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Review

Oil spills, governance and institutional performance: The 1992 regime of liability and compensation for oil pollution damage

David Soto-Oñate*, Gonzalo Caballero

ERENEA, University of Vigo, 36310, Spain

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ABSTRACT

The oil industry is nowadays of vital importance for industrialized and developing countries. However, oil transportation continues to be a highly risky activity, both for the actors involved in its production and exchange and for the rest of society, producing enormous negative externalities. This article delves into the international system of liability and compensation for oil pollution damage (1992 CLC/CF) from the perspective of New Institutional Economics, evaluates its operation in practice across countries and its evolution over time. It reveals substantial heterogeneity in terms of performance across nations and the main drivers and obstacles to its transformation.

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* Corresponding author. University of Vigo, Faculty of Economic and Business Sciences, 36310 Vigo, Spain.
E-mail address: davidsoto@uvigo.es (D. Soto-Oñate).

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1. Introduction

The oil industry is currently of vital importance for both industrialized and developing countries. Much of the national and international oil movements are carried by sea. It is estimated that the amount of crude oil and petroleum products that was transported in 2015 by sea was around 2.8 billion tons (UNCTAD, 2016). Technological advances substantially improved the safety conditions and the monitoring and prevention capacities of the authorities. However, oil transportation continues to be a highly risky activity, both for the actors involved in its production and exchange and for the rest of society. Oil spills have brought about huge economic and environmental disasters, with the biodiversity of the affected ecosystems being irreversibly modified.

In economic analysis, environmental damage is a typical example of a negative externality (Pigou, 1920; Mishan, 1971). This is a situation in which the rights of agents who do not participate in the production and exchange of a good or service, and therefore do not benefit from them, are affected by its negative consequences.

The oil transportation, because it is likely to generate high costs for actors directly and not directly involved in the exchange, requires establishing institutional systems to allocate responsibilities and compensations in the event of a spill. However, the industry and the society as a whole are composed of a multitude of heterogeneous agents with different needs and interests. The construction of such institutional systems thus becomes highly complicated in complex societies, especially if several nations are involved in an international convention, as is the case analyzed in this paper. This diverse network of actors, interests, needs, resources and capacities, coupled with the heterogeneity of national institutions, conditions both the functioning of the institutional system across countries and the evolution of the international system over time. This article observes the 1992 international regime of liability and compensation for oil pollution damage from the perspective of New Institutional Economics and evaluates its design, its operation in practice across countries and its evolution over time.

The New Institutional Economics has led to significant advances in the study of the role of institutions in environmental matters. Among other things, it dealt theoretically and empirically with topics such as the impact of institutions and policy on the environment or how individuals organize themselves to design institutions in order to manage environmental issues (Vatn, 2005). Nowadays, it is well known how institutional factors may help to explain pollution levels throughout the world (Álvarez-Díaz et al., 2011) or how common pool resources may be effectively administrated by local users (Ostrom, 1990).

2. Social cost, transaction costs and institutions

2.1. Transaction costs and the role of institutions

As anticipated in the introduction, there are economic activities that may generate negative externalities—like, in this case, the production and transport of crude oil and petroleum products—causing costs to actors outside the transaction. The New Institutional Economics starts reasoning the externality and the social cost from the fundamental basis provided by Ronald Coase (1960).

In the past, there used to be a consensus in economics that anyone who caused negative externalities should be restrained, punished and/or obligated to provide an adequate compensation to the affected party. The so-called Pigouvian tax is a famous example. Pigou (1920) studied cases in which the marginal social benefit or loss diverges from the marginal private benefit or loss. He identified that a private actor could generate what he called uncharged services or disservices (externalities) to neighbors or a wider community. A way to rebalance this divergence, Pigou suggested, was the imposition by the State of "extraordinary restraints" or "extraordinary encouragements" by setting up a system of taxes and bounties. Pigou defended this idea "to capture, or internalize, externalities […] taxes equal to the externalities could equalize the private and social marginal costs" (Milne and Andersen, 2012, p. 15).

However, the idea that polluters should always bear the cost of the externality was not so clear for Coase. In his view, rather than wondering how to avoid A's harm—which generates a negative externality—over B—who suffers it—, society should wonder if A should be allowed to harm B. Coase sees the damage as reciprocal and understands that the restriction may also generate a cost to A. This question makes sense if we understand that the objective is to avoid the greater damage or promote the greater good in utilitarian terms. Coase warns: "What answer should be given is, of course, not clear unless we know the value of what is obtained as well as the value of what is sacrificed to obtain it" (Coase, 1960, p. 2).

In *The Problem of Social Cost*, Coase (1960) formulated a scenario, in which, independently of the court judgement with respect to a negative externality case, in a world without transaction costs, actors would be able to reach *ex post* agreements that would allow an efficient reallocation of property rights—i.e., transferring the rights to the hands that value them the most and achieving a social Pareto optimal. However, Coase and the New Institutional Economics have pointed out that the real world has positive and high transaction costs. Transaction costs—costs of getting and processing information, costs of designing, monitoring and enforcing contracts, etc.—, which are the equivalent of the concept of friction in physics, distort the ability of a market to bring about the exchanges that would lead to an efficient social outcome (Coase, 1960; Dahlman, 1979). Therefore, the initial distribution of property rights, the laws in force and the court judgements are of fundamental importance. These are part of the institutional framework of a society, which is determinant for the social outcome and is the object of analysis of the New Institutional Economics. Therefore, regardless of the position on the polluter pays principle, there is a wide consensus on the need of institutions

to deal with externalities.

Institutions are the rules of the game in a society. They consist of formal rules, informal constraints and enforcement mechanisms and configure the framework of incentives within which individuals make decisions (North, 1990)—e.g. on investment, on purchase, on risk bearing, etc. Institutions may affect positively or negatively the level of transaction costs and, in consequence, the performance of the market mechanisms. On the other hand, institutions provide governance structures to organize the allocation of resources and the relationship among the actors outside the market.

In a case of negative externality, like those of pollution from oil spills, institutions become essential to compel potential pollutants to ensure an optimal level of care through the configuration of the incentive structure, for instance, introducing fines, non-monetary sanctions or rules regarding liability and compensation. These measures make the producers of externalities assume the risks of a possible spill and, with it, to internalize the costs of their operation.

The international regime of liability and compensation for oil pollution damage—analyzed in this article—establishes who is liable, who are affected, what elements are included in the evaluation of the damage and to what extent the responsible actor must compensate the victims. It is a multilevel system, whose implementation and enforcement depend in a great deal on the national level.

However, institutions do not always reflect a functional purpose for the society. They can be the result of the balance of power, cultural orientations or historical inertias (path-dependence). This is why institutionalists have devoted so much attention to the process of institutional change and its drivers.

2.2. Institutional change

From its origins, the New Institutional Economics has made clear that the passage of time matters. Historical events can transform the existing institutions but also condition the subsequent steps that will take place in its evolutionary path. Although institutional change may be driven by such strong impacts as wars, revolutions, invasions or natural disasters, it is generally incremental (North, 1990). According to North (1995), the economies of scope, complementarities, and network externalities of an institutional matrix make institutional change overwhelmingly path-dependent, therefore institutional change is characterized by a slow evolution of formal rules and informal constraints in an incremental process that is heavily weighted in favor of policies that are broadly consistent with the basic institutional framework. Institutions are embedded in a broader social realm, so harmony becomes critical to their survival. If there is a conflict between two institutions it is likely that one ends up transforming, disappearing or being systematically unfulfilled.

