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Marcela Braga Anselmi

Conflictive climate governance architecture: an analysis of the climate negotiations under the international civil aviation organization (ICAO)

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MARCELA BRAGA ANSELMINI

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Orientadora: Profa. Dra. Ana Flávia Granja e Barros

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Banca Examinadora:

Profa. Dra. Ana Flávia Granja e Barros
Instituto de Relações Internacionais, Universidade de Brasília
Orientadora

Prof. Dr. Antônio Carlos Moraes Lessa
Instituto de Relações Internacionais, Universidade de Brasília
Examinador Interno

Prof. Dr. Paulo Burnier da Silveira
Faculdade de Direito, Universidade de Brasília
Examinador Externo

Prof. Dra. Cristina Inoue
Instituto de Relações Internacionais, Universidade de Brasília
Suplente

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*For the women in my life – the living ones and in memoriam –
who taught me about love, respect and empowerment.*

For Alexandre, for standing by me.

ABSTRACT

The international air transport is a great contributor for the Anthropogenic climate change. Some studies estimate that between 2% to 3% of the global CO₂ emissions stem from the aviation sector, and these figures can almost double in the mid-term, if no mitigations actions are taken to curb emissions. The international climate regime, grounded on the United Nations Framework on Climate Change Convention (UNFCCC) and the Kyoto Protocol, has transferred the negotiation mandate to address CO₂ emissions from the aviation sector to the International Civil Aviation Organization (ICAO). It is claimed that the explicit mandate provided by the Kyoto Protocol triggered an institutional interaction between the UNFCCC and ICAO that has ultimately led to a conflictive climate governance architecture. Although membership of states is overlapping, and both ICAO and UNFCCC are under the umbrella of the United Nations system, their mandates are guided by different principles. While the UNFCCC is based on the principles of *Common but Differentiated Responsibilities*, ICAO is a technical organization guided by the principle of non-discrimination, in which non-state actors (i.e. industry) have an active voice. The Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) is the ultimate response from the aviation sector to the international climate regime, intended to be a cost-efficient measure that diminishes the economic burden to the industry. Transferring discussions to another forum, where market concerns from the aviation sector were more preeminent, helped to consolidate the logic of the liberal environmentalism under ICAO. Therefore, the main objective of this dissertation is to analyze the development of the negotiation process that took place under ICAO, regarding measures and policies aimed at reducing the CO₂ emissions from the international air transport. To support this research, primary sources of documents produced by ICAO, such as resolutions and declarations, as well as position papers presented by state and non-state actors were the basis for the analysis. A literature review on international cooperation, multilateralism, global governance and international organizations was also developed.

Keywords: conflictive climate governance, institutional interaction, liberal environmentalism, ICAO, CORSIA.

RESUMO

O transporte aéreo internacional contribui fortemente para as mudanças climáticas antropogênicas. Estudos estimam que entre 2% e 3% das emissões globais de CO₂ provêm da aviação, com projeções de quase dobrar este número no médio prazo, se ações de mitigação não forem adotadas. O regime internacional de mudanças climáticas, alicerçado na Convenção-Quadro das Nações Unidas sobre Mudanças Climáticas e no Protocolo de Quioto (CQNUMC), transferiu o mandato negociador de um acordo para reduzir as emissões da aviação para a Organização de Aviação Civil Internacional (OACI). Argumenta-se que o mandato explícito provido pelo Protocolo de Quioto desencadeou uma interação institucional entre a CQNUMC e a OACI que gerou uma arquitetura de governança climática conflitiva. Embora os membros sejam os mesmos, e tanto a OACI quanto a CQNUMC façam parte do sistema das Nações Unidas, os mandatos são guiados por princípios distintos. Enquanto a CQNUMC está baseada no princípio das *Reponsabilidades Comuns porém Diferenciadas*, a OACI é uma organização guiada pelo princípio da não-discriminação, na qual atores não-estatais (i.e. indústria) têm voz ativa. O Mecanismo de Compensação e Redução de Carbono para a Aviação Internacional (CORSIA, da sigla em inglês) é a resposta do setor para o regime internacional de mudanças climáticas, constituindo-se como uma medida custo-eficiente que visa diminuir o custo econômico para a indústria. Dessa maneira, a transferência das discussões para outro fórum, no qual as preocupações de mercado do setor são um fator preponderante, contribuiu para consolidar a lógica do ambientalismo liberal na OACI. Portanto, o principal objetivo desta dissertação é analisar o desenvolvimento do processo negociador na OACI no que se refere às medidas e às políticas voltadas à redução das emissões de CO₂ do transporte aéreo internacional. Foram analisadas fontes primárias de documentos produzidos pela OACI, como resoluções e declarações, assim como documentos de posicionamento de países e atores não estatais. Uma revisão bibliográfica sobre cooperação internacional, multilateralismo, governança global e organizações internacionais também foi desenvolvida.

Palavras-chave: governança climática conflitiva, interação institucional, ambientalismo liberal, CORSIA, OACI.

RESUMO EXPANDIDO

As operações aéreas são intrinsecamente globais e interconectadas por sua própria natureza, especialmente quando se considera que a maioria dos voos ocorre no espaço aéreo internacional, onde não prevalece a soberania de nenhum Estado. Dadas as suas características, o transporte aéreo implicou, desde o seu início, o estabelecimento de mecanismos de cooperação entre os Estados visando à fixação de padrões e práticas harmonizadas de navegação aérea e procedimentos aeronáuticos.

A fim de alcançar esses objetivos e promover o desenvolvimento econômico do setor de aviação de maneira ordenada e segura, a Organização da Aviação Civil Internacional (OACI) foi criada em 1944, pela Convenção de Chicago. A principal responsabilidade da ICAO é promover a adoção abrangente dos mais altos padrões em questões relacionadas à segurança, segurança, facilitação e desenvolvimento econômico da aviação civil internacional. Apesar de seus amplos benefícios sociais e econômicos, a atividade de aviação também é uma fonte significativa de impacto ambiental negativo.

O setor contribui para algo entre 2% a 3% do total de emissões humanas de CO₂, segundo dados do Painel Intergovernamental de Mudanças Climáticas (IPCC) e cerca de 13% das emissões de CO₂ de todas as fontes de transporte. Ainda segundo o IPCC, a contribuição do transporte aéreo para as emissões globais de CO₂ poderia aumentar até 5 % até 2050, quando comparada à linha de base de 1990, se nenhuma ação mitigadora for tomada pelo setor. Apesar desses números, as preocupações sobre como reduzir as emissões de CO₂ do transporte aéreo só foram inseridas na agenda da OACI em 1992 e, principalmente, como uma resposta ao regime climático internacional.

