0	0
			92-8	United Nations,	Cambodia, Khn	1997–	2) Establish democracy	reduction of economic aid: 82	0	0	0
			92-11	United States	Nicaragua	1992–95	1) Strengthen civil control over military 2) Settle expropriation claims	reduction of economic aid: 53	1	0	0
			93-2	United States, E	Guatemala	1993	Reverse coup	reduction of economic aid: 144	1	0	0
			96-1	East African me	Burundi	1996–99	Restore democracy	reduction of economic aid: 99, trade embargo: 25	0	0	0
			96-2	United States, E	Niger	1996–2000	Restore democracy	reduction of economic aid: 89	0	0	0
			96-3	United States, V	Zambia	1996–98	1) Improve human rights 2) Constitutional reform	reduction of economic aid: 91	0	0	0

Restrictions targeting mainly			Case no.	Principal sender	Target country	Active years	Goals of sender country	Main sanction: annual cost in current dollars	Success	Trade Dispute	Threat
		Multilateral credits	61-1	United States	Ceylon	1961–65	Settle expropriation claims	restriction on multilateral loans (World Bank): 10.5, reduction of economic aid: 2.5	1	1	0
			70-1	United States	Chile	1970–73	1) Settle expropriations claims 2) Destabilize Allende government	restrictions on multilateral loans -World Bank, InterAmerican Development Bank-: 106, trucker's strike financed by CIA: 53	0	0	0
			91-4	United States, I	Indonesia	1999–2002	Independence for East Timor	restriction on multilateral loans multilatéraux –IMF, World Bank-: 300	1	0	0
			92-5	European Unior	Algeria	1992–94	Promote democracy	restrictions on multilateral loans European community -freeze on balance of payment loans-: 12	0	0	0
		Bilateral credits	60-2	USSR	China	1960–70	1) Retaliate for break with Soviet policy 2) Impair Chinese economic and military potential	restrictions on bilateral loans loans: 167, decrease in exportations: 44, decrease in importations from China: 76	0	0	0
			63-1	United States	United Arab Re	1963–65	Cease military activity in Yemen and Con	restrictions on multilateral loans US développement: 39, food aid: 15	0	0	0
			86-2	United States	Angola	1986–92	1) Expel Cuban troops 2) Opposition to Marxist government	restrictions on ExImbank loans: 4	0	0	0
		Mostly multilateral aid and credit combined	63-3	United States	Indonesia	1963–66	1) Cease "Crush Malaysia" campaign	reduction of economic aid and restrictions on multilateral loans IMF: 107	0	0	0
			63-3	United States	Indonesia	1963–66	2) Destabilize Sukarno government	reduction of economic aid and restrictions on multilateral loans IMF: 108	0	0	0
			68-2	United States	Peru	1968–74	Settle expropriation claims	reduction of military and economic aid: 25, restrictions on multilateral loans-World Bank, IMF,IDB-: 15.5	1	1	0
			77-5	United States	Nicaragua	1977–79	1) Destabilize Somoza government 2) Improve human rights	restrictions on multilateral loans IMF 10, reduction of economic aid: 9, reduction of military aid: 3	0	0	0
			79-4	United States	Bolivia	1979–82	1) Improve human rights 2) Deter drug trafficking	restrictions on multilateral loans World Bank: 41, reduction of economic aid: 26	0	0	0
			92-7	United States	Azerbaijan	1992–2002	End Armenia embargo	reduction of economic aid: 5, restrictions on export credits (Eximbank/OPIC): 5	0	0	0
	Access to dollar credits to pay for oil imports		56-3	United States	United Kingdon	1956	Withdraw troops from Suez	Restrictions on access to dollar credits to pay for oil imports: 167	1	0	0
	Others	Asset freezing and expropriations	57-1	Indonesia	Netherlands	1957–62	Control of West Irian	ban on Dutch shipping: 36, expropriation of Dutch firms: 33	0	0	0
			99-1	United States, l	Afghanistan	1999–2002	Extradite Osama bin Laden	asset freezing: 25	0	0	0
			56-2	United States, l	Egypt	1956	1) Ensure free passage through Suez canal 2) Compensate for nationalization	asset freezing: 93, withholding of payments -reduction in operating revenues from Suez Canal -: 63	0	0	0
		Restrictions on investments	98-2	United States, E	Yugoslavia, Ser	1998–1999	1) Stop aggression in Kosovo	restriction on investments 750, asset freezing: 160	0	0	0
			98-2	United States, E	Yugoslavia, Ser	1998–2001	2) Destabilize Milosevic	restriction on investments: 750, asset freezing: 160	0	0	0
		withholding of payments	44-1	United States	Argentina	1944–47	1) Remove Nazi influence 2) Destabilize Peron government	ban on repatriation of Argentine gold reserves held in US: 11, denial of Lend-Lease aid (military): 18	0	0	0
			71-2	United Kingdon	Malta	1971	Reinstitute defense agreement	withholding of payments: 6.1, lost income during departure of British troops and families: 7.7	0	1	0
			87-1	United States	Panama	1987–90	Destabilize Noriega	withholding of payments: 181, asset freezing: 32	0	0	0
			21-1	League of Natic	Yugoslavia	1921	Block Yugoslav attempts to wrest territory from Albania; retain 1913 borders	threats to prevent all financial, commercial or personal intercourse between the nationals of the covenant-breaking State and the nationals of any other State (Art 16 of League Of Nations Covenant)	0	0	1