North (1990), Roland (2004), Portes (2006), and others explain the capacity of culture, to prevent and promote change in formal institutions. On the other hand, the importance of power—the distribution of resources, bargaining power, the correlation of forces, etc.—is also emphasized in order to make the interests of some actors prevail over others in the process of institutional design and transformation (North, 1990; Acemoglu and Robinson, 2011). Section 6 will address the role of history, the balance of power and culture in the design and transformation of this international regime.

3. The international rules: 1992 CLC and 1992 FC

In the origins of the current convention is the two-tier system comprised of the *International Convention on Civil Liability for Oil Pollution Damage*—CLC hereafter—of 1967 and the *International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage*—hereafter FC for the Convention and IOPCF for the Fund—of 1971. In 1992, both conventions were amended, giving rise to the so-called new regime of CLC/FC 1992 which came into force in 1996. The 1971 Fund Convention (FC) ceased to be in force in 2002 and the International Oil Pollution Compensation Fund (IOPCF) 1971 ceased to exist with effect from the end of 2014. As of December 2016, 135 nations have ratified the 1992 CLC and 114 are members of the 1992 FC. As the IOPCF (2016, p.8) itself asserts, this two-tier compensation system of CLC/FC 1992 "was intended to ensure an equitable sharing of the economic consequences of marine oil spills from tankers between the shipping and oil industries".

The CLC determines the liability of shipowners for damages due to oil pollution. It establishes the principle of *strict liability* and creates a system of compulsory liability insurance for ships carrying more than 2,000 tons of oil. This strict liability means that it is not necessary to prove the fault to make the shipowner liable for the spill. The system provides three kinds of exemptions: a) the damage resulted from an act of war or natural disaster, b) it was completely caused by a deliberate act or omission by a third party, or c) it was completely caused by negligence of public authorities.

The shipowner is entitled to limit his/her liability in respect of any one incident to an aggregate amount that is linked to the units of tonnage of the ship. Currently, the owner can limit his/her liability to SDR 4.51 million[1]—US$6.12 million—if the vessel has a capacity of 5,000 gross tonnages (GT) or less, or otherwise SDR 4.51 million plus SDR 420 for each additional ton up to a maximum of SDR 89.77 million—US$ 121.8 million. The owner will lose the right to limit its liability if it is proved that the damage "resulted from his personal act or omission, committed with the intent to cause such damage, or recklessly and with knowledge that such damage would probably result" (Art. V.2).

On the other hand, the CLC establishes what has come to be called *channeling of liability* in the first instance towards the shipowner. This means that within the framework of the CLC, claims can only be made against the owner of the vessel and the obligation to compensate will be limited to the quantities mentioned in the previous paragraph. Claims against "the servants or agents of the owner, members of the crew, the pilot, the charterer—including bareboat charterer—, manager or operator of the ship, or any person carrying out salvage operations or preventive measures" (IOPCF, 2016a, p. 3) are not allowed. This controversial clause will be discussed later.

The Fund Convention (FC), which is voluntary and complementary to the CLC, establishes a fund to compensate those affected when the compensation provided by the CLC is not sufficient to cover all the damage. It is contributed by the oil industry,[2] according to the tonnage of oil received. In the year 2015, the countries that contributed the most were Japan (14%), India (13%), Netherlands (9%) and Korea (8%) (IOPCF, 2016b). Just like the shipowners under the CLC, there is a limitation of liability for the Fund, which currently stands at SDR 203 million—about US$ 275.5 million.

Since 2005 there is a third tier of compensation, the Supplementary Fund, which raises the available compensation to SDR 750 million (about US$ 1.018 billion). It contributes to this fund

[1] Special Drawing Rights (SDR) is an international reserve asset created by the IMF. SDR 1 equals to US$1.339692, as of January 1, 2017.

[2] Specifically "by contributions levied on any person who has received in a calendar year more than 150,000 tons of crude oil or heavy fuel oil after sea transport in a 1992 Fund Member State".

Table 1
The ten major disasters within the 1992 CLC/FC system.

Incident	Year	Location	Estimated oil spilled (tons)	Limitation of liability applicable to the Shipowner under 1992 CLC	Limit of compensation by the 1992 Fund	Admissible claims (under Convention)	Non-compensated damage (under Convention)
Prestige	2002	Spain, France and Portugal	63,200	SDR18.9 million ($34.64 million)	SDR135 million ($247.44 million)	€362.7 million ($521.18 million)	€191.2 million ($274.75 million)
Erika	1999	France	19,800	SDR 9.2 million($18.24 million)	SDR 135 million ($267.64 million)	€129.7 million ($188.38 million)	Nil
Hebei Spirit	2007	Republic of Korea	10,900	SDR 89.77 million ($159.71 million)	SDR 203 million ($361.15 million)	₩738 billion ($0.67 billion)	₩414.4 billion ($0.38 billion)
Natuna Sea	2000	Indonesia, Malaysia and Singapore	7,000	CLC'69: SDR 6.1million ($11.07 million); CLC'92: SDR 22.4 million ($40.64 million)	FC'71: SDR 60 million ($108.84 million); FC'92: SDR 135 million ($244.9 million)	Malaysia: £0.32 million ($0.66 million); Indonesia: £1.6 million ($3.32 million); Singapore: £4.7 million ($9.76 million)	Nil
Nakhodka	1997	Japan	6,200	SDR 1.59 million ($3.24 million)	SDR 135 million ($274.8 million)	¥26.1 billion ($0.3 billion)	Covered by an extrajudicial agreement
Baltic Carrier	2001	Denmark	2,500	SDR 9.7 million ($16.73 million)	SDR 10.66 million ($18.39 million)	DKK 107 million ($17.61 million)	Nil
Solar 1	2006	Philippines	2,100	CLC92: SDR 4.51 million ($8.15 million); STOPIA: SDR 20 million ($36.14 million)	SDR 203 million ($366.86 million)	₱ 986.7 million ($20.14 million)	Nil
Volgoneft 139	2007	Russia and Ukraine	1,200-2,000	SDR 4.51 million ($8.19 million)	SDR 203 million ($368.73 million)	₱503.2 million ($22 million)	Insurance gap: SDR 1.51 million ($2.74 million)
Slops	2000	Greece	1,000-2,500	Controversial	Controversial	€2.3 million ($3.01 million)	Nil. 1992 Fund covered it
JS Amazing	2009	Nigeria	≈1,000	SDR 4.51 million ($7.94 million)	SDR 203 million ($357.48 million)	Unknown	Unknown

Notes: Official valuation provided by the IOPC Funds. Figures are up to 01.07.2016; some cases are still open so figures may change. For the sake of orientation, the figures in brackets provide an approximate valuation at constant 2017 US dollars. Currency codes: SDR, special drawing rights; $, US dollar; ₽, ruble; ₱, Philippine peso; DKK, Danish krone; ¥: yen; €, euro; £, pound sterling; ₩, Korean won.

following the same logic of the 1992 FC. Currently, 31 countries are members of the Supplementary Fund.