Em termos gerais, os anos 1990 são um ponto de virada no reconhecimento da comunidade internacional sobre a necessidade de adotar um compromisso efetivo para conter o aquecimento global antropogênico. Estudos feitos pelo IPCC e pelo Relatório da Comissão Brundtland deixaram claro que o modelo de desenvolvimento econômico adotado até agora poderia implicar consequências catastróficas para o meio ambiente. Não surpreendentemente, a Conferência das Nações Unidas sobre Meio Ambiente e Desenvolvimento, realizada em 1992, consagrou o conceito de desenvolvimento sustentável e estabeleceu a estrutura normativa para a agenda ambiental para as décadas seguintes. Como resultado, o principal compromisso assinado foi a Convenção-Quadro das Nações Unidas sobre Mudanças Climáticas (UNFCCC), um

tratado multilateral muito amplo que visa a estabelecer as condições para alcançar a estabilização da temperatura global. No entanto, não foram estabelecidas quaisquer metas ou compromissos mensuráveis para qualquer país específico, um esforço que só seria abordado cinco anos depois pelo Protocolo de Quioto.

Se a UNFCCC fosse ampla o suficiente para não mencionar setores específicos como o transporte internacional, o Artigo 2 (2) do Protocolo de Quioto preencheu essa lacuna estipulando que os países do Anexo I deveriam procurar limitar ou reduzir as emissões de gases de efeito estufa (GEE) controlado pelo Protocolo de Montreal para o uso de combustível pesados. Mais do que determinar que o transporte internacional também deve contribuir para os esforços globais de mitigação, o Protocolo de Quioto transferiu a negociação de um acordo para as duas organizações setoriais - OACI e a Organização Marítima Internacional (IMO).

Autores argumentam que o Protocolo de Quioto desencadeou a interação da instituição entre a UNFCCC e a OACI. Apesar deste comando explícito dado pelo regime climático internacional, pouco progresso foi feito na OACI nos anos seguintes. A falta de conhecimento sobre o impacto real do transporte aéreo combinado com as dificuldades em atribuir a Estados específicos quanto CO₂ foi emitido por eles criou um impasse no âmbito da OACI. Nessa primeira fase, só foi possível chegar a um acordo sobre declarações mais amplas e objetivos genéricos, principalmente relacionados ao uso de tecnologias aeronáuticas mais eficientes e melhorias nas operações, conforme declarado nas Resoluções da Assembleia da OACI de 1992 a 2007.

Parte da explicação para essa inação pode estar no fato de que a ICAO é uma organização internacional que lida com questões eminentemente técnicas nas quais a disposição para o compromisso é frequentemente menos difícil, uma vez que é mais fácil identificar e articular consenso. De fato, no transporte aéreo, a padronização e a harmonização de regras de procedimentos é uma meta compartilhada, pois reduz os custos de transação e melhora a eficiência. Questões técnicas são consideradas na literatura liberal de Relações Internacionais (IR) sobre cooperação internacional como “problemas de coordenação”. Quando se trata de uma agenda ambiental muito sensível, onde não raramente existe um *trade-off* entre a integridade ambiental e a eficiência econômica, podem surgir posições divergentes entre os Estados. No caso específico da OACI, há algumas evidências de que a indústria também desempenhou um papel importante em forçar a Organização a um impasse, dando o tom do debate.

Argumenta-se, no entanto, que o mandato de Quioto provocou uma interação institucional entre a UNFCCC e a OACI, que resultou em uma arquitetura conflituosa de governança climática. O conflito foi derivado do choque entre os dois principais princípios orientadores dessas duas instituições. Por um lado, o princípio básico no regime climático internacional sob a UNFCCC é o princípio das Responsabilidades Comuns Porém Diferenciadas (CBDR). Por

outro lado, sob a OACI, a prevalece os princípios da não discriminação e da igualdade e justiça, que estão consagrados na Convenção de Chicago.

O princípio da CBDR é central para o regime climático internacional, embora existam diferentes interpretações sobre seu real significado e abrangência. Por este princípio, os Estados desenvolvidos reconheceram as diferenças de responsabilidade para o estágio atual do aquecimento da temperatura da Terra, uma vez que começaram seu processo de industrialização muito mais cedo do que os países em desenvolvimento. Mais do que reconhecer as obrigações diferenciadas dos Estados desenvolvidos, o princípio tornou-se central para a demanda por transferência de tecnologia, mitigação de recursos e ações de adaptação para Estados em desenvolvimento e menos desenvolvidos.

Nada é mais justo e lógico, portanto, do que as obrigações também sejam diferenciadas e proporcionais às emissões históricas de cada país. No entanto, levou anos para ter esse consenso resolvido. No contexto das negociações sobre a agenda climática internacional, este princípio está consolidado e foi a base das negociações para o Acordo de Paris. Quando esta lógica de negociação do regime internacional é transposta no âmbito da OACI, no entanto, surgiu um conflito significativo entre princípios. Nos termos da Convenção de Chicago, os Estados têm a obrigação de garantir que todos os seus operadores aéreos cumpram as normas internacionais, independentemente de sua nacionalidade. Quando começaram as discussões da OACI sobre o estabelecimento de medidas para reduzir as emissões de CO₂, partiu-se do pressuposto de que qualquer obrigação deveria basear-se no princípio básico desta Organização e, assim, quaisquer medidas deveriam ser aplicadas a todos os operadores aéreos indiscriminadamente.

Em uma agenda altamente sensível que pode ter impacto sobre o crescimento econômico do setor, os resultados efetivos da cooperação não foram alcançados com facilidade. Diferentes agendas e interesses prevalecem no âmbito da OACI e, como consequência, a clivagem tradicional entre países desenvolvidos e em desenvolvimento não é tão útil para a análise. Na OACI, os interesses da indústria são muito fortes e a Organização é guiada por preocupações de mercado. De acordo com as projeções da Associação Internacional de Transporte Aéreo - IATA, o setor de transporte aéreo aumentará em um ritmo muito rápido nos próximos 20 anos, impulsionado principalmente pelo crescimento dos mercados emergentes da Ásia (China e Índia) e Oriente Médio (ou seja, Qatar, Arábia Saudita e Emirados). Mercados tradicionais, como os norte-americanos e europeus, provavelmente serão deixados para trás. Nesse sentido, sob a OACI, outra lógica predomina entre mercados maduros e não maduros, o que teve um impacto significativo no processo de negociação climática.