Restrictions targeting mainly		Case no.	Principal sender	Target country	Active years	Goals of sender country	Main sanction: annual cost in current dollars	Success	Trade Dispute	Threat
Large scale combinations of trade and financial restrictions		25-1	League of Natic	Greece	1925	Withdraw from occupation of Bulgarian border territory	threats to prevent all financial, commercial or personal intercourse between the nationals of the covenant-breaking State and the nationals of any other State (Art 16 of League Of Nations Covenant)	0	0	1
		35-1	League of Natic	Italy	1935–36	Withdraw Italian troops from Abyssinia	embargo on exportations: 34, furniture of non strategic goods: 43, forced sale of gold: 9	0	0	0
		49-1	United States, (	China	1949–70	1) Retaliation for communist takeover and subsequent assistance to North Korea	rough figures: embargo on Chinese exportations: 45, restrictions on strategic good deliveries: 59, asset freezing : 8	0	0	0
		54-4	United States, S	North Vietnam	1975–98	1) Account for MIAs 2) Withdraw from Cambodia 3) Improve human rights	tariffs (withdrawal of MFN status): 315 (over 4 years), restriction on loans: 88 (over 4 years), asset freezing: 15 (over 15 years)	0	0	0
		61-2	USSR	Albania	1961–65	1) Retaliation for alliance with China 2) Destabilize Hoxha government	suspension of trade agreements: 16, aid reduction: 15	0	0	0
		61-3	United States, \	German Democ	1961–62	Berlin Wall	threat to withhold credits, and threat of trade embargo	0	0	1
		67-1	Nigeria	Biafra	1967–70	End civil war	blockade: 160, loss of monetary reserves from change in new Nigerian currency: 72	0	0	0
		75-5	United States	Chile	1975–90	1) Improve human rights and resolve Letelier case	reduction of economic aid: 21, tariffs: 18, reduction of military aid: 15	1	0	0
		75-5	United States	Chile	1983-1990	2) Restore democracy	reduction of economic aid: 21, tariffs: 18, reduction of military aid: 15	0	0	0
		84-1	United States	Iran	1984–	1) Terminate support for international terrorism 2) End war with Iraq 3) Renounce weapons of mass destruction	figures annualized over the whole period: embargo on Iranian oil imports: 201, restriction on investments: 166	0	0	0
		87-4	India, Australia, Fiji		1987–2001	1) Restore democracy 2) Modify constitution to protect minority rights	reduction of economic aid: 5.8, perte du prix préférentiel lors de l'exportation de sucre: 2.7	0	0	0
Atypical cases	Antiboycott law, expulsion of workers…	48-2	India	Hyderabad	1948	Assimilate Hyderabad into India	currency and other financial/trade controls on imports and financial transactions with Hyderabad: 18	0	0	0
		54-2	India	Portugal	1954–61	Assimilate Goa into India	isolation of Goa: negligible, since isolation of Goa did not result in significant increases in aid from Portugal	0	0	0
		76-3	United States	Arab League	1976–	Antiboycott restrictions on US firms	increased import costs -foregone tax benefits-: 8	0	0	0
		90-6	United States, S	Yemen	1990–97	Enforce UN embargo vs. Iraq	citizens expelled -loss of worker remittances-: 450	0	0	0
		94-2	Greece	Albania	1994–95	Release jailed ethnic Greek leaders	reduction of economic aid:16, citizens expelled -loss of worker remittances- : 45	1	0	0

Source: Author, based on HSE, 2007, Economic sanctions reconsidered, 3rd ed

Les Déterminants du Succès des Sanctions Economiques

1 Introduction

L'un des premiers usages connus des sanctions économiques date de 432 av. J.C. lorsque Pericles a mis en place le décret mégarien qui limitait l'entrée de produits de Mégare sur les marchés athéniens. Après la Première Guerre Mondiale, les sanctions sont apparues comme une alternative crédible à l'usage de la force, notamment défendue par Woodrow Wilson. Aujourd'hui, les sanctions économiques sont utilisées de plus en plus fréquemment et celles-ci peuvent même viser des économies de taille importante comme la Russie ou l'Iran. L'usage accru de cet outil a suscité des discussions substantielles parmi les cercles académiques et politiques, sur les questions suivantes :

— Est-ce que les sanctions sont un instrument efficace et si oui pour quels objectifs ?
— Quelles variables affectent l'efficacité des sanctions ?

Par sanctions économiques, on entend ici la "limitation (ou la menace de limitation) délibérée, décidée ou inspirée par un Etat, des relations commerciales ou financières coutumières dans le but d'atteindre un objectif politique." [1]. La première vague de recherches sur le sujet des sanctions (dans les années 1960 et 1970) était marquée par un consensus : les sanctions sont moins efficaces que la force militaire [2]. Dans les années 1980, une nouvelle vague de recherches a estimé que les sanctions internationales étaient à même d'atteindre des objectifs politiques, mêmes ambitieux. La première étude de taille N sur ce sujet a été celle de Gary Hufbauer, Jeffrey Schott, et Kimberly Ann Elliott avec *Economic Sanctions Reconsidered* en 1985. Dans la dernière édition de leur étude, en 2007, les auteurs ont obtenu un taux de succès de 34%. Ce sont les données issues de cette édition qui constituent la base de la présente étude.

2 Transformation de la base de données

Chacun des 204 épisodes de sanction entre 1914 et 2002 qui constituaient la base initiale (développée par Hufbauer, Schott et Elliott en 2007) a été revu complètement en se replongeant dans l'histoire du cas, en analysant les instruments employés et leurs effets économiques.
Pour chaque cas, la base initiale présentait deux notes, chacune comprise entre 1 et 4. La première composante évaluait à quel point l'objectif politique avait été atteint (1 étant un échec et 4 un large succès). La seconde était à propos de la contribution de la sanction à ce résultat (1 étant une contribution négative et 4 une contribution réellement décisive). Les deux composantes étaient ensuite multipliées : si le score était de 9 ou plus (impliquant donc que les sanctions ont au minimum contribué de manière substantielle à des objectifs au moins partiellement réalisés), le cas était noté comme succès. La méthode a cependant fait l'objet de critiques, de la part de Robert Pape [3] notamment. Elles sont de quatre ordres :

— dans plusieurs cas, l'objectif n'était même pas atteint ;
— dans de nombreux cas, la causalité entre le changement de politique observé et la sanction n'est pas établi. Ce serait plutôt la force qui aurait joué un rôle déterminant ;
— la manière de déterminer le succès par simple multiplication est trop sommaire ;
— des différends commerciaux ont été inclus dans la base alors qu'ils ne constituent pas une sanction à proprement parler (il n'y a pas d'objectif politique à atteindre par des moyens économiques, mais uniquement un objectif économique).

Avec ses critères appliqués à la base de données, Pape obtient un taux de succès de 4% seulement. Même si les critiques qu'il développe sont recevables, il a adopté une approche maximaliste et rejetait systématiquement le succès en cas de doute. L'approche de la causalité qui a conduit à la base utilisée dans cette étude a été intermédiaire :
i) un épisode dans lequel une action militaire ou une guérilla a été décisive ne peut pas être considéré comme un succès des sanctions ;
ii) cependant, si la sanction économique a exercé une pression importante et qu'il est impossible d'identifier un autre facteur qui aurait clairement causé le changement politique, la sanction est considérée comme un succès.
Ainsi, dans la base finale, 36 cas sur 204 ont été classés comme des succès (17,6%).