In the same year, the International Group of P&I Clubs—13 insurance companies that together cover the liability insurance of the 98% of the global oil fleet—assigned a voluntary agreement known as Small Tanker Oil Pollution Indemnification Agreement (STOPIA). Under STOPIA, the liability limitation of shipowners increases to SDR 20 million for small vessels—up to 29,548 GT—for damages in 1992 IOPCF Member States. This coverage was extended to larger tankers in 2006 with the TOPIA, in virtue of which the International Group of P&I Clubs will cover the 50% of the compensations paid by the Supplementary Fund. In reality, these two agreements do not affect the amount available to compensate the victims; it is only a redistribution of the responsibility to indemnify between the shipping companies and the oil industry.

4. The international regime in practice: the ten major spills within the 1992 CLC/FC regime

This section analyzes the 10 largest oil spills under the 1992 CLC/FC regime. Table 1 presents a summary of the main characteristics of each event.

4.1. Prestige (Spain), 2002

In 2002, the *Prestige*,[3] a single-hull tanker registered in the Bahamas, suffered a break in its hull in the middle of a storm and ended up breaking in two and sinking about 260 km from the coast of Vigo (Spain). It released approximately 63,000 tons of fuel oil, affecting more than 200 km of coast mainly in Spain, but also in Portugal and France (Loureiro et al., 2006).

By that time, the three countries had ratified the 1992 CLC and the 1992 FC, therefore the shipowner's liability limitation stood at SDR 18.9 million—about today's US$34.64 million—and the Fund's limitation at SDR 135 million—around US$247.44 million.

The IOPC Fund received claims amounting to €1037 million in Spain—of which 984.8 million were claimed by the Spanish State—, €109.7 million in France and €4.3 million in Portugal. However, the Fund carried out its own assessments, estimating the admissible claims in Spain at approximately €303 million, the French at €57.5 million and the Portuguese at €2.2 million.[4]

Of this amount, and due to the limitation of liability, the level of payments ended up being at 30% for Spain and France and at 15% for Portugal. The level of payments is established so that the principle of equal treatment could be granted to all victims. Therefore, only a portion of the damages recognized—30%—will be compensated by the shipping and the oil industry, with the major part having to be assumed by the victims of the incident. In addition to this, the Spanish State advanced the payments to be made by the Fund, which were materialized slowly. As of October 2016, €50.5 million are still pending of payment (IOPCF, 2016c).

In addition, the Spanish State took legal action against several actors (Caballero and Soto-Oñate, 2017):

[3] For an in-depth review of this case, see Caballero and Fernández-González (2015).

[4] Other alternative estimates about the magnitude of the damage can be seen in Loureiro et al. (2006) and Garza-Gil et al. (2006).

- In the United States Court of Appels of Second Circuit, against the classification society, American Bureau of Shipping (ABS). The Court noted that "Spain has … failed to adduce sufficient evidence to create a genuine dispute of material fact as to whether Defendants recklessly breached that duty such that their actions constituted a proximate cause of the wreck of the Prestige" (US Court of Appeals for the Second Circuit, 2012).
- On 26 January 2016, the Spanish Supreme Court corrected a previous judgment of the Provincial Court of A Coruña in which the *Prestige* captain had been acquitted of environmental crime and had only been condemned for disobedience—which had no civil liability attached. The captain was sentenced to two years in prison for a crime of serious recklessness and the Supreme Court established a clear causal relationship between this and the environmental disaster, which made him civilly liable. This leaves without effect the protection that the 1992 CLC in its article III (4) provided to the pilot and other agents contracted by the owner is lost. The court also stated that the shipowner has subsidiary civil liability and has no right to limit it. It was considered that the owner was knowledgeable about the condition of the ship and acted negligently by allowing its navigation. Also, the insurer of the vessel, the London P&I Club, was found to be directly civilly liable by the Supreme Court up to the maximum amount in its insurance policy (US$ 1 billion). The IOPCF is also involved in the judgment as civilly liable, although the limitation of liability of the 1992 Fund is respected. The total amount of the damage remained to be elucidated until the execution phase of the judgment, but already contemplates compensations not only for objective economic damage—cost of repair and loss of profit—but also for purely environmental and moral damages (Supreme Court of Spain, 2016).

The case of the *Prestige* oil spill revealed the shortcomings of the 1992 CLC/FC regime to provide the appropriate compensations with such a level of liability limitations. This greatly complicates the possibility of recovering the part of the damage that is admissible but above the financial cap—limitations of liability. It also showed the difficulty of the States to hold accountable those who are involved, when it is necessary to prove the fault in such a difficult-to-monitor environment.

In the courts, the Spanish State claimed €1214 million for purely environmental damage (IOPCF, 2016c) since the 1992 conventions do not contemplate this type of damage. The valuation of environmental damage is a recurrent criticism received by the international system and will be discussed in section 5.

4.2. Erika (France), 1999

In 1999, the Erika tanker, registered in Malta, carried about 31,000 tons of fuel oil when it broke in two in the Bay of Biscay about 110 km off the coast of Brittany. The ship discharged about 19,800 tons of fuel oil affecting 400 km of coast.

At the time of the incident, France was part of the 1992 CLC and the 1992 Fund, so the shipowner could limit its liability to SDR 9.2 million—US$18.24 million. The Fund was responsible for the next tranche until SDR 135 million—US$267.64 million.

Claims totaling €388.9 million were submitted and payments amounting to €129.7 million—today's US$188.3 million, approximately—were made for those who were considered eligible under the criteria of the Convention. At the same time, however, legal proceedings were brought before the Criminal Court of First Instance in Paris against a number of the parties involved, finding four of them guilty: the shipowner's representative—Revere Shipping—, the president of the management company—Panship Management and Services—, the classification society—RINA—and the "de facto" charterer (Total, SA). The sentence was ratified in successive appeals by the Court of Appeal and the French Supreme Court. In addition to criminal sanctions, the four actors were convicted jointly and severally to compensate the plaintiffs with €203.8 million. The damage valuation included repair and cleaning expenses and economic losses as well as purely environmental and moral damages.

Consequently, the losses not included in the definition of damage of the international regime had to be resolved in the French national courts during the 15 years following the event. For this, it was necessary to demonstrate the neglect or recklessness of the actors and find the way to circumvent the channeling provision of the CLC (Popp and O'Connor, 2013).

4.3. Hebei Spirit (Republic of Korea), 2007

The incident occurred in December 2007 during a towing process under adverse weather conditions. The tow line broke and the crane struck the ship, piercing three of its tanks. The freighter spilled 10,900 tons of oil. It affected about 375 km of coast in the western part of the peninsula. Only 20% of the spill was collected at sea.

At that time, the Republic of Korea was member of the 1992 CLC and the 1992 FC, but not of the Supplementary Fund. Therefore, the shipowner had the right to limit its liability to SDR 89.77 million and the Fund up to SDR 203 million.

The Hebei Spirit Court of Appeal assessed the losses resulting from the incident and placed them at a total of ₩738 billion—US$0.67 billion—, finding the 50% of the submitted claims admissible (IOPCF, 2016d). As this amount far exceeds the 1992 Fund's compensation limit—SDR 203 million, US$361.15 million—, the Executive Committee currently places the level of payments at 60% (IOPCF, 2016e).