Por um lado, os países em desenvolvimento, cujo mercado de transporte aéreo ainda está amadurecendo e terão altas taxas de crescimento no médio prazo, tentaram transferir a

dinâmica de negociação da UNFCCC para a OACI. Para eles, alguma diferenciação nas obrigações era necessária, pois as companhias aéreas dos países desenvolvidos estão mais consolidadas no mercado e, assim, contribuíram para as emissões globais por um período mais longo. Além disso, a OACI não poderia impor um ônus econômico ao direito desses países de desenvolver sua própria indústria.

Os países desenvolvidos, por outro lado, assumiram uma postura mais protecionista. Precisamente porque suas companhias aéreas estão mais maduras e crescerão em um ritmo muito mais lento nos próximos 20 anos, elas não estavam dispostas a chegar a um acordo que excluísse as obrigações dos países em desenvolvimento. Portanto, esses países defenderam fortemente que o princípio de não discriminação fosse levado plenamente em conta em qualquer acordo sob a OACI.

A esse respeito, a possibilidade de que a OACI pudesse perder sua prerrogativa de negociar um acordo climático, e o setor de aviação pudesse fazer parte de uma resposta muito mais abrangente, também gerou um papel mais incisivo e ativo da OACI. Além disso, outros dois fatores foram decisivos para o avanço da OACI nessa agenda: (i) a possibilidade de uma fragmentação de respostas regionais para reduzir as emissões do setor de aviação; (ii) a ação inicial da indústria, que voluntariamente adotou metas ambientais mais ambiciosas.

Depois de a União Europeia ameaçar incluir o setor de aviação em seu Esquema de Comércio de Emissões (*EU ETS*), tanto a OACI quanto a indústria rejeitaram esse tipo de ação unilateral. Em última análise, a posição europeia pode ter sido decisiva para levar o setor a um acordo. De fato, a resposta da OACI ao regime climático é subsidiária da postura do setor sobre o assunto. Não obstante, os objetivos e compromissos aspiracionais alcançados sob a OACI estavam longe de ser ambiciosos, especialmente quando comparados aos objetivos propostos pela própria indústria.

Dez anos após o mandato conferido por Quioto, a OACI não havia alcançado qualquer progresso no sentido de alcançar um compromisso. Como resposta à inação da OACI, em 2007, a Conferência das Partes (COP), sob o regime UNFCCC, estabeleceu o *Bali Roadmap*, um plano de ação detalhado que criou as condições para a negociação de um novo acordo vinculante para substituir o Protocolo de Quioto. As perspectivas de que o regime climático internacional pudesse assumir o papel da OACI resultaram em alguns progressos, ainda que pouco ambiciosos. Em 2010, a OACI avançou na direção de acordar metas ambiciosas para melhorar a eficiência do combustível em 2% ao ano e alcançar um crescimento neutro em carbono a partir de 2020.

Para atingir esses objetivos, os Estados-membros da OACI concordaram com a implementação de uma cesta de medidas que incluía melhorias tecnológicas e operacionais, o uso

extensivo de combustíveis alternativos sustentáveis e, temporariamente, medidas baseadas no mercado. O Esquema de Compensação e Redução de Carbono para a Aviação Internacional (CORSIA) foi desenvolvido em uma estreita colaboração entre a OACI e a indústria, como uma tentativa de conciliar os princípios de não-discriminação e o CBDR. Além disso, constitui o principal mecanismo que permitirá ao setor da aviação atingir, a curto prazo, o objetivo ambicioso de crescimento neutro em carbono, enquanto as outras medidas precisam de algum tempo para amadurecer.

O CORSIA é uma medida simples baseada no mercado, por meio da qual todas as emissões de CO₂ acima de uma linha de base acordada precisarão ser compensadas pela compra de unidades de carbono. Pretende-se ser uma medida eficiente em termos de custos, na qual o preço do carbono é determinado pelas forças do mercado. Nesse sentido, a indústria da aviação pode transferir o ônus de diminuir suas emissões para setores onde é mais barato. A adoção da CORSIA foi altamente apoiada pela indústria, principalmente pela IATA, como um meio de evitar uma fragmentação de diferentes negociações regionais e nacionais que poderiam aumentar os custos transacionais. Nesse sentido, o CORSIA foi projetado para ser o único e global esquema de MBM para a aviação internacional. Não é um mecanismo perfeito e certamente não será suficiente para conter o aumento antropogênico total das concentrações de GEE na alta atmosfera. No entanto, é um passo importante para um caminho mais sustentável para o desenvolvimento do transporte aéreo internacional. Talvez em nenhum outro setor tenha sido alcançado um acordo com um comprometimento tão forte dos atores que serão, de fato, responsáveis por sua implementação - a indústria.

Nesse contexto, o principal objetivo desta dissertação é analisar o desenvolvimento do processo de negociação que ocorreu no âmbito da OACI com relação a medidas e políticas que visam a reduzir as emissões de GEE do setor de transporte aéreo internacional. Busca-se responder ao seguinte problema de pesquisa: por que a arquitetura de governança climática sob a OACI foi altamente conflitiva em termos de seus principais princípios norteadores? Os principais atores estatais e não estatais envolvidos, os aspectos e princípios que nortearam as negociações que resultaram na adoção do CORSIA, bem como o papel desempenhado pela OACI como um ator independente, com uma forte burocracia, constituem a base na análise.

O Protocolo de Quioto foi o mecanismo desencadeador de uma interação entre a UNFCCC e a OACI, que gerou uma arquitetura conflitiva de governança climática sob a OACI. Embora a participação em atores tradicionais seja coincidente - todos os 192 Estados membros da OACI também fazem parte da UNFCCC - e ambas as instituições estão sob a égide do sistema das Nações Unidas, elas cumprem mandatos muito diferentes e operam sob diferentes

princípios orientadores. Embora a OACI seja uma organização técnica criada para resolver problemas de coordenação, a UNFCCC é o resultado de um difícil consenso entre os Estados sobre como cooperar para resolver um problema maligno. Portanto, os diferentes interesses, dinâmicas e princípios que envolvem essas duas instituições ajudam a explicar por que um acordo era difícil de alcançar. Os princípios do CBDR e da não-discriminação não foram facilmente conciliados, pois os países-membros da OACI usaram cada um desses princípios como um símbolo para representar os interesses de suas indústrias e proteger seu próprio mercado de aviação, criando, como consequência, essa arquitetura conflitiva.