1. définition basée sur celle de Gary C. Hufbauer, Jeffrey J. Schott, and Kimberly A. Elliot, *Economic Sanctions Reconsidered : History and Current Policy*, 1990
2. Klaus Knorr, *The Power of Nations : The Political Economy of International Relation*, 1975
3. Robert A. Pape, *Why Economic Sanctions Do Not Work*, 1997

3 Le modèle

Telle qu'elle est codée dans la base de données, la variable d'intérêt (*Success*), notée Y par la suite, est binaire. Elle prend la valeur 1 quand la sanction économique a permis la réalisation de l'objectif politique et 0 sinon (si l'objectif n'est pas atteint ou si c'est un élément autre que la sanction qui a entraîné la changement politique désiré). Le cadre d'analyse standard est le suivant : pour qu'une sanction réussisse, il faut que les coûts de "non-mise en conformité" (c'est-à-dire de ne pas changer sa politique, et de subir une sanction) soient supérieurs aux coûts de mise en conformité (devoir changer sa politique). Cette idée peut être transcrite sous forme de fonctions d'utilité espérée. Un épisode donné de sanction i a les caractéristiques suivantes X_i (période, relations diplomatique et économique entre les pays, type de sanction économique, objectif politique, etc.). On note l'utilité espérée du pays cible associée à la mise en conformité de sa politique $U(1, X_i)$. La mise en conformité implique des sacrifices pour le gouvernement du pays cible : nécessité de changer sa politique, aveu de faiblesse, etc. Elle apporte également des bénéfices : elle permet d'éviter les coûts de la sanction, de restaurer au moins partiellement les relations diplomatiques et économiques entre les deux pays, etc. L'ensemble de ces effets de sens opposés est résumé dans l'utilité espérée. Avec un raisonnement similaire, $U(0, X_i)$ représente l'utilité espérée de la cible dans la situation où le pays destinataire refuserait de changer sa politique.
Ainsi, pour qu'un épisode de sanction soit un succès, il faut que $U(1, X_i) > U(0, X_i) \Leftrightarrow U(1, X_i) - U(0, X_i) > 0$
Alors, pour compléter la variable dichotomique Y, on introduit une variable latente Y_i^* telle que

$$\mathrm{Y}_i = \begin{cases} 1 & \text{si } Y_i^* > 0 \\ 0 & \text{si } Y_i^* \leq 0 \end{cases} \; avec \; Y_i^* = X_i \cdot \beta + \epsilon_i \; (1)$$

β est le vecteur des coefficients associés aux variables explicatives et ϵ_i est le terme d'erreur, normalement distribué : $\epsilon_i \sim N(0, 1)$. La probabilité Pr d'un succès ($Y_i = 1$) est donc une fonction non linéaire de plusieurs variables explicatives (la matrice X_i). En considérant un modèle probit, on a $Pr(Y_i = 1) = \Phi(X_i \cdot \beta)$ avec Φ la fonction de répartition de la loi normale centrée réduite.

4 Les résultats

4.1 Choix du modèle

Deux modèles ont été sélectionnés. Le premier contient douze variables explicatives choisies parmi les 42 à disposition, selon deux critères :

- des études de référence sur le sujet des sanctions économiques ont montré que ces variables pouvaient avoir un effet direct sur la probabilité de succès d'un épisode de sanction ;
- ou bien ces variables ont été créées pour les besoins spécifiques de cette étude, dans le but de vérifier l'hypothèse développée au sein du Ministère de l'Economie et des Finances, affirmant que les sanctions les plus efficaces sont celles qui affectent la balance des paiements de manière asymétrique [4].

Le second modèle comprend un sous-groupe de sept variables explicatives parmi les douze évoquées précédemment. Ce modèle réduit a été sélectionné parmi les $2^{12} = 4096$ modèles possibles incluant les douze variables précédemment choisies. Le modèle réduit est celui dont l'*Akaike Information Criterion* est le plus faible [5].
Tous deux donnent lieu à des résultats comparables, tant en termes de signes que de significativités des coefficients.

4.2 Résultats par variable

- ***PoliticalAmbition*** **: Effet négatif**
  Cette variable est discrète, prenant des valeurs entre 1 : objectif modeste (différend commercial par exemple) et 4 : objectif très ambitieux (fin de guerre civil, changement de régime par exemple). Comme attendu, plus l'objectif politique est ambitieux, moins probable est le succès. Il existe en effet une relation directe entre l'ambition de l'objectif et le coût de mise en conformité pour la cible.
- ***StrongExports*** **: Effet positif**
  La variable dichotomique a été créée pour voir si une sanction qui affecte fortement les exportations du pays cible augmente la probabilité de succès de la sanction. Le signe de ce coefficient fait l'originalité de cette étude. Il met en lumière le rôle clef joué par le type d'instrument utilisé pour la sanction, dont l'importance est souvent

4. *Sanctions économiques : quelles leçons à la lumière des expériences passées et récentes ?* Lettre Trésor Nº150, 2015
5. Kenneth P. Burnham et David R. Anderson, *Model Selection and Multimodel Inference : A Practical Information-Theoretic Approach*, 2002

sous-estimée, dans la théorie comme dans la pratique des sanctions économiques [6]. Les sanctions qui ont le plus d'effet sont celles qui affectent significativement la balance des paiements. En d'autres mots, pour une efficacité maximale, une politique de sanctions doit affecter les échanges commerciaux de manière asymétrique, ciblant ceux qui contribuent à accroître les réserves du pays cible, tels que les exportations.

— ***PriorRelation*** **: Effet positif**
Pour décrire la relation diplomatique avant la sanction, elle peut prendre trois valeurs : 1 étant "antagoniste" et 3 "cordiale/alliés". Le succès d'une sanction est plus probable contre un ancien allié que contre un ennemi. Plusieurs hypothèses peuvent l'expliquer : l'effet peut passer par le coût de mise en conformité : il est moins humiliant et coûteux de céder face à un ami qu'un ennemi. Autre hypothèse : le coût des sanctions est plus large que le strict coût économique. Tenir tête à un pays ami dans un épisode de sanctions implique également de perdre un allié et des perspectives de coopération future.

— ***TargetRegime*** **: Effet positif**
La variable décrivant le régime de la cible peut prendre trois valeurs : 1 étant l'autocratie et 3 la démocratie. Une démocratie est plus sensible à une sanction économique qu'une dictature. On peut comprendre ce résultat par le canal de transmission des sanctions. Ce qui compte, *in fine*, est l'analyse coût-bénéfice du décideur politique. Dans une démocratie, si la population est insatisfaite des lourdes sanctions pesant sur elles, elle punira les dirigeants au cours de l'élection suivante. Dans une dictature, ce canal est beaucoup moins direct, et l'élite dirigeante est plus imperméable aux sanctions.

— ***TradeLinkage*** **: Effet positif**
La variable est égale à la moyenne pré-sanction de la part des exportations et des importations de la cible faites avec l'émetteur de la sanction. Elle est donc un indicateur de la dépendance économique de la cible envers l'émetteur de la sanction. La dépendance économique de la cible vis-à-vis de l'émetteur donne à ce dernier de plus grandes chances de succès. Un pays cible qui entretient d'importants liens économiques avec l'émetteur sait que ce dernier peut aisément serrer la vis et accroître la pression sur l'économie domestique. La faible significativité est en lien avec la littérature sur les sanctions. Gibson et al [7] ont montré que la dépendance envers l'émetteur ne jouait que peu sur le succès des sanctions.