Cho (2010) highlights two limitations inherent in these international conventions that are revealed in the case of the Hebei Spirit. On the one hand, damage valuation, which took into account only the direct losses of the tourism industry, but not those of the support industries which were indirectly affected. Neither were the environmental costs nor the local economic rehabilitation needs admissible costs. On the other hand, it remarks the slowness to make effective the payment of the indemnifications. The Government of the Republic of Korea was forced to issue a special law to cover the remainder of the losses of the affected parties and to advance the compensations which the shipowner' insurance and the Fund had to cover.

4.4. Natuna Sea (Indonesia, Malaysia and Singapur), 2000

The oil tanker *Natuna Sea*, which carried a cargo of 70,000 tons of Nile Blend crude oil, grounded in the Singapore Strait near the coast of Indonesia. It is estimated that it spilled 7,000 tons affecting the coasts of Singapore, Indonesia and Malaysia. According to Singapore Oil Spill Response Center, it was in good condition (Richards, 2001, p. 1).

Singapore was a member of the 1992 CLC and the 1992 FC. However, Indonesia was a member of the 1992 CLC but not of the 1992 FC and Malaysia was only a member of the CLC of 1969 and of the FC of 1971. This meant that the applicable liability limitation to Natuna Sea was SDR 22.4 million—US$40.6 million—under the 1992 CLC and SDR 6.1 million—US$11.1 million—under the 1969 CLC. The claims eligible for compensation did not exceed these amounts and neither the 1971 Fund nor the 1992 Fund had to act. Compensations made by the owner and insurer were £320,000—US$0.7 million—in Malaysia, £1.6 million—US$3.3 million—in Indonesia and £4.7 million—US$9.8 million—in Singapore

(IOPCF, 2004).

4.5. Nakhodka (Japan), 1997

In 1997, the Russian-flagged tank *Nakhodka*, split in two at 100 km offshore from the Oki Islands (Japan), spilling about 6,200 tons of medium fuel oil and polluting the coast of ten prefectures along 1,000 km.

At the time of the incident, Japan was part of the 1992 CLC and 1992 FC, but Russia, where the ship was registered, was only member of the 1969 CLC and 1971 FC. The IOPC Funds considered that the responsibility of the shipowner was limited to the level established by the 1969 CLC, SDR 1.59 million. Additionally, it declared that the 1971 Fund Convention was applicable and was entitled to limit its liability up to SDR 58.41 million and if the amount to be compensated exceeds this figure, the 1992 Fund will be responsible for compensating victims up to SDR 135 million—US$274.8 million.

The total number of eligible claims was closed in 2002 amounting to ¥26.1 billion—US$0.3 billion—(IOPCF, 2003), exceeding the liability limit of the 1992 Fund. The level of payments was established at 80%.

Investigations carried out by the Russian and Japanese authorities concluded that there could have been “fault or privity” by the owner, as the maintenance status of the vessel was poor, presenting “extensive corrosion weakening the internal structure of the ship” (IOPCF, 2002, p. 72). The incident would not have had such an outcome in the face of bad but conventional weather conditions if it had been properly maintained. According to the Article V.2 of 1969 CLC, in this case the owner would not be entitled to limit its liability. The executive committees of the 1992 Fund and the 1971 Fund decided to take legal actions in order to redistribute the burden of compensation and recover part of the amount disbursed. However, in May 2002, an out-of-court settlement was reached whereby the owner of the vessel and its insurer assumed that the owner had no right to limit its liability, with the insurer bearing the 42% of the compensation and the 1971 and 1992 Funds the 58%. In this way, all victims who submitted admissible claims were finally compensated.

4.6. Baltic Carrier (Denmark), 2001

On 29 March 2001, the *Baltic Carrier* collided with a sugar-laden bulk carrier about 55 km offshore from Rostock—Germany—, releasing some 2,500 tons of oil. The spill affected the coasts of some Danish islands and slightly to Germany and Latvia.

The acceptable damage claims were estimated at a total of DKK107—$17.61 million—and the limitation applicable to the *Baltic Carrier* under the 1992 CLC was about SDR 10.66 million—$18.39 million. The Fund, therefore, has not had to face any compensation (IOPCF, 2004).

It is worth noting the deployment of resources and the international collaboration in the response to the spill. The Danish coastguard provided seven of its response ships, Sweden three and Germany two. The cleaning work in the sea ended in three days. Coast clean-up activities—mainly carried out in Denmark— were coordinated by the Danish and Swedish authorities, mobilizing hundreds of people including local security forces, municipal workers, contractors or volunteers. The emergency response phase was terminated in about 10 days and the cleaning work finished in summer (IOPCF, 2003).

4.7. Solar 1 (Philippines), 2006

The tank vessel *Solar 1* sank off the coast of Guimaras Island (The Philippines) during a storm in 2006. It spilled almost all its cargo—approximately 2,100 tons—, affecting hundreds of kilometers of coast (Cumo, 2014, p. 120).

At the time of the incident, the Republic of Philippines was a member of the 1992 CLC and the CF 1992. In addition, the ship was insured by the Shipowners' Mutual Protection and Indemnity Association (Shipowners' Club), so it was part of the STOPIA program, which operated since 2006—see section 3. Under these conventions, the liability limit applicable to the owner was SDR 4.51 million—US$8.15 million—, according to the 1992 CLC, but was extended to SDR 20 million—US$36.14 million—, under the STOPIA. From that amount, the Fund would be responsible for covering the compensations up to SDR 203 million—US$366.9 million—, with accordance to the 1992 FC.

The amount disbursed to July 2016 amounted to ₱986.7 million (IOPCF, 2016f). This amount is around US$20.14 million today, exceeding the liability limit of the CLC—US$8.15 million—for the owner, but below the limit of STOPIA.

During the investigations of the incident serious irregularities were discovered that could have contributed to the outcome of the accident. The captain of the ship was not in possession of the proper certificate to operate a vessel of this nature, and other crew members lacked proper documentation and, supposedly, adequate training. It is suspected that the ship was also overloaded. In addition, it was known that the ship was of considerable age and had been reconverted on several occasions, operating under different names throughout its life. This last fact occurred under the knowledge and consent of the maritime authority (Baleña, 2015; Senate of the Philippines, 2006).

4.8. Volgoneft 139 (Russian Federation and Ukraine), 2007

In 2007, the *Volgoneft 139* tanker split into two in the Kerch Strait, between the Russian Federation and Ukraine. The ship released between 1,200 and 2,000 tons of heavy fuel oil, affecting some 250 km of coastline in both countries.

At the time of the incident, the Russian Federation was a member of the CLC 1992 and the 1992 CF, but Ukraine had not signed any of the conventions. The liability of the shipowner under the 1992 CLC was limited to up to SDR 4.51 million—US$8.19 million. However, it soon became clear that the owner had taken out insurance for only SDR 3 million, which was the limitation of liability prior to the amendment of the year 2003. This meant an “insurance gap” of SDR 1.51 million—US$ 2.74 million.

The amount to be compensated, ₱503.2 million—around $US22 million—, far exceeded the owner's liability limit, and, of course, the insured amount. The Fund assumed its share under the 1992 Fund agreement—i.e. from SDR 4.51 million—resulting in a disbursement of SDR 8.47 million.