A primeira hipótese principal desta pesquisa provou estar certa. Pode-se argumentar, de fato, que a OACI é uma organização internacional autônoma com autoridade e legitimidade para padronizar normas e padrões técnicos para o setor, com base nos princípios de não-discriminação e igualdade de tratamento. Quando chamada, no entanto, para atuar em questões ambientais, não esteve tão propensa a internalizar os princípios da UNFCCC. Como resultado, um conflito manifesto de princípios emergiu da interação institucional entre a OACI e a UNFCCC, resultando no reconhecimento da OACI como o fórum principal para discutir qualquer medida a ser tomada pelo setor de aviação.

Quando a UNFCCC tentou assumir o mandato dado à OACI por Quioto, a OACI conseguiu assegurar seu papel e evitar maior interferência do regime climático internacional. Nesse caso, o poder institucional exercido pela OACI, que adquiriu grande autonomia na agenda ambiental além de seu mandato original, foi decisivo para o resultado final. Como a OACI é impulsionada principalmente por preocupações de mercado, os atores estatais e não-estatais foram capazes de estabelecer novos prazos para o processo de negociação, no sentido de que as discussões levaram mais tempo para acontecer na OACI. Além disso, uma opção de “forum shopping” ocorreu quando as negociações na UNFCCC foram transferidas para a OACI, adicionando novas dinâmicas e interesses, e resultando em uma maior influência da indústria no resultado final. A transferência de discussões para outro fórum, onde as preocupações de mercado do setor de aviação eram mais preeminentes, ajudou a consolidar a lógica do ambientalismo liberal sob a OACI.

Nesse sentido, um acordo foi possível sob a OACI porque foi alcançado um comprometimento em relação a um regulamento sobre emissões que era a alternativa mais econômica, reduzindo o ônus econômico para a indústria. A indústria do transporte aéreo foi um ator-chave na OACI para a adoção da medida mais eficiente em termos de custo. Mais do que isso, a IATA foi um defensor de que qualquer medida deveria ser multilateral e global em seu escopo como um meio de evitar a fragmentação do marco regulatório. Como resultado, esta pesquisa tentou

demonstrar que havia uma correlação entre as preocupações da indústria sobre a competitividade econômica e a eficiência de custo, por um lado, e os elementos finais constitutivos do CORSIA, por outro lado.

O CORSIA é a tentativa final de conciliar os princípios orientadores da UNFCCC e da ICAO. Nos seus principais elementos constitutivos, o CBDR e o princípio de não discriminação foram inseridos. No entanto, quando totalmente implementado, o CORSIA provavelmente acarretará algumas distorções significativas no mercado que colocarão a maior parte dos custos nos mercados emergentes e de rápido crescimento. Como foi projetado, o CORSIA funcionará como um mecanismo que aloca os direitos de emissões aos países e suas companhias aéreas de acordo com sua participação no mercado. Como resultado, as companhias aéreas mais consolidadas receberão uma parcela maior dos direitos de emissão, enquanto as companhias aéreas não maduras, que provavelmente crescerão em um ritmo maior, terão que compensar mais suas emissões, já que elas têm poucos direitos de emissão.

Por fim, o CORSIA pode oferecer algumas evidências de como a estreita colaboração entre Estados e os atores privados é um meio importante para alcançar compromissos mais eficazes. O nível de ambição no regime climático não pode ser desconectado da possibilidade real e da viabilidade técnica de atores privados em responder às metas que são estabelecidas. Para ser eficaz, a transição para um modelo econômico mais sustentável precisará também de compromisso e engajamento total dos atores não-estatais. Afinal, os atores privados são os que têm os recursos para investir em novas tecnologias e a capacidade de encontrar soluções para mudar seus padrões de produção. Nesse sentido, o CORSIA pode não ser apenas o consenso do ambientalismo liberal, mas também uma tentativa de privatização efetiva da regulação ambiental.

List of Figures and Tables

List of Figures

Figure 2.1. 10 Largest domestic market for air transport in 2017 (in million passenger)

Figure 2.2. Share of the global traffic by region in 2016

Figure 2.3. Projected annual growth of total passenger and freight by region up to 2032.

Figure 2.4. Representation in ICAO Group II from 1992 to 2016

Figure 2.5. Representation in ICAO Group III from 1992 to 2016

Figure 2.6. Representation in the ICAO Council between 1992 and 2016 according to Group I, II and III

Figure 2.7. Share of emissions from different sectors

Figure 2.8. Total passenger traffic: history and forecast

Figure 2.9. Absolute and relative crediting of CERs in the first commitment period of the Kyoto Protocol

List of Tables

Table 2.1. Configuration of the ICAO Council from 1956 to 2019

Table 2.2. International Total Revenue Ton Kilometer (RTK) in 2017

Table 2.3. Largest air carriers by passengers in June 2018

Table 2.4. Options from allocating GHG emissions from bunker fuels

List of Acronyms

AEF – Aviation Environmental Federation
CAEP – Committee on Aviation Environmental Protection
CBDR – Common but Differentiated Responsibilities
CDM – Clean Development Mechanism
CER – Certified Emission Reduction
CH₄ – Methane
CO – Carbon Monoxide
CO₂ – Carbon Dioxide
COP – Conference of the Parties to the UNFCCC
CORSIA – Carbon Offsetting and Reduction Scheme for International Aviation
EAG – Environmental Advisory Group
EDF – Environmental Defense Fund
EC – European Community
ECAC – European Conference on Civil Aviation
ETS – Emission Trading Scheme
EU – European Union
EU ETS – European Emissions Trading Scheme
HLM – High-Level Meeting
IATA – International Air Transport Association
ICAO – International Civil Aviation Organization
ICCT – International Council for Clean Transportation
ICSA – International Coalition for Sustainable Aviation
IMO – International Maritime Organization
IPCC – Intergovernmental Panel on Climate Change
IR – International Relations
GHG – Greenhouse gases
GIACC – Group on International Aviation and Climate Change
KP – Kyoto Protocol
LDC – Least Developed Countries
LLDC – Landlocked Developing Countries
MBM – Market-based measure
MRV – Monitoring, reporting and verification
NATO – North-Atlantic Treaty Organization