— ***GnpRatio*** **: Effet non significatif**
Cette variable est calculée comme le ratio du PIB de l'émetteur sur celui de la cible. Il n'a pas d'effet direct sur la probabilité de succès. Un pays loin de sa cible, même s'il est bien plus gros, n'aura vraisemblablement qu'une faible relation commerciale avec elle. Il aura donc un levier de pression faible. Plus que le différentiel de taille, c'est la dépendance de la cible, les soutiens aux belligérants, et la sanction effectivement mise en place qui vont être déterminants dans le succès de la sanction.

— ***CostTarget*** **: Effet non significatif**
Cette variable représente le coût moyen (en % du PIB) de la sanction pour le pays cible tout au long de l'épisode. La variable n'a pas d'effet significatif sur la probabilité de succès. Deux mécanismes potentiels auraient pourtant pu jouer, chacun allant dans une direction différente. Une augmentation du coût économique pour la cible augmente d'une part le coût de "non mise en conformité", ayant donc un effet positif sur la probabilité de succès. D'autre part, elle augmente le coût politique de "mise en conformité" : la population cible s'unit contre la sanction, c'est l'effet "Rally 'round the flag" qui opère dans l'adversité. Pour expliquer l'absence de significativité de $CostTarget$, il est important de souligner sa forte corrélation avec $StrongExports$, indiquant que les sanctions qui sont coûteuses en termes de points de PIB sont également celles qui affectent de manière importante les exportations du pays cible. Même si l'information véhiculée par ces deux variables présente des similitudes, $StrongExports$ est un meilleur prédicteur. En effet, cette variable est à la fois plus simple, apporte des informations additionnelles sur la balance de paiement et est mieux construite. En effet, elle se passe du "*sanction coefficient*" affecté de manière subjective par Hufbauer, Schott et Elliott à chaque cas de sanction.

— ***StrongFinancial*** **: Effet non significatif**
Cette variable est construite en symétrique de $StrongExports$, elle prend la valeur 1 lorsque la sanction vise prioritairement à affecter le financement du pays cible. Alors que $StrongExports$ a un effet significatif sur la probabilité de succès, $StrongFinancial$ n'a pas d'influence directe sur cette probabilité. Ainsi, s'attaquer fortement au financement du pays cible est beaucoup moins efficace que de toucher la balance des paiements.

— ***CooperationLevel*** **: Effet non significatif**
Le niveau de coopération avec l'émetteur va de 1 : aucune coopération à 4 : un effort majeur et coordonné pour limiter le commerce ou les flux financiers. Le degré de coopération avec l'émetteur n'a pas d'effet significatif sur l'efficacité des sanctions. Une hypothèse pour expliquer ces résultats serait une annulation mutuelle de deux effets potentiels : la coopération permet à la fois de limiter les contournements et est un frein à l'efficacité puisque la coordination est difficile et lente à obtenir. Plus la coalition de pays est importante, plus il est difficile de mettre en place un régime de sanctions qui satisfasse l'ensemble des pays émetteurs.

6. *Sanctions économiques : quelles leçons à la lumière des expériences passées et récentes ?* Lettre Trésor №150, 2015

7. Jaleh Dashti-Gibson, Patricia Davis and Benjamin Radcliff, *On the Determinants of the Success of Economic Sanctions : an Empirical Analysis*, American Journal of Political Science,1997

— ***SupportTarget*** **: Effet non significatif**
Un soutien affiché au pays cible, diplomatique ou économique, n'a pas d'effet sur la probabilité de succès de la sanction.
— ***CostSender*** **: Effet non significatif**
Cette variable, représentant le coût pour l'émetteur peut prendre quatre valeurs, de 1 : gain net pour l'émetteur jusqu'à 4 : perte majeur. A nouveau, on peut tenter d'expliquer ce résultat par deux phénomènes de sens opposés. Une sanction coûteuse pour l'émetteur est difficile à maintenir dans la durée, mais montre en même temps sa forte détermination à obtenir le changement politique désiré.
— ***HealthStability*** **: Effet non significatif**
Cet indice créé par les auteurs de la base pour donner un niveau de stabilité économique et politique dans le pays cible peut prendre trois valeurs, avec 1 : "détresse" : un pays où les problèmes économiques sont sévères avec une crise politique et 3 : "fort et stable" : une économie saine et un système politique fonctionnant normalement. On pouvait conjecturer que cette variable aurait un effet sur le succès en augmentant la capacité de contournement des sanctions, par une économie stable et sous contrôle. Cependant, cette capacité de contournement est directement incluse dans la variable $CostTarget$. On aurait cependant pu imaginer d'autres effets potentiels, la variable résume en effet la stabilité économique mais aussi politique. Le gouvernement d'un pays instable politiquement perçoit différemment les coûts politiques de mise en conformité. Ces effets ne semblent cependant pas avoir de validité empirique.

5 Tests de robustesse

Pour vérifier la robustesse du modèle, quatre tests ont été conduits et tous confirment la validité de celui-ci : le signe des coefficients ne change pas, tout comme la significativité des coefficients.

— Modèle Logit : la fonction de lien est modifiée pour devenir un modèle logit : la valeur des coefficients change, mais pas leur signe ni leur niveau de significativité.
— Outliers : douze cas sont enlevés de la base de données, trois parce que le coût de la sanction pour la cible est beaucoup plus élevé que dans les autres cas (jusqu'à près de 78% du PIB) et neuf parce les sanctions y ont été utilisées en cas de conflit armé. La sanction devient alors une arme pour affaiblir l'adversaire militairement et non un moyen d'obtenir une concession politique.
— Différends commerciaux : en lien avec la définition des sanctions économiques reprise en introduction, les différends commerciaux sortent de ce cadre : la décision de concéder y est le fruit d'une maximisation strictement économique alors que le propre de la sanction est de comparer des coûts politiques et économiques. De plus, leur taux de succès est plus élevé que pour les sanctions économiques à proprement parler. Le test consiste à réintroduire les neuf cas de différends commerciaux dans la base de données.
— Les interventions unilatérales américaines : les Etats Unis sont de loin le premier émetteur de sanctions économiques. Cela pourrait donner lieu à des coefficients biaisés s'il existait un effet propre d'avoir les Etats Unis comme pays émetteur. En effet, ils sont à la fois le premier acteur des marchés économiques et financiers, mais possèdent également l'armée la plus puissante. En ajoutant la variable binaire d'une "intervention unilatérale américaine" comme contrôle, on observe que cette dernière n'est pas significative et que les autres coefficients n'évoluent pas.