Who was responsible for covering the insurance gap was subject of controversy in the Russian courts. In 2008, the owner of the vessel, *JSC Volgotanker*, filed for bankruptcy, so it would not cope with the insurance gap. The insurance company, *Ingosstrakh*, was not willing to cover an amount that was not agreed in the contract. The Fund, on the other hand, considered an unjustifiable burden on its contributors to deal with an amount that was the sole responsibility of the owner under the 1992 CLC. Finally, in November 2014, the Arbitration Court of St Petersburg decided that the 1992 Fund should not take care of the insurance deficit and resolved to deduct this amount from the final quantity of the compensation package. This means that this part of the social cost ended up being borne by third parties not involved in the transaction (IOPCF, 2016g).

In addition, it is worth noting a recurring problem with the international regime, which also occurred in the *Volgoneft 139* case:

the claim for compensation for environmental damage. The environmental damage, as formulated in Article I.6 of the 1992 CLC, cannot be included in the valuation since it must be limited to costs of reasonable measures of reinstatement or prevention.

4.9. Slops (Greece), 2000

The Greek boat *Slops* is a "waste oil reception facility". It was loaded with about 5,000 cubic meters of oily waters—of which between 1,000 and 2,000 cubic meters were supposedly oil—when it suffered an explosion in the Port of Piraeus. Among the consequences of the disaster are the death of an operator, the burning of two other ships nearby and a considerable amount of oil spilled into the sea.

The *Slops* case is well known for its complexity. After several reconversions, the *Slops* went from cargo ship to facility for storage and treatment of oily waste, and it seems it had remained docked in port since then. The key problem is whether the *Slops* falls within the definition of "ship" given in the article I.1 of the 1992 CLC. Because, if the answer is no, the 1992 Fund would not have to be involved in this matter, and this was the position of the Fund's Executive Committee.

The *Slops* was not insured under Article VII.1 of the 1992 CLC and the owner declared himself insolvent. The plaintiffs took legal action against the 1992 Fund to cover the compensation. The Court of First Instance in Piraeus concluded that the *Slops* should be considered a ship and that, since the owner was financially insolvent and had no liability insurance, the 1992 Fund had to cover the compensation. After successive appeals, the case reached the Supreme Court, which upheld the sentence. Finally, the Fund paid about €4 million in compensation, plus interest and legal costs. The Executive Committee devoted a long time to deciding whether taking legal action against the Greek State for not requiring the compulsory insurance, but finally determined not to do so (IOPCF, 2009).

4.10. JS amazing (Nigeria), 2009

The *JS Amazing* incident occurred at a refinery owned by the *Nigerian National Petroleum Corporation* (NNPC) located on the Warri River (Nigeria). The ship was docked improperly with insufficient mooring ropes and the movement drove it to crash into the remains of a sunken mooring dolphin. Two iron pipes pierced into the hull. About 1,000 tons of fuel oil were spilled, causing serious damage within a radius of 7.5 km.

At that time, Nigeria had ratified both the 1992 CLC and the FC and, according to the tonnage of the vessel, the liability limitation of the owner stood at SDR 4.51 million—US$7.94 million—and the Fund's limitation at SDR 203 million—US$357.48 million. Presumably, the amount of estimated costs exceeded the liability limit of the owner, so the fund would have to cover the remaining amount. However, the claims sent to the Fund, based on insufficiently substantiated evidence, and the inability to prove the true source of the pollution led the IOPCF to reject all claims.

The shipowner did not pay his compensation share. Only after pressure from local groups, the *Pipeline and Product Marketing Company*—PPMC, a subsidiary of the NNPC—provided a compensation of ₦30 million—about SDR 130,000—to affected communities.

The Marine Board of Inquiry, established by the Federal Ministry of Transport of Nigeria, found that there was no officer on duty, no first engineer officer, and neither the captain nor the crew were qualified to assume the management of a vessel of this nature. Additionally, it was later known that the vessel was not insured at the time of the incident nor was it classified as a certified transport to operate with the heavy oil it transported (IOPCF, 2015).

The case of *JS Amazing* highlights the difficulty of some nations' authorities to successfully enforce the rules of the international regime. There were basic institutional problems related to the delimitation of property rights and the proper determination of the origin of the spill, the amount of damages and, thus, the subsequent compensation. Besides this, it is worth noting the Nigerian State's inability to react to the disaster, which aggravated the consequences of the spill.

Another illustrative sample of the enforcement problem is the following. NOSDRA requested PPMC to undertake the cleaning and recovery of the affected areas. PPMC ignored the order and was fined ₦1 million. As this fine was not paid, NOSDRA took PPMC to court in 2010. The judge ruled that the PPMC had to proceed to the cleaning and to pay the fine that had been imposed. It is unknown if it was fulfilled.

On the other hand, the Nigerian authorities showed no collaboration with the Fund. The Fund did not know of this incident until May 2010. Neither did they provide the identity of the owner of *JS Amazing*. There are still many details that are unknown.

5. Performance and limitations of the international regime

Specific parts of these conventions have often received substantial criticism. Some features of the regime even prevented the entry of such important countries as the United States. The main criticisms were directed towards the following issues.

5.1. Limitation of liability or financial caps

Traditionally, maritime law has contemplated the right of the shipowner to limit his/her responsibility. The main reasons cited are:

a) It promotes the development of transport activities, which were considered to be high-risk in the past. These activities would have been unrealizable if they had to fully cover the costs of a spill. It is also argued that this made sense in the past in order to allow the development of a competitive national merchant fleet. In turn, according to Faure and Wang (2008), taking into account "the change of the commercial structure and the modern technology, these reasons advanced in the 17th century were not valid anymore".
b) It makes sense to establish a reasonable risk distribution among all those who benefit from the activity. However, this configures a distribution of risk that is as indiscriminate as the place where the disaster occurs.
c) It is necessary to comply with the requirements of insurers. It is understood that unlimited liability would be uninsurable or the costs would be too high.

Gauci (1995) considers that the limitation of liability is an anachronism and concludes that there is no justification for its current existence, because it is an "unjustly discriminatory attempt to subsidize the shipping industry at the expense of other interests". Faure and Wang (2008) agree that those conditions that motivated the financial caps in the first place do not hold anymore and qualify them as a "historical mistake". The latter recall three recurrent criticisms of the limitation of liability:

1) It is a subsidy for the shipping industry, which ends up being borne by other actors—in many occasions the victims themselves.
2) Regarding the justification (c)—about the conditions of the liability insurance—, they argue that "the liability can be unlimited

while the amount of insurance can be restricted to a certain amount"(Faure and Wang, 2008, p. 598).

3) Eliminating the financial caps would increase the incentives to invest in prevention by the shipping industry.

But the limitation of liability applies not only to shipowners but also to the IOPCF under the 1992 CF. Beyond the limit imposed by this financial cap, the principle of strict liability does not operate. Any demand exceeding the cap must be made outside the CLC/FC regime in national courts and needs to demonstrate the culpability of some of the actors involved.

In cases of large spills such as the *Prestige*, the *Hebei Spirit* or the *Nakhodka*, the available compensation did not even cover the admissible costs—in the sense of the convention—originated by the spills. Limitations of liability were too low to adequately compensate for the generated externality. Only in the case of the Nakhodka—and perhaps in the case of the Prestige—was it possible to recover the admissible costs through national court proceedings and extrajudicial agreements.