NGO – Non-governmental organization
NO_x – Nitrogenic oxides
NvPM – Non-volatile particulate matter
O₃ – Ozone
RPK – Revenue Passenger-Kilometer
RTK – Revenue Tonne-Kilometer
SARP – Standard and Recommended Practice
SBSTA – Subsidiary Body on Scientific and Technical Advice
SDM – Sustainable Development Mechanism
SIDS – Small Island Developing States
T&A – Transport and Environment
UN – United Nations
UNFCCC – United Nations Framework Convention on Climate Change
UHC – Unburned hydrocarbons
WWF – Worldwide Fund for Nature

Table of contents

1. INTRODUCTION.....	19
2. GLOBAL CLIMATE GOVERNANCE ARCHITECTURE BETWEEN THE INTERNATIONAL CLIMATE REGIME AND ICAO – A THEORETICAL FRAMEWORK FOR ANALYSIS.....	29
2.1. FROM THE MAINSTREAM RATIONALISTIC APPROACHES OF INTERNATIONAL RELATIONS TO THE CONCEPT OF GLOBAL GOVERNANCE.....	30
2.2. GLOBAL ENVIRONMENTAL GOVERNANCE.....	38
2.3. CONFLICTIVE CLIMATE GOVERNANCE IN A FRAGMENTED ARCHITECTURE.....	44
2.4. LIBERAL ENVIRONMENTALISM AS AN OVERARCHING PRINCIPLE.....	46
3. THE POWER OF RULES OR THE RULE OF POWER IN THE INTERNATIONAL CIVIL AVIATION ORGANIZATION?	50
3.1. THE CONCEPT OF ASYMMETRIC MULTILATERALISM AND THE THEORY OF INTERNATIONAL ORGANIZATIONS AS BUREAUCRACIES.....	50
3.2. ICAO AS AN INTERNATIONAL BUREAUCRACY.....	54
3.2.1. ICAO’s structure and the principle of non-discrimination	54
3.2.2. The configuration of forces within ICAO.....	59
3.2.3. Non-state actors under ICAO.....	68
3.3. THE INTERNATIONAL CIVIL AVIATION CONTRIBUTION FOR CLIMATE CHANGE DAMAGES.....	72
3.4. SETTING THE PRICE ON CARBON – ECONOMIC REGULATION AS AN ALTERNATIVE TO INCENTIVIZE A CARBON NEUTRAL GROWTH SECTOR.....	77
4. REDEFINING GLOBAL CLIMATE GOVERNANCE IN ICAO – THE PATH TOWARDS A MULTILATERAL AGREEMENT TO CURB SECTORIAL GREENHOUSE GAS EMISSIONS FROM INTERNATIONAL AVIATION.....	82
4.1. THE CHOICE BETWEEN A FRAGMENTED OR A GLOBAL AND CENTRALIZED RESPONSE FROM THE SECTOR FOR THE INTERNATIONAL CLIMATE REGIME.....	84
4.1.1. The inception of the climate change discussions on the ICAO’s agenda.....	84
4.2. CONFRONTATION AND RECONCILIATION BETWEEN THE CBDR AND THE NON-DISCRIMINATION PRINCIPLES UNDER ICAO – THE CORSIA RESPONSE.....	106
4.3. THE REVERSION OF THE UNDERSTANDING OF THE CBDR AND THE NON-DISCRIMINATION PRINCIPLES UNDER ICAO.....	110
4.4. CORSIA AS A LIBERAL ENVIRONMENTALISM RESPONSE FROM THE AIR TRANSPORT SECTOR.....	112
5. CONCLUSION.....	114
6. BIBLIOGRAPHY.....	119

1. INTRODUCTION.

“Logo depois, em 23 de outubro, perante a Comissão Científica do Aero Club e de grande multidão, fiz o célebre voo de 250 metros, que confirmou inteiramente a possibilidade de um homem voar.”¹

Santos Dumont

Flying is one of humankind’s great achievements. It has not only allowed a greater integration among peoples, diminishing geographical distances and promoting integration, but it has also become one of the major drivers of welfare, international trade and tourism. In the very recent past, buying an air ticket represented a luxury lifestyle affordable for only a few. Nowadays, traveling by air has become a common activity for most individuals around the globe, even though some still remain marginalized from the overall globalization process in which aviation is inserted.

The air operations are intrinsically global and interconnected by its very nature, especially when one considers that the majority of flights takes place on international air space, where no state sovereignty prevails. Given its characteristics, the air transport has entailed, since its beginning, the establishment of mechanisms for cooperation among states aimed at setting up standards and harmonized practices on air navigation and aeronautical procedures (ICAO, 1944).

In order to accomplish those goals and to foster the economic development of the aviation sector in an orderly and safe manner, the International Civil Aviation Organization (ICAO) was created in 1944, by the Chicago Convention. ICAO’s main responsibility is to promote the comprehensive adoption of the highest standards in matters related to safety, security, facilitation and economic development of the international civil aviation (MACKENZIE, 2010).

Notwithstanding its far-reaching social and economic benefits, the aviation activity is also a significant source of negative environmental impact. The sector contributes to something between 2% to 3% of the total human CO₂ emissions (IPCC, 1999; ICAO, 2016a; ATAG, 2018) and about 13% of the CO₂ emissions from all transportation sources (IPCC, 1999; ICAO, 2016a). According to the Intergovernmental Panel on Climate Change – IPCC’s projections

¹ Santos Dumont’s quotation can be translated into English as: “Right after, on October 23rd, in front of the Aero Club Scientific Commission and of a large audience, I performed the famous 250-meter flight, which entirely confirmed the possibility that men can fly.”

(1999), the contribution from the air transport to the CO₂ global emissions could increase up to 5.0% by 2050, when compared to the 1990 baseline, if no mitigation actions were taken by the sector. Despite those figures, concerns on how to curb CO₂ emissions from the air transport were only inserted on ICAO's agenda in 1992, and mainly as a response to the international climate regime (OBERTHÜR, 2006; ROMERA, 2018).