6 Conclusion

Cette analyse contribue à l'étude de l'efficacité des sanctions économiques de trois manières. D'abord, l'ensemble des cas inclus dans la base de données de référence publiée en 2007 par Hufbauer Schott et Elliott sont revus pour notamment leur appliquer une définition plus précise du succès. Ensuite, cette base revue est utilisée pour tester les conclusions présentées par d'autres études, confirmant certaines d'entre elles et infirmant d'autres. Enfin, trois nouvelles variables ont été ajoutées, deux d'entre elles étant significatives. La première mesure l'ambition de l'objectif politique désiré, sur une échelle de quatre et montre que plus l'objectif est ambitieux, plus faibles sont les chances de succès. La seconde variable significative créée est binaire, elle indique qu'une sanction qui affecte fortement les exportations du pays cible a de meilleures chances d'être couronnée de succès.
Ces résultats ouvrent donc des pistes pour de futures recherches sur les déterminants de l'efficacité des sanctions économiques. Alors que la base développée par Hufbauer, Schott et Elliott a longtemps été considérée comme la référence principale sur le sujet, il apparaît nécessaire de reconsidérer certains cas de succès. De plus, le type de sanction mise en place est une variable majeure qui pourrait mériter une attention plus grande dans les articles académiques futurs.

The Determinants of the Success of Economic Sanctions

1 Introduction

One of the most famous early uses of economic sanctions occurred as early as 432 B.C. when Pericles issued the "Megarian decree" that limited the entry of products from Megara into Athenian markets. After World War I, sanctions began to appear as a credible alternative to the use of force. They were considered as a potential "*economic, peaceful, silent, deadly remedy*", in the words of Woodrow Wilson. The increasing use of this tool has generated substantial discussion in policy and academic circles, addressing the following issues :

— Can sanctions be successful, and for what purposes ?
— Which variables do affect the degree of effectiveness ?

Sanctions are defined as "*the deliberate, government-inspired withdrawal, or threat of withdrawal, of customary trade or financial relations in order to attain a political objective*". The first major wave of research on the topic of sanctions (in the 1960s and 1970s) reached a consensus that they were not as effective as military force [1]. In the 1980s, a new wave of research estimated that sanctions could achieve ambitious political objectives. A key evidence supporting the argument was the large-N study conducted by Gary Hufbauer, Jeffrey Schott, and Kimberly Ann Elliott with *Economic Sanctions Reconsidered* in 1985. In the last edition of their study (2007), the authors obtained a success rate as high as 34%.

2 Database transformation

The initial database built by the three authors in 2007 contained 204 cases of sanctions, from 1914 to 2002. For this paper, each one has been reviewed from both a historical and an economical point of view.
For each case, the authors assigned two grades, each one scaled from 1 to 4. The first component assesses the extent to which the political objective was achieved (1 being a failed outcome and 4 a positive outcome where the goals were largely realized). The second one is about the sanctions' contribution (1 being a negative contribution and 4 a decisive contribution). The two components are then multiplied : if the score is 9 or above (meaning that sanctions made at least a substantial contribution to the goals that were at least partially realized), the case is a success. However, the methodology used in the study has been strongly criticized by Robert Pape [2]. Criticisms are of four kinds :

— In several instances, the political objective sought by the sanction was not achieved ;
— In many other cases, the causality between the change of policy and the economic sanctions has not been proved ;
— The way of discriminating successes and failures (the simple multiplication of two arbitrary grades) is extremely rough ;
— Trade disputes have to be excluded from the sample since they do not fit with the definition of economic sanctions and have a higher success rate.

With his criteria applied to the database, Pape obtained a rate of success of 4% only. Even if the criticisms that were developed by Pape are generally acceptable, the way he assessed causality reflects a maximalist approach (in case of doubt, sanctions were not considered as determinant in achieving the positive outcome). This paper adopts an intermediary position about causality :
(i) an episode in which a military action or a guerilla was decisive cannot be considered as a success ; however
(ii) an episode in which the economic sanction exerted important pressure and in which it is impossible to identify another factor that clearly determined the outcome is considered as a success.
Thus, 36 cases (out of 204 case) are considered as successes in the reassessed database (17,6%).

3 The model

The outcome of a sanction episode i (denoted Y_i), as considered in the reviewed database, is either successful ($Y_i = 1$) or unsuccessful ($Y_i = 0$). The standard framework for analysis is the following : the costs of defiance borne

1. Klaus Knorr, *The Power of Nations : The Political Economy of International Relation*, 1975
2. Robert A. Pape, *Why Economic Sanctions Do Not Work*, 1997

by the target must be greater than its perceived costs of compliance to succeed. This idea can be translated in terms of utility functions.
A given sanction episode i has the following characteristics X_i (period, relation between the countries, type of economic sanction, political objective, etc.). It is assumed that compliance brings a utility $U(1, X_i)$ to the target. As a matter of fact, compliance implies a political sacrifice for the target government (need to change policies, admission of failure, etc.) and brings rewards (avoidance of economic costs imposed by sanctions, improvement of the relations between the countries, etc.). The pros and cons of compliance are summed up in $U(1, X_i)$. The reasoning is similar for the utility $U(0, X_i)$ associated to non-compliance.
Thus, the condition for the case to succeed is : $U(1, X_i) > U(0, X_i) \Leftrightarrow U(1, X_i) - U(0, X_i) > 0$
However, each government's utility function is unknown and cannot be directly deduced from the dataset. What is observed is a dichotomous variable.
Hence it is necessary to introduce a latent variable Y^* (unobservable) :

$$\mathrm{Y}_i = \begin{cases} 1 & \text{si } {Y_i}^* > 0 \\ 0 & \text{si } {Y_i}^* \leq 0 \end{cases} \textit{ where } {Y_i}^* = X_i \cdot \beta + \epsilon_i \ (1)$$

β is the vector of coefficients associated to the explanatory variables and ϵ_i is the error term, normally distributed ($\epsilon_i \sim \mathcal{N}(0, 1)$). The probability of a success is thus a nonlinear function of several explanatory variables (the matrix X_i). Here we assume that the model is a probit. Hence $Pr(Y_i = 1) = \Phi(X_i \cdot \beta)$ where Φ is the normal cumulative distribution function.

4 Results

4.1 Model choice

Two models have been selected. The first one includes twelve explicative variables that have been chosen among the 42 variables available. This choice has been made according to two criteria :

- the selected variable has proven relevant in theoritical or empirical studies related to economic sanctions ;
- or this variable has been built by the authors to test the following hypothesis : sanctions have greater chances to succeed when the instrument is well-designed. Practitioners of economic sanctions at the French Ministry for the Economy and Finance wanted to test it through a large-N empirical study [3].