The US liability and compensation regime, which is essentially constituted by the Oil Pollution Act (OPA) of 1990, imposed higher financial caps from its inception than the International Regime. In addition, the range of assumptions in which a shipowner may lose the right to limit his/her liability is much broader. In fact, as Kim (2003) states, the US regime "provides substantially unlimited liability through easily broken liability limits". Therefore, the US regime is a precedent that serves as a guide for a possible evolution of the international system.

The impact of the 1990 OPA on the incidents in the US has become a subject of significant attention. The number and volume of oil spills in the US have decreased since 1990. Substantial research pointed the enactment of the 1990 OPA as the fundamental cause of this reduction (Homan and Steiner, 2008; Kektar, 2002; Kim, 2002). The institutional framework established by the OPA configured a system of incentives that forced polluters to select a higher level of precaution thereby reducing the likelihood and the scope of the oil spills (Faure and Wang, 2008; Hay, 2006). However, the recent Deepwater Horizon spill has revealed the "most serious shortcomings" (Kiern, 2011) of the OPA. The financial caps in the OPA for the offshore platforms resulted too low to cover the costs of the damage. Nowadays, although it is not common that the damage exceeds the financial caps, we have seen that the potential damage in big catastrophes is much higher than the limitations of liability contained in both the OPA and the Supplementary Fund of the International Regime.

5.2. The channeling of liability to the owner of the ship

The article III.4 (c) of 1992 CLC channels liability to the shipowner, thereby preventing claims within the Convention framework against other actors, such as the charterer, the crew members or the classification society. Again, legal proceedings against them would have to be carried out in parallel under national legal systems and under criteria other than strict liability.

Popp and Oconnor (2013, p.16) distinguished two main reasons why the international regime channels liability to specific actors under a strict liability regime and imposes financial caps:

1) By holding only one party responsible, the shipowner can obtain insurance without the need of another party to ensure the same risk.
2) The victims do not have to wait until the national courts issue their judgments on the claims between the shipowner and the charterer.

Faure and Wang (2006) argue that when the conditions of the Coase theorem do not exist, the channeling of liability becomes inefficient from an economic perspective. If other actors who can intervene in the damage are no longer exposed, the dissuasive effect of being exposed to liability is lost.[5]

This arrangement, when combined with the limitation of liability, makes that sometimes plaintiffs can only direct actions against the owner of the vessel. For instance, in the *Volgoneft 139* case, the insurance gap finally had to be borne by the victims because up to that figure it was the responsibility of the owner and claimers could not make the Fund subsidiary liable. The channeling of liability, which is claimed to have only essentially distributional consequences, may affect the amount available to compensate the victims.

In the *Erika* case, France managed to avoid the channeling of liability and take legal action against other actors. However, to do so, it had to demonstrate the negligence or recklessness of those other actors—cargo owner, classification society, owner's representative, etc.—or their non-attachment to the owner so that they could not be protected by the CLC. Spain is currently attempting by the same means to break the channeling in the courts.

In contrast to the International Regime, in the US OPA 90, the liability is not channeled to the shipowner, but "any person owning, operating or demise chartering the vessel" can be liable. Additionally, it places *strict joint and several* liability.

5.3. Reduced conception of damage and the measurement of the environmental cost

The 1992 CLC defines "pollution damage" as "loss or damage caused outside the ship by contamination resulting from the escape or discharge of oil from the ship, wherever such escape or discharge may occur, provided that compensation for impairment of the environment other than loss of profit from such impairment shall be limited to costs of reasonable measures of reinstatement actually undertaken or to be undertaken" and "the costs of preventive measures, and further loss or damage caused by preventive measures". Therefore, it limits the environmental damage to the amount spent or to be spent to mitigate or prevent the damage.

As seen in the previous section, the plaintiffs often claimed purely environmental costs—*Prestige*, *Erika*, *Hebei Spirit*, *Volgoneft 139*—, what was systematically rejected by the Fund since they failed to define the actual cost of reasonable measures of reinstatement or prevention. These could only be claimed in parallel in national courts and outside the framework of the international regime.

The *Erika* claimants were compensated for purely environmental damage after years of legal proceedings demonstrating the negligence or recklessness of the actors involved. Recent movements in the Spanish Courts about the *Prestige* case could lead to a similar outcome. South Korea, for the *Hebei Spirit* case, and Italy, for the cases—not covered here—of the *Patmos* (1985) and the *Haven* (1991), unsuccessfully demanded compensation for purely environmental damage.

This contrasts again with the 1990 US Oil Pollution Act. Unlike the 1992 international regime, the 1990 OPA "abstract quantification of non-market environmental damage is allowed in accordance with prescribed assessment standards" (Mason, 2003, p. 4). In fact, one of the reasons why United States is not Member State of the international conventions is because of its limited concept of damage (Mason, 2003).

[5] For a deep analysis of the implications of the channeling of liability from a coasean perspective, see Faure and Wang (2006).

The concept of economic damage itself has also been a bone of contention. It does not include the harm to auxiliary industries, which do not receive the damage immediately but indirectly (Cho, 2010; García Negro et al., 2007). These are economic losses caused by the spill that also remain uncompensated under the international conventions.

5.4. A long process and strict admissibility criteria for compensation

The objectives of these conventions included delimiting responsibilities among the actors involved and streamlining the compensation procedures. However, those states that felt they were being under-compensated faced long judicial processes to try to recover those costs that exceeded the financial caps or those not contemplated in the concept of damage by the regime.

Moreover, within the international system there are recurrent complaints about the delay in the compensation. For example, the *Prestige* incident occurred in 2002, but as said above, today there are still €50 million of pending compensations. This led the states of Spain, France and South Korea to issue special laws to cover not only those non-compensable damages but also to advance those indemnities to be materialized.

In addition to the long period to receive a compensation, claims face a strict evaluation system to prove that the damage was actually caused by the spill in question (Kim and Yang, 2014; Mason, 2003). Many of the initial claims are automatically rejected due to this. This implies that the preventive force of the international regime is reduced. As a proposal, Mason (2003, p.8) argues that "monitoring of ship movements, combined with long-distance sourcing of oil types, could collectively facilitate more compensation claims against shipowners".

5.5. Non-monetary sanctions: the potential role of criminal law

In order to encourage prevention, it has also been proposed to introduce non-monetary sanctions, especially based on criminal law (Faure, 2010). Criminal settlement seems to be a way by which nations can establish non-economic sanctions that serve as an additional deterrent. In this way, penal sanctions are added to the incentive structure to reduce pollution. It is especially useful in cases where there is a low probability of detection and a high potential gains from assuming risks. These measures may include jail sentences, confiscation of the instruments involved in the disaster—e.g., the vessel—or making public the identity of the offender and the details of the judgment.

As the international regime does not provide adequate and sufficiently strong incentives to minimize discharges (Faure, 2010), nations have had to develop complementary legal frameworks, even in dubious harmony with the international framework, to alleviate their gaps or vulnerabilities. For instance, following the Erika and Prestige disasters, the European Union began moves towards criminal sanctions in its legislation through Directives 2005/35—finally repealed—and 2009/123 on ship-source pollution and the introduction of non-monetary penalties for infringements. Under these rules, spills will be considered a criminal offense "if committed with intent, recklessly or with serious negligence". It also introduces other responsible parties other than the shipowner: flag states, charterers, classification societies, port states and coastal states.