In general terms, the 1990s are a turning point in the recognition of the international community on the need to adopt an effective commitment to contain anthropogenic global warming. Studies by the IPCC (1990) and the Brundtland Commission Report (UN, 1987) made it clear that the economic development model adopted so far could entail catastrophic consequences for the environment. Not surprisingly, the United Nations Conference on Environment and Development, held in 1992, enshrined the concept of sustainable development and set the normative framework for the environmental agenda for the following decades. As a result, the main commitment signed was the United Nations Framework Convention on Climate Change (UNFCCC), a very broad multilateral treaty aimed at setting the conditions for achieving stabilization of global temperature. Nevertheless, it did not establish any goals or measurable commitments to any specific country, an endeavor that would only be addressed five years later by the Kyoto Protocol.

If the UNFCCC was broad enough to not mention specific sectors such as international transport, the Article 2(2) of the Kyoto Protocol filled this gap by stipulating that Annex I countries should seek to limit or reduce greenhouse gases (GHG) emissions not controlled by the Montreal Protocol for the use of bunker fuels.² More than determining that the international transport should also contribute to the global mitigation efforts, the Kyoto Protocol transferred the negotiation of an agreement to the two sectorial organizations – ICAO and the International Maritime Organization (IMO).

It can be argued that the Kyoto Protocol actually triggered the institution interaction between the UNFCCC and ICAO (ROMERA, 2018).³ Despite this explicit command given by the international climate regime, little progress was made in ICAO in the following years. The lack of knowledge about the real impact of air transport combined with the difficulties in attributing to specific states how much CO₂ was actually emitted by them created an impasse under ICAO. At this first stage, it was only possible to reach compromise on broader statements

² Bunker fuels are heavy, residual oil left over after gasoline, diesel and other light hydrocarbons are extracted from crude oil during the refining process. Bunker fuels are used by both aircraft and ships. Information available at: <http://www.kittiwake.com/fuel_terminology>. Last access on October 20th 2018.

³ Potentially the same interaction may have taken place between the UNFCCC and IMO; however, this interaction is not scope of this analysis, whose focus is the aviation sector.

and generic objectives mainly related to the use of more efficient aircraft technologies and improvements in operations, as stated in the Assembly Resolutions issued from 1992 to 2007.

Part of the explanation for this inaction may lie in the fact that ICAO is an organization dealing with eminently technical issues in which the willingness for compromise is often less difficult, since it is easier to identify and articulate consensus around common interests. In fact, in the air transport, standardization and harmonization of rules of procedures is a shared goal as it reduces transaction costs and improves efficiency (WEBER, 2017). Technical issues are considered in the International Relations (IR) liberal literature on international cooperation as “coordination problems” – rational actors may struggle to find an equilibrium consensual solution, and, once it is found, they will not have high incentives to defeat (MARTIN, 1993). When it comes to this very sensitive environmental agenda, where not rarely is there a trade-off between environmental integrity and economic efficiency, divergent positions among states may arise. In the specific case of ICAO, there is some evidence that the industry also played an important role in forcing the Organization into a deadlock, setting the tone of the debate.

This dissertation moves a step further to argue that the Kyoto mandate prompted an institutional interaction between the UNFCCC and ICAO that resulted in a conflictive climate governance architecture. The conflict was derived from the clash between the two core guiding principles of these two institutions. On the one hand, the primary principle in the international climate regime under the UNFCCC is the *Common but Differentiated Responsibilities* (CBDR) principle. On the other hand, under ICAO, the prevalence is over the non-discrimination and equal and fair principles, which are enshrined in the Chicago Convention.

The CBDR principle is central to the international climate regime, even though different interpretations on its actual meaning and comprehensiveness exist (MAGUIRE, 2013; PAUW *et al.*, 2014). By this principle, developed states recognized the differences of responsibility for the current stage of the warming of Earth's temperature, given that they began their industrialization process much earlier than developing countries. More than acknowledging the differentiated obligations for developed states, the principle became central to the demand for technology transfer, funding mitigation and adaptation actions for developing and less developed states.

Nothing is more just and logical, therefore, than the obligations are also differentiated and proportional to the historical emissions of each country. However, it took years to have this consensus settled. In the context of the negotiations on the international climate agenda, this principle is consolidated and was the basis of the negotiations for the Paris Agreement. Certainly, the interpretation of CBDR has evolved since the 1990's, from a strict stance that only

developed countries could have obligations, to a more flexible approach that allows for differentiated levels of commitments. Under the Paris Agreement, although all states have obligations for the global effort to reduce emissions, they are established on a voluntary basis, according to the national capacities and are proportional to each country stage of development.

When this negotiation rationale of the international regime is transposed under the scope of ICAO, however, a significant conflict between principles emerged. Under the Chicago Convention, states have an obligation to ensure that all their air operators comply with international standards, regardless of their nationality. In other words, all rules and conventions related to air transport should be applied equally to all operators, without distinction between developed and developing countries. When ICAO discussions began on the establishment of measures to reduce CO₂ emissions, there was the assumption that any obligation should be based on the basic principle of that Organization and, thereby, any measures should be applied to all air operators indiscriminately.

In a highly sensitive agenda that may have impact on the economic growth of the industry, effective cooperation outcomes were not easily achieved. Different agendas and interests prevail under ICAO and, as a consequence, the traditional cleavage between developed and developing countries is not so useful for analysis. As it will be further explored in this dissertation, in ICAO, the interests of the industry are very strong, and the Organization is guided by market concerns. According to projections from the International Air Transport Association – IATA (2016f), the air transport sector will increase in a very rapid pace in the next 20 years, mainly driven by the growth of the emerging markets from Asia (i.e. China and India) and Middle East (i.e. Qatar, Saudi Arabia and Emirates). Traditional markets, such as the North American and European ones, will likely be left behind. In this sense, under ICAO, another logic predominates between mature and non-mature markets, which will have a significant impact on the climate negotiation process.

In this regard, the possibility that ICAO could lose its prerogative to negotiate a climate agreement and the aviation sector could be part of a much more comprehensive response prompted a more incisive and active role from ICAO. In addition, two other factors were decisive for ICAO moving forward on this agenda: (i) the possibility of a patchwork of different regional and fragmented responses for curbing emissions from the aviation sector; (ii) the early action taken by the industry, which voluntarily adopted more ambitious environmental goals.

After the European Union threatened to include the aviation sector in their Emissions Trading Scheme (EU ETS), both ICAO and the industry rejected this kind of unilateral action (OBERTHÜR, 2006; DOMINGOS, 2012; GONÇALVES, 2016; TRUXAL, 2017; ROMERA, 2018). Ultimately, the European stance may have been decisive for moving the sector towards

an agreement. In fact, the response of ICAO on the climate regime is subsidiary of the industry's stance on the matter. Nevertheless, the aspirational goals and commitments achieved under ICAO were far from ambitious especially when compared to those goals proposed by the industry itself.