The second model only includes a subset of the previous variables. To select that reduced model, all of the possible models including the twelve variables have been tested ($2^{12} = 4096$ possibilities) through an algorithm that has selected the one minimizing the *Akaike Information Criterion* [4].
The two models yield comparable results in terms of signs and statistical significance of the coefficients.

4.2 Effect of each variable

- ***PoliticalAmbition*** **: Negative effect**
  This variable is discrete, taking values from 1 : "modest objective" (trade dispute for instance) to 4 : "very ambitious objective" (end a civil war or ask for a regime change for example). As expected, the more ambitious the objective, the less probable the success. There exists a direct correspondence between the ambition of the objective sought and the political cost of compliance for the target country.
- ***StrongExports*** **: Positive effect**
  This dichotomous variable has been created to test if a sanction affecting strongly the exports of the target country has greater chances to succeed. The sign of the coefficient makes this analysis stand out. It highlights the key role played by the type of instrument implemented, whose importance is often underestimated, theoretically and practically [5]. Sanctions that have an important effect are the ones that significantly affect the balance of payments. In other words, for maximum economic effectiveness, a sanctions policy must affect trade flows asymmetrically, targeting the flows that contribute to increasing the target country's reserves, such as export flows out of the target country.
- ***PriorRelation*** **: Positive effect**
  The discrete variable has been created for this study, taking values from 1 : "antagonistic" to 3 : "cordial" to describe the diplomatic relation before the sanction. Success is more probable against a former ally than

3. *Sanctions économiques : quelles leçons à la lumière des expériences passées et récentes ?* Lettre Trésor Nº150, 2015
4. Kenneth P. Burnham et David R. Anderson, *Model Selection and Multimodel Inference : A Practical Information-Theoretic Approach*
5. *Sanctions économiques : quelles leçons à la lumière des expériences passées et récentes ?* Lettre Trésor Nº150, 2015

against a former enemy. Several underlying mechanisms could explain this result. Firstly, the effect can go through the political cost of compliance : it is less humiliating and costly for the leader to comply with an ally's requirement. Secondly, the cost of sanctions is broader than the simple economic cost. Losing an ally is losing some diplomatic support and prospects for future cooperation.

— ***TargetRegime*** **: Positive effect**
This variable created for this study describes the political regime of the target and can take three values, from 1 : autocracy to 3 : democracy. A sanction against a democracy is more effective than against an autocracy. Sanctions that impose costs only on the masses, leaving elites unscathed are less likely to succeed since it is the elite that makes policy decisions. However, in democracies, reelection is an important component in the political decision making process. Thus elites are not insulated from sanctions that harm the masses. The relation between the economic cost borne by the target country and the cost of sanctions as considered by the leader is more straightforward in democracies.

— ***TradeLinkage*** **: Positive effect**
This variable indicates the economic dependence (exports and imports) of the target on the sender country. More dependence implies a higher leverage for the sender country. When leverage is high, the coerced leaders know that the sender country can easily turn the screw and increase the pressure on the domestic economy. While $CostTarget$ measures the actual costs of the sanction for the target country, $TradeLinkage$ is an indicator for the potential costs that could occur if the target country does not comply.

— ***GnpRatio*** **: Non significant**
This variable is computed as the ratio of the sender's GNP over the target's GNP. It has no direct effect on the probability of success, but might have an indirect one. Big economies often play key roles on financial and trade markets. Hence they have more leverage and should be able to implement tougher sanctions that are more difficult to evade. Therefore, the effect of *GnpRatio* on the probability of success can go through the leverage ($TradeLinkage$) or through the intensity of the sanction itself ($CostTarget$ for the target and $CostSender$ for the sender).

— ***CostTarget*** **: Non significant**
The variable represents the average cost (in terms of % of GNP) over the sanction period. This variable has no significant effect on the probability of success. However, two potential mechanisms could have played a role, in opposite directions. An increase in the economic cost for the target increases the cost of non compliance and has a positive effect on the probability of success. On the other side, it increases the political cost of compliance : hardship caused by sanctions creates a "*rally 'round the flag effect*". To explain the absence of direct effect of $CostTarget$, it is important to highlight its strong correlation with $StrongExports$, meaning that the sanctions that hit strongly the exports of the target are the costliest sanctions. The variables $StrongExports$ and $CostTarget$ convey similar information, but $StrongExports$ is a better predictor. Indeed, it is simpler, it provides some additional information about the balance of payments and is better constructed. $CostTarget$ involves an important judgmental component : the "sanctions coefficient" that is estimated by Hufbauer Schott and Elliott specifically for each case.

— ***StrongFinancial*** **: Non significant**
Similarly to $StrongExports$, the variable equals 1 if the sanction primarily targets the financing of the target country. While $StrongExports$ has a significant effect on the success rate, $StrongFinancial$ has no direct influence on this rate. Hitting strongly the financing of the target country is much less efficient than affecting its balance of payments through cuting its exports.

— ***CooperationLevel*** **: Non significant**
The cooperation level with the sender country goes from 1 : no cooperation to 4 : major and coordinated effort to limit trade and/or finance. The level of cooperation with the sender country has no direct effect on success. It is possible that two opposite effects cancel each other : on the one hand, more cooperation makes the sanction harder to evade and on the other hand, coordination and cooperation issues make the process slower and weaker. The more countries take part in the sanction episode, the harder it is to decide on a package of sanctions satisfaying all of the sender countries.

— ***SupportTarget*** **: Non significant**
A public support to the target country, either diplomatic or economic, has no effect on the sanction's probability of success.

— ***CostSender*** **: Effet non significatif**
This variable representing the cost for the sender country can take four values, from 1 : "net gain" to 4 : "major loss". Once more, it is possible to explain this result by two opposite effects. The cost borne by the sender country could have a negative effect on the success rate since a costlier sanction is harder to sustain and might create a domestic political backlash. The effect could also be opposite since a costly sanction sends a credible signal and constitutes a demonstration of resolve.

— ***HealthStability*** **: Non significant**
This index captures the economic and political environment in the target country prior to the sanction. It

takes values from 1 : "distress" (a country with very severe economic problems coupled with political turmoil) to 3 : "strong and stable" (a country with the government in firm control and a healthy economy). Contrary to expected results, less stable countries do not have more difficulties to face sanctions by finding alternative suppliers or domestic substitutes for the goods sanctioned. We could have imagined other potential effects since an unstable governments has a different perception of the political costs of compliance. However, these theoretical mechanisms do not seem to have empirical validity.

5 Robustness checks

Robustness is necessary to obtain valid causalities, thus we implement a series of four tests and all of them are conclusive : statistical significance and signs of the coefficients do not evolve.