5.6. Heterogeneity of institutional performance across countries

One of the most important analytical spaces for institutionalists left by this case of the international regime is the different performance of the international conventions across countries due to the different national contexts. National governance revealed itself a transcendental issue for the proper functioning of international institutions. Among the cases presented above, we have seen problems associated with the countries' reduced capacity for monitoring and law enforcement, corruption in public corporations, lack of communication between agencies, weak centralization and coordination in prevention and cleaning, etc.

Table 2 presents the different valuations that these countries achieved in the assessment of the Worldwide Governance Indicators (WGI) provided by the World Bank. They are made of subjective perspectives "on governance of survey respondents and public, private, and NGO sector experts worldwide" (Kaufmann et al., 2011). The table provides the average estimates during the period 1996 and 2009, the period in which the oil spills evaluated in section 4 occurred, and considers four of the WGI: governance effectiveness, regulatory quality, rule of law and control of corruption.[6] The countries' performance is quite homogeneous across indicators since they evaluate different dimensions of the same system of governance. These indicators permit us to know the level of performance in terms of governance obtained across countries and to evaluate whether it matches to what we have observed in the oil spill cases presented in section 4.

It is remarkably clear that those countries with better governance performance functioned better in dealing with the oil spill—monitoring, law enforcement, preventive activities, cleaning operations, assistance to victims, etc. The most capable states in governance terms mobilized sufficient resources and successfully coordinated their activities, even along with neighboring countries, to minimize the impact of the spill and accelerate the clean-up activities. The case of the Baltic Carrier was a successful operation in this regard, involving the emergency bodies of three countries—Denmark, Germany and Sweden—, coordinating a significant amount of human and material resources and finishing the emergency response phase in 10 days and the clean-up operations in a few months.

Besides, these countries were able to take action with agility to assist the victims in their claims before the IOPCF, to advance the admissible compensations that were being slow to materialize—*Hebei Spirit* (Korea, Rep.), *Erika* (France) and *Prestige* (Spain)—or even assumed the compensation of the damage that the shipowner and the Fund were not obliged to cover due to the limitations of liability—*Prestige* (Spain).

The story in the other spills was substantially different. For instance, it is remarkable how weak states have problems to enforce the international law and even their own executive decisions. Nigeria struggled with the PPMC to make it cover the clean-up. It contrasts with the power of the French State to make TOTAL, S.A. to assume all the clean-up costs of the Erika spill.

Having a proper insurance is the responsibility of the shipowner, but the responsibility of monitoring if this requirement is fulfilled corresponds to the Contracting State in which the ship is registered (Article VII.2). Among these 10 cases, there are several

[6] Kaufman et al. (2011) provide the following descriptions for these indicators: *government effectiveness* reflects "perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies"; *regulatory quality* captures "perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development"; *rule of law* refers to "perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence"; and *control of corruption* reflects "perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests".

Table 2
Worldwide Governance Indicators: heterogeneity in governance.

Country	Average 1996–2009			
	Government effectiveness	Regulatory Quality	Rule of Law	Control of Corruption
1. Denmark	2.16	1.80	1.91	2.45
2. France	1.61	1.12	1.40	1.36
3. Spain	1.40	1.24	1.21	1.21
4. Japan	1.29	0.96	1.28	1.17
5. Korea, Rep.	0.90	0.71	0.87	0.40
6. Greece	0.70	0.85	0.81	0.42
7. Philippines	−0.06	−0.02	−0.40	−0.54
8. Indonesia	−0.37	−0.38	−0.72	−0.83
9. Russian Fed.	−0.47	−0.32	−0.92	−0.91
10. Nigeria	−1.00	−0.94	−1.26	−1.12

uninsured—*Slops* (Greece), *JS Amazing* (Nigeria)—or inadequately insured—*Volgoneft 139* (Russia)—ships. Their countries of origin did not properly monitor their vessels to identify irregularities in this regard. Moreover, in the cases of the *Solar 1* (Philippines) and the *JS Amazing* (Nigeria), it was known that the captain and at least part of the crew had neither the certificates nor the qualification required to man their vessels.

6. Institutional change: the evolution of the international regime

The international system of liability and compensation has emerged to globally provide a homogeneous legal substance and thus has necessarily evolved in a centralized way. This process of institutional change can be characterized by several elements. Firstly, it has been incremental. Secondly, it was based on a horizontal and cooperative process. Thirdly, although the process has transformed international institutions to improve the outcome and alleviate tensions, they still present some limitations. However, the heterogeneity of the characteristics among the contracting states often leads to conflicting interests. What rules will ultimately prevail is something that will depend on a number of factors.

As stated above, changes are mainly incremental and major historical disasters served as an engine for the evolution of the international regime. The incidents revealed the shortcomings of the institutional structure and led to the increase of environmental awareness, aversion to this industry and the demand for greater penalties (Faure and Wang, 2008):

- The disaster caused by the sinking of the tanker *Torrey Canyon*—in 1967—led to the creation of several international institutions, including the 1969 and 1971 CLC conventions.
- The *Amoco Cadiz* incident—in 1978—revealed the shortcomings of the international system of that time and led to the 1984 revision. However the reform did not come into force because of the resistance of the United States, which considered it to be too soft.
- The *Exxon Valdez* disaster—in 1989—led the US to refuse to join the international system and to create its own regime, based on the Oil Pollution Act 1990. According to Kim (2003), the international regime and the OPA are quite similar but differ in "the liability limit of a responsible party and the scope of recoverable damages". Among other differences, in the US system, financial caps are higher, the right of limitation of liability is more easily broken, the liability is no channelled to the shipowner and the compensable damage is broader (as seen in subsections 5.1, 5.2 and 5.3).
- The *Erika* incident—in 1999—forced the adoption of the 2,000 amendment to the 1992 CLC/FC Conventions. In this amendment, which came into force in 2003, the limitation of liability was increased. At the same time, movements were initiated within the European Union towards an own regulation that dealt with the damages caused by oil spills with elements not covered by the international regime. This materialized in the legislative packages Erika I, II and III.
- The *Prestige* disaster—in 2002—involved the immediate banning of single-hull tankers near Spain and France right from the time of the incident and accelerated their prohibition throughout the European Union. The EU began to suggest the creation of its own compensation fund (Directorate General for Energy and Transport of the European Commission, 2003) with the consequent split of the international regime. The international reaction was to establish the third level of compensation known as the Supplementary Fund and, in parallel, the TOPIA and STOPIA voluntary agreements were created.

Because of those disasters that showed the shortcomings of the regime, there was an institutional transformation towards a greater protection of the victims. As catastrophes were revealing the deficiencies of the system to compensate the plaintiffs, especially due to the limitation of liability, the financial caps were being revisited and the amounts available to compensate victims were increased, as shown in Table 3.

However, also the conditions under which a shipowner may lose the right to limit his/her liability have been reduced in the revisions. In addition, other agreements have emerged, as we saw in section 3, establishing additional provisions and funds for the actors, to increase the amount available to compensate the victims—Supplementary Fund—and to redistribute the burden among the indemnifiers—TOPIA and STOPIA.

But through what mechanisms did these events evolve the international regime? The following subsections study two sets of conditioning factors for the design and evolution of the international system: geopolitics and culture.