Ten years after the mandate given by Kyoto, ICAO did not achieve any progress on reaching compromise. As a response for ICAO's inaction, in 2007, the Conference of the Parties (COP) under the UNFCCC regime established the Bali Roadmap, a detailed action plan that set the conditions for the negotiation of a new binding agreement to replace the Kyoto Protocol to be adopted in the COP of Copenhagen, in 2009. The prospects that the international climate regime could take on the ICAO's role has resulted in some, albeit unambitious, progress. After 2010, ICAO moved in the direction of agreeing on aspirational goals to improve fuel efficiency by 2% per year and to achieve carbon neutral growth from 2020 onwards (ICAO, 2010a).

In order to achieve those goals, ICAO member-states agreed on the implementation a basket of measures which included technological and operational improvement, the extensive use of sustainable alternative fuels and, on a temporary basis, market-based measures. The Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) was developed in a close collaboration between ICAO and the industry, as an attempt to reconcile the CBDR and the non-discrimination principles. It was adopted by Resolution A39-03, in 2016, as the primary response from ICAO to the international climate regime. Moreover, it constitutes the main mechanism that will allow the aviation sector to achieve, in the short term, the aspirational goal of carbon neutral growth, while the other measures need some time to mature.

CORSIA is a simple market-based measure through which all the CO₂ emissions above an agreed baseline will need to be offset by the purchase of carbon units. It is intended to be a cost-efficient measure in which the price of carbon is determined by market forces. In this sense, the aviation industry can transfer the burden of diminishing its emissions to sectors where it is less expensive. CORSIA's adoption was highly supported by the industry, namely by IATA, as a means to avoid a patchwork of different regional and national emission trading that could increase transactional costs. In this sense, CORSIA was designed to be the only and global MBM scheme for the international aviation.

Agreement was possible under ICAO because CORSIA was designed considering two different approaches, as an attempt to reconcile the interests of mature and non-mature markets. According to the first approach, CORSIA will be implemented in different phases. In the first two periods of its implementation, which will last from 2021 to 2026, only volunteer states will have their routes included in the offsetting schemes. In the last phase of CORSIA, the routes

from developing countries will be also included in the scheme for offsetting purposes. Least-developed countries and countries with a small contribution to the global air transport activities will be exempted during all phases. The tacit agreement may have been that, by “volunteer” states, the ICAO Resolution meant developed countries where mature airlines are located, and China, a fast-growing market. The logic of Paris by which an agreement would only be possible if the greater emitters – United States and China – had obligations may be applied for the ICAO case as well.

This phase-in approach was thus the solution for inserting some kind of differentiation between countries in the ICAO agreement. The non-discrimination principle was reflected in the so-called route approach. Accordingly, there will be no differentiation of obligations for airlines due to their nationality. Once an airline operates a route in which both points – origin and destination countries – are part of the scheme, their emissions will have to be compensated accordingly. Therefore, all air operators will be given equal treatment in the same route.

In this context, the main objective of this dissertation is to analyze the development of the negotiation process that took place under ICAO regarding measures and policies aimed at reducing the GHG emissions from the international air transport sector. It seeks to answer the following research problem: why climate governance architecture under ICAO was highly conflictive in terms of its main guiding principles? The main state and non-state actors involved, the aspects and principles that guided the negotiations that resulted in the adoption of CORSIA as well as the role played by ICAO as an independent actor with a strong bureaucracy will be further analyzed.

The first main hypothesis to be developed is that ICAO is an autonomous and strong international organization that exert authority and legitimacy to set up technical standards and policies for the aviation sector. However, when called to act on environmental issues, it was not so prone to internalize the UNFCCC framework and principles. As a result, an overt conflict of principles has emerged from the institutional interaction created between ICAO and the UNFCCC. This hypothesis is based on the assumption that the principles enshrined in the UNFCCC and the outcomes that stem from the Conference of the Parts – COPs define, to some extent, the international climate regime.

The second hypothesis is that the negotiation process was transferred from the UNFCCC regime to ICAO because ICAO is mainly driven by market concerns and, therefore, state and non-state actors could, firstly, establish a new timing for discussions and, secondly, impose a new rationale for the negotiations. Therefore, a “forum shopping” option may have occurred in order to allow for a greater influence from the industry in the final outcome, which consolidated the logic of the liberal environmentalism, a concept developed by Bernstein (2001).

Furthermore, as secondary hypothesis, it can be argued that there was a very strong pressure coming from the air transport industry towards the adoption of a more cost-efficient measure that was multilateral and global in its nature so as to avoid fragmentation of ICAO's regulatory regime. As a result, this research will try to demonstrate that there may be a correlation between the industry concerns over economic competitiveness and cost-efficiency, and the ultimate design elements of CORSIA.

The timeframe of this analysis is the development of the architecture of climate governance in ICAO from 1992, when the international climate regime was established under the UNFCCC framework, until 2016, when the agreement from the aviation sector was concluded with the adoption of the ICAO Resolution A39-03.

It is important to highlight that this dissertation will not analyze the feasibility and effectiveness of CORSIA, from an economic, social and environmental perspective. Nor will it explore other measures that could have been taken by the sector to curb its emissions. In addition, even if the research points out some of the market-based measures available, it is out of its scope to develop a more in-depth consideration of the benefits and disadvantages of each measure. And, more importantly, the focus of this dissertation is to analyze the climate negotiation process under ICAO from a global governance perspective. Therefore, I recognize that this analysis is far from being a complete piece of work and that more multi-disciplinary studies could enrich the understanding of CORSIA as a multilateral economic response from the aviation sector to diminish its environmental impact.

There is a rich literature and analysis framework of concepts of climate governance and multilateralism with reference to the multilateral negotiations that take place under the UNFCCC (PATERSON, HUMPHREYS & PEETIFORD, 2003; ALDY & STAVINS, 2007; BIERMANN, 2007; CHRISTOFF, 2008; WATANABE *et al.*, 2008; BAUER, BUSCH & SIEBENHÜNER, 2009; O'NEILL, 2017). However, few academic papers have acknowledged such a unique and recent negotiation process that associates the multilateralism of an eminently technical intergovernmental organization with the international regime of climate change, especially from a perspective of IR. Most of the existing literature dated from the period prior to 2016, and, thus, do not analyze the final agreement itself nor the CORSIA. Most literature on the subject focus their analysis on the negotiation process under ICAO and the role played the European Union as a leading actor (DOMINGOS, 2012; GEHRING & ROBB, 2013; GONÇALVEZ, 2016; ROMERA, 2018). More recent literature is scarcer and it is not focused on the interaction between the normative framework of these two institutions – the UNFCCC and ICAO (OBERTHÜR, 2006; ROMERA & ASSELT, 2015; PIERA, 2016).