— The link function is changed to implement a logit model. As expected, the coefficients do change, but not their sign. Despite small changes in the significance levels, the group of variables identified as significant by the Logit model is consistent with the estimation based on the Probit model.

— Outliers : twelve cases are removed from the database.
Three of them are removed because the computed costs borne by the target state is really high compared to the rest of the sample (up to 78% of GNP).
Nine of them are due to the context of the sanction : these are cases in which the sanction was used to support an ongoing war between the sender and the target. They cannot be compared to the rest of the database. In those nine cases, sanctions were not used as a diplomatic tool that constituted an alternative to military force but simply as a weapon among others to weaken and defeat the enemy.
As in the previous test, there is no change either in the sign of coefficients, or in the variables that are considered as significant.

— Trade disputes : in agreement with the definition of economic sanctions stated in the first part of the paper, trade disputes should not be considered as economic sanctions. In trade disputes, countries make their decision through a wealth maximization problem whereas countries subject to sanctions or implementing sanctions do have to assess whether the political objectives are worth the economic costs. Moreover, the success rate for trade disputes is much higher than for the rest of the sample. The reincorporation of the nine cases of trade disputes in the sample yields similar results. As in the previous tests, there is no change either in the sign of coefficients, or in the variables that are considered as significant.

— U.S. unilateral interventions : the U.S. are by far the predominant sender of economic sanctions. This could lead to biased coefficients in the model if there exists a direct effect of a U.S. intervention. The U.S. are the biggest player on the trade and financial markets and have the most powerful army. Thus, it appears necessary to control for a U.S. effect. However there is no meaningful change either in the coefficients, or in the variables that are considered as significant. The U.S. variable is not significant, meaning that the fact that the U.S. are the only sender country has no direct effect on the success of a sanction episode.

6 Conclusion

This paper makes a contribution to the study of sanction efficacy in three ways.
Firstly, it reassesses all the cases included in the database developed by Hufbauer, Schott and Elliott (a main reference on the subject of economic sanctions) and applies to them a definition of success that is more precise than the one used by the three authors in their book.
Secondly, the reassessed database is used to test the conclusions put forward in earlier studies, confirming some of them while undermining others.
Thirdly, three new variables have been created and two of them have high levels of significance. The first one measures the political ambition of the objective sought by the sender country from one to four. The more ambitious the objective, the smaller the chances of success. The second significant variable is a dummy variable that takes the value one when the main sanction implemented strongly affects the exports of the target state. The paper highlights the importance of the type of instrument in the sanctions' efficacy. The sanctions that harm the exports of the target country have much greater success rates, all other things remaining equal.

Our findings also signal a direction for future research on sanctions. While the database built by Hufbauer, Schott and Elliott has long been considered as the main reference on the subject of economic sanctions, it appears necessary to reconsider some of the claimed successes. Moreover, the type of sanction implemented is a key variable that may deserve more attention from scholars.

Présentation des missions du second stage

Pour mon second stage (1er mars au 30 août 2017), j'ai rejoint Criteo en tant que *Central Data Analyst* dans l'équipe CAX (*Central AX*).

Présentation de Criteo

Criteo réalise des bannières publicitaires dynamiques et centrées sur l'utilisateur. Le choix des produits mis en avant ainsi que l'esthétique de la bannière sont faits de manière automatique pour correspondre au mieux aux attentes de l'utilisateur. Pour cela, Criteo s'appuie sur les données de navigation individuelles de type cookies.

Présentation de mon équipe

L'équipe *Central AX* est intégrée dans le service *Central Ops*, au sein des bureaux parisiens. Elle a deux missions principales, que j'ai eu tour à tour à remplir :

- support aux *Data Analyst* « locaux » (c'est à dire dédiés à un marché et en lien direct avec les clients de Criteo) pour la performance des campagnes publicitaires ;
- support aux équipes centrales pour leur apporter une expertise analytique.

I) Ma mission de soutien aux *Data Analysts* locaux

1) Les besoins

Une fois qu'une campagne de reciblage publicitaire est active, c'est à dire qu'un client réalise plus de 1000 impressions sur 90 jours glissants, sa performance est suivie par un *Data Analyst* appartenant au même marché que le client. Il est donc dit « local ». Pour cela, il dispose d'instruments mis à disposition par Criteo : classeurs réalisés avec le logiciel Tableau, Git Repository centralisant des requêtes SQL pré-écrites, systèmes d'alerte en temps réel Grafana, etc.

Lorsqu'une campagne présente un défaut de performance, c'est à dire que le nombre de ventes, de clics, ou que la marge de Criteo présente un motif anormal, le *Data Analyst* cherche à résoudre le problème avec les moyens dont il dispose. Lorsque le problème est trop complexe, d'ampleur trop importante, ou que la solution est hors de sa portée technique, il « escalade » le problème à l'équipe de *Central AX* sous la forme de tickets *Jira.*

De par sa proximité avec les équipes de R&D ou avec les équipes dédiées à chacun des produits proposés par Criteo, l'équipe CAX possède une vision plus globale et plus technique des différents produits de l'entreprise. Elle bénéficie également d'un accès sans restriction à l'ensemble des données collectées, permettant de dimensionner les problèmes.

2) Les tâches que je pouvais remplir

Ma mission en lien avec le support aux équipes locales a évolué au fil des mois, en même temps que ma maîtrise de l'écosystème Criteo.

i) A mon arrivée

A mon arrivée, je me contentais d'assigner les tickets aux différents membres de l'équipe. Pour cela, il s'agissait d'être capable de comprendre rapidement à quel produit un problème était lié et ainsi d'attribuer le ticket à l'expert dédié à ce produit dans l'équipe. Je suivais également la résolution de chaque ticket pour apprendre les méthodes.
Pour les tickets les plus complexes, faisant intervenir la R&D, j'avais également un rôle de coordination entre les équipes.

ii) Au bout d'un mois

Au bout d'un mois, j'étais capable de prendre totalement en charge la résolution des tickets les plus simples. Je montais également en compétence sur des tickets plus complexes liés à *l'architecture Data*, et la fraude au clic. Cette spécialisation est le fruit d'un intérêt personnel pour ces problématiques ainsi que de circonstances qui ont rendu ces sujets populaires au sein de l'entreprise:

- Des cas de surchauffe sur les serveurs de Criteo ont conduit à des problèmes sur la qualité de la donnée à disposition des analystes, exigeant donc que quelqu'un soit à même de centraliser l'information et de la communiquer largement aux équipes locales. Nous avons donc mis en place un système d'alertes standardisées, envoyant un email aux équipes concernées à chaque incident concernant la *data*. Cette mission nécessite une compréhension très fine de l'architecture de la donnée dans l'entreprise. En effet, lorsque l'une des sources primaires de données est affectée (les *logs* qui enregistrent l'activité des utilisateurs sur les sites des clients de Criteo par exemple), de nombreuses applications se voient affectées en cascade. Il faut donc comprendre l'ensemble de l'arborescence ainsi que les mécanismes de dédoublage, les temps d'actualisation, etc.