6.1. Geopolitics, conflicting interests and distribution of power

The geopolitical factors are key to explain specific elements of the international institutions or their transformation. The Member States belonging to these Conventions are considerably heterogeneous, with different profiles, needs, interests and bargaining power. This was evident in the conferences prior to the creation of the 1969 agreement: countries engaged in the shipping industry were pushing for low financial caps, and coastal countries tended to demand higher limits (Faure and Wang, 2008, p. 604).

The institutional transformations above are explained in part by changes in the balance of power. Changes in power distribution lead to efforts to restructure contracts, both political and economic

Table 3
Limitation of Liability for shipowners and the Fund in the International Regime.

	1969 CLC/1971 FC		1992 CLC/FC		Supplementary Fund	STOPIA	TOPIA
	Before 1976	After 1976	before 2000 amendment (into force 2003)	after 2000 amendment	(Entry into force 2005)	(Entry into force 2006)	
	Shipowner						
≤5,000 GT	2,000 francs per ton[a]	SDR 133 per ton	SDR 3 million	SDR 4.51 million			
> 5,000 GT			SDR 3 million + SDR 420 per additional ton	SDR 4.51 million + SDR 631 per additional ton			
Maximum	210 million francs	SDR 14 million	SDR 59.7 million	SDR 89.77 million			
	The London P&I Club						
						SDR 20 million	50% of the Fund compensation
	IOPC Funds						
1971	450 million francs (SDR 30 million)	SDR 60 million					
1992			SDR 135 million	SDR 203 million			
Supplementary Fund					SDR 750 million		

Note: GT: Gross Tonnage.
[a] Amended by the 1976 Protocol: the "franc" was replaced as unit of account by the Special Drawing Right (SDR) of the International Monetary Fund.

(North, 1990). For example, new national initiatives emerged to promote the tightening of liability, the increase of compensations or the inclusion of environmental costs. Countries like South Korea or Japan, which are highly importing and therefore major contributors to the IOPC Fund, are resisting this. This highlights the delicate geopolitical balance on which the international regime rests (IOPCF, 2004, p. 5), and it has been necessary to make concessions so that it does not break.

Following the *Erika* incident, the conventions were harshly criticized in France by ministers, politicians and other opinion leaders for their "unacceptably low" limitation of liability, the slowness with which compensation was made and the excessive difficulty in demonstrating the loss (IOPCF, 2001, p. 113). Following this and the *Prestige* incident, the EU issued the Erika I, II and III legislative packages, defended the use of criminal law as an important tool to combat oil pollution (Faure, 2010, p. 162) and threatened with the establishment of a European fund. This led to an increase in the limitations of liability and the creation of the Supplementary Fund (Mason, 2003, pp. 9–10).

Faure and Wang (2008, p.604) explain it as follows: "the more accidents occurred, especially in western Europe and the larger the amount of damage was, the stronger coastal states like France and Spain became in their lobbying within the International Maritime Organization to increase the financial compensation to victims".

6.2. Culture

Cultural issues need to be brought up to explain two issues of fundamental importance for institutional analysis: the initial institutional design and its evolution over time.

Regarding the initial design of the conventions, it is worth noting the importance of previous international arrangements and the similarities of national private law codes, since they allowed the establishment of a common international regime with some ease (Mason, 2003, p. 10). It was constructed on principles and content that previously enjoyed some legitimacy among the contracting states. For example, the existence of the liability limitation in the CLC of 1969 responds more to the path-dependence of this institution's long tradition in maritime legislation than to rent-seeking in the shipping industry (Donovan, 1979; Gauci, 1995; Faure and Wang, 2008). However, despite the fact that it provided ease to build easily a common and legitimated system, this has a counterpart. Because of this path dependence, measures like this one, which are often considered anachronistic and unjustified, are being dragged (Gauci, 1995; Faure and Wang, 2008).

On the other hand, cultural transformation affects the configuration of institutions. In this regard, it is worth noting the impact on the evolution of the international framework of the growing environmental awareness, which demanded increases in the penalties for the environmental risks of treatment and transportation of oil.

7. Discussion and conclusion

According to the International Tanker Owners Pollution Federation (ITOPF), from the 1970s the number and the volume of oil spills from takers have been decreasing "despite an overall increase in oil trading over the period" (ITOPF, 2017). This improvement is due to a joint effect produced by technological progress—navigation systems, shipbuilding, security, etc.—and the evolution of the institutional regimes, which through regulations at national and international levels have promoted safer behaviors and equipment.[7] The 1992 CLC/FC regime is part of this wider institutional framework. It set up an incentive system that penalizes the spill under strict liability, increased financial caps during the last decades, placed the breakability of the right to limit liability, etc. From many perspectives the international regime has been a success, but there is still much room for improvement.

The article highlighted the heterogeneity that exists in terms of performance in the application of these international conventions. It made clear—in subsection 5.6—how countries with good governance were able to mobilize resources and coordinate activities to prevent, minimize and repair the consequences of discharges, ensure timely and adequate compensation for the victims, identify and hold accountable those responsible for the spill and

[7] For works that investigate or defend the impact of maritime institutional frameworks (including liability systems) on the decrease of oil spills at sea, see Kektar (2002), Kim (2002), Burgherr (2007), Homan and Steiner (2008) or Faure and Wang (2008).

find the judicial or extrajudicial mechanisms for financing the compensations. However, countries with poor governance showed problems to enforce the law, properly monitor vessels, assist victims and prevent or minimize the spill consequences.

Through the ten major oil spills within the 1992 CLC/FC system, we have dealt with a number of problems frequently highlighted in the literature, such as the channeling of liability, the extent of the financial caps, the conception of damage, the heterogeneous functioning across countries, the strict admissibility criteria for compensation and the excessively long process to obtain it. Some of these issues are solved or alleviated in the US system, based on the 1990 OPA, and we have asked ourselves why the international system does not incorporate the features contained in it. This led us to reflect about institutional change and to recall some developments of the institutionalist framework to address this issue.

For an institutional system to be sustainable over time, it is necessary that those actors who support it feel benefited by it (North et al., 2009). When this is not the case, the negatively affected actors no longer have rational incentives to sustain this framework. An overview of conflicting national interests showed us the weak equilibrium on which the international institutional regime rests. While some European countries—e.g. France, Spain or Germany—push for higher limitations of liability and greater penalties, high importing countries—such as South Korea or Japan—pull in the other direction. The autonomously-developed framework of the United States and the recent directives of the European Union threaten the international regime with an eventual fragmentation. From the discussion, some proposals have emanated that could contribute to the survival of the international system: increase of the financial caps—subsection 5.1—, subsidiary liability instead of channeling of liability—subsection 5.2—, usage of non-monetary sanctions like criminal provisions—subsection 5.5—, a collective system for monitoring—subsection 5.6—, the broadening of the concept of damage—subsection 5.3—, the simplification or assistance in the formulation of claims and demonstration of fault—subsection 5.4—, etc.

Institutional transformations in the coming years will be transcendental to resolve or alleviate the existing tensions, ensure the survival of the international system and allow the possible entry of countries like the United States and China, which had hitherto remained on the sidelines. In this paper, institutional analytical tools have helped us to construct a fairly eloquent explanation of the formation and transformation of the international system, the deficiencies that challenge its survival and the possible solutions.

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