- Mon arrivée a coïncidé avec une période d'explosion des suspicions de trafic invalide (IVT). Par ce terme, on désigne des visites ou impressions publicitaires qui sont considérées comme non naturelles ou frauduleuses. Nous avons donc mis en place des séries de procédures et de bonnes pratiques pour aborder ces cas de suspicions, en en automatisant certains *via* R. Pour distinguer un cas de fraude, certaines métriques doivent être regardées : le nombre de clics par *user_id* (variable interne à Criteo), par *hashed IP*, par *user agent*, le *click through rate* pour ces utilisateurs, le nombre de ventes liées à cette activité, le délai entre deux clics, etc. Pour chacune de ces métriques, des seuils d'alerte étaient fixés pour avoir une balance entre faux positifs et faux négatifs. Ce sujet est extrêmement sensible pour les clients de Criteo, qui exigent que les clics qui leur sont facturés correspondent effectivement à une activité humaine et soient donc susceptibles de générer des ventes. La multiplicité des métriques rend également le sujet complexe et les techniques de fraudes tendent à se perfectionner pour être beaucoup plus difficilement détectables.

iii) A partir de 3 mois de stage

Après, j'ai donc pu acquérir une véritable expertise sur ces deux sujets, pour lesquels je suis devenu une référence dans l'équipe. Par défaut, j'étais celui qui traitais ces tickets, qui étais invité aux réunions inter-équipes régulières, etc. Les résultats des procédures mises en place par l'équipe ont commencé à se faire sentir puisque le nombre de tickets liés à ces deux

problèmes a largement diminué : grâce à nos feuilles de route, les *Data Analysts locaux* étaient à même de gérer les problèmes à leur échelon.

II) Ma mission de soutien aux équipes centrales

En seconde partie de stage, du fait de réorganisations au sein des équipes de *Central Ops*, j'ai complètement changé de spectre. Ma mission principale n'était plus le support aux *Data Analyst locaux*, mais le support aux équipes centrales. La nature de mon travail a de ce fait complètement évolué. Je venais principalement soutenir deux équipes, sur des aspects analytiques.

1) L'équipe *Central Sales Ops*

Cette équipe, voisine de la nôtre, fait principalement du suivi de performance commercial. A ce titre, ils mettent à disposition des commerciaux et du management des outils de suivi de performance majoritairement appuyés sur le logiciel Tableau. Ces outils nécessitent une maintenance constante, pour les faire évoluer aussi vite que les produits changent, que les équipes bougent et que les objectifs commerciaux se transforment.
J'avais donc à ma charge la maintenance d'une dizaine de ces rapports, certains à grande visibilité ou bien du fait du nombre de vues hebdomadaires (plusieurs milliers) ou de leur sensibilité (suivis régulièrement par le *top management*).
Parmi les tâches que j'avais à faire sur ces rapports, on peut principalement distinguer *feature request, bugs* et maintenance de routine.

i) Feature request

Au cours de la vie d'un rapport Tableau, celui-ci s'enrichit de fonctionnalités qui sont ajoutées au fil de l'eau, selon les besoins de ses différents utilisateurs. Ces demandes d'ajout de fonctionnalité étaient discutées de manière hebdomadaire entre l'équipe *Central Sales Ops* et moi-même. L'équipe jugeait du bienfondé de la demande quand je me chargeais d'évaluer sa faisabilité ainsi que le temps nécessaire à la mise en place. Ces demandes ne sont pas prioritaires, comparées aux cas de *bugs.*

ii) Bugs

Du fait de la complexité des rapports Tableau, de nombreux bugs apparaissent, lors de changements de situation notamment.
Par exemple, un manager change d'équipe et, de ce fait, a besoin d'accéder à la fois aux données de son ancienne équipe et de la nouvelle, pendant la période de transition. La base de données RH, qui sert de référence pour l'attribution des droits de visualisation, ne prend pas en compte cette complexité. Il faut donc ajouter des exceptions manuellement dans chacun des rapports Tableau concernés, tout en prévoyant de les faire expirer à la fin de la période de transition.
Parfois, les bugs sont d'origine complètement inconnue et l'investigation peut être longue. Les sources de problèmes sont en effet multiples, de la source de la donnée à l'utilisateur final :

- des problèmes dans les bases de données de Criteo ;
- une erreur dans la requête SQL qui sert à extraire les informations des bases pour s'en servir dans le logiciel Tableau ;

- un problème dans la manière de construire le rapport au sein du logiciel Tableau ;
- une erreur dans la mise en ligne du rapport Tableau, sur les serveurs partagés de l'entreprise (problème d'actualisation, d'extraction de bases, etc.).

iii) Maintenance de routine

Certaines tâches de maintenance arrivent de manière régulière et sont peu à peu automatisées. Par exemple, à chaque changement de trimestre, les rapports Tableau indiquant la performance doivent être gelés pour que le management puisse en extraire les performances individuelles utilisées pour le calcul des bonus. Les résultats doivent être figés, mais également les mouvements des employés entre équipes ou les réaffectations de compte. Après une semaine, l'ensemble des rapports doit être dégelé et transitionné au trimestre suivant.
Criteo a également fait évoluer l'architecture de l'ensemble de ses bases de données pendant ma présence dans l'entreprise, afin d'uniformiser les noms de variable ou les manières de calculer les champs. Il a donc fallu adapter l'ensemble des requêtes SQL des rapports, en vérifiant la cohérence des données entre l'ancien et le nouveau *Data model.*

2) Ma mission pour l'équipe *Product Roll-out*

Cette équipe s'assure que les nouveaux produits lancés par Criteo sont adoptés par les clients. Pour cela, elle fixe des objectifs de *roll-out* aux différentes équipes locales. Chaque produit a toutefois un fonctionnement particulier et donc des modalités de suivi différentes : certains sont comptabilisés en nombre de clients, d'autres en taux d'acceptation par rapport aux clients éligibles, d'autres en part du bénéfice du client lié au produit, etc.
Ma mission a été de regrouper le suivi de l'ensemble des produits (plus d'une dizaine) au sein d'un rapport unique et non plus d'une multitude de fichiers Excel partagés. Ces différences de fonctionnement, combinées à la grande variété des sources de données a rendu la tâche de fiabilisation des données particulièrement complexe. Il a également fallu optimiser la requête SQL au plan algorithmique, afin que le temps d'exécution du rapport permette une navigation fluide. En quittant Criteo, le rapport était cependant complètement fonctionnel et avait des chiffres certifiés.