The ICAO case is emblematic because it is an eminently technical Organization, which regulates the aviation sector. In this case, there is usually a need for harmonization and standardization of procedures, and common interests bring states and industry together in compromises. Nevertheless, when urged to take actions to mitigate GHG emissions from the aviation sector, consensus around this agenda has proved to be much more difficult. A tradeoff between environmental integrity and economic competitiveness emerged under ICAO, confronting developed and developing countries, or, in more precise terms, mature and non-mature air transport markets.

The negotiation process that has lasted more than 20 years – since the Kyoto mandate until the adoption of CORSIA – may shed some important light on how institutional interaction may have occurred between the UNFCCC and ICAO. Moreover, it may demonstrate how the interests of actors are defined under ICAO, and how, and to what extent, the industry may affect them. Analyzing the factors that led to the constitution of this conflictive climate architecture and the alternative tools available to overcome the challenges that this scenario may represent are factors that justify the choice of the theme and the relevance of this research for the field of IR.

From a personal standpoint, it is important to mention why I chose this problem of research. Working in the aviation sector and having participated in the more recent negotiation process for the implementation of CORSIA has shown me, in practical terms, the interest of the application of a theoretical framework from an IR theory perspective. As CORSIA is still a recent endeavor, I came to realize that there are few in-depth analyses on the flaws of this multilateral agreement that was supposed to result in diffuse reciprocity and mutual benefits. Trying to build a preliminary, even if far from complete, proposal of theoretical framework for understanding the negotiation process under ICAO and CORSIA itself was a main driver in my choice for this research.

In order to achieve the objectives of this research, a specific case was chosen – the negotiations of a climate agreement under ICAO to curb GHG emissions from the international air transport sector. The selection of this specific case will allow the author to test the proposed hypotheses and evaluate the development and validity of the concept of climate governance architecture in the context of a more technical monothematic international organization – ICAO.

Furthermore, the divergence of the guiding principles of the international climate regime and those underpinning the negotiations under ICAO may help understand the nuances and distortions created by CORSIA, bearing in mind the institutional interaction between ICAO and the UNFCCC. The choice of this case will also allow the development of empirical explanations

for particular cases, with the possibility of generalizations to establish more complex relationships, based on the inductive method of analysis.

In this regard, a comprehensive review of the existing bibliography on global governance, climate governance, international climate regime, institutional interactions and environmental liberalism was employed. The main framework of analysis to be explored is the concept of conflictive climate governance architecture that may arise when an institutional interaction is triggered on the climate agenda. In this case, the concept of international organizations as international bureaucracies may also be important to understand how ICAO managed to ensure its role as the primary forum to discuss any measure to be taken by the sector.

To support the research, primary sources of documents produced by ICAO, such as resolutions and declarations, as well as position papers presented by states and non-state actors were the basis for the analysis. These primary sources were contrasted with secondary bibliography produced in recent years about the negotiations process under UNFCCC and ICAO. In this case, it is important to mention that the literature was mainly focused on the analysis of the negotiation process itself, and the timeframe did not include negotiations that took place in more recent years, especially in 2016. Therefore, this research has based its analysis on the public documents that are available at the ICAO website. Interviews could have been performed in this case; nevertheless, as negotiation on the implementation of CORSIA is still ongoing in ICAO, and the author is one of the Brazilian negotiators in the ICAO's Committee on Aviation Environmental Protection (CAEP) meetings, it was decided not to use this method, to avoid any biased judgment.

Finally, in order to develop the theoretical framework an extensive literature review was carried out regarding the IR theories related to cooperation and global governance. This review served as the basis for building the argument on conflictive climate governance. This concept was chosen in lieu of international regime and regime complex because it takes into consideration other actors, beyond the state. In the case of ICAO, a framework of analysis that considers the role played by non-state actors, especially the private sector and the international organizations as bureaucracies, may be essential to understand the institutional interaction between the UNFCCC and ICAO, and its final result – CORSIA –, in a more comprehensive manner.

This dissertation is divided into three main chapters. In this first chapter, the theoretical framework for analysis is developed having as a standpoint two main concepts – international cooperation and global governance. Considerations will be drawn on why the concept of global governance may offer a more comprehensive framework for analysis than the traditional axioms provided by the rationalistic approaches of IR theory. Then, the environmental problem will be defined from the perspective of the Anthropocene and the drama of the commons, as a

means to understand how the climate change agenda entails asymmetry of preferences and may impose a constrain for more effective cooperation. The main goal of this first chapter is to develop a framework for analysis based on the concept of conflictive climate governance architecture, on which one of the hypotheses of this research is grounded.

In the second chapter, ICAO is presented by the lenses of international organization as international bureaucracies' literature. The functions, guiding principles, main bodies and configuration of forces under ICAO will be scrutinized. The purpose of this chapter is two-fold. First, it will be argued that ICAO is a strong organization with an autonomous bureaucracy that exert a clear mandate in setting the agenda and providing a platform for negotiations. Secondly, it will also be shown that the traditional cleavage between developed and developing countries may not be so straightforward in ICAO. The size and importance of the aeronautical and air transport market may revert this logic, placing Asia and Middle East as key players as well. Therefore, it may be more relevant to think ICAO's configuration of power in terms of mature and non-mature markets. Finally, this chapter will shed some light on the extent of the aviation sector contribution for the overall GHG emissions.

In the third chapter, the hypotheses of this research will be tested. The primary documentation issued by ICAO, IATA, UNFCCC and states was analyzed in order to understand how the negotiation process took place and how the interaction between UNFCCC and ICAO was developed. The final response from ICAO for the international regime – CORSIA – will be examined considering the reconciliation of the principles of CBDR and non-discrimination. The main purpose is to demonstrate how the institutional interaction between UNFCCC and ICAO created a conflictive climate governance architecture in which an overt conflict between CBDR and the non-discrimination principles emerged. In addition, the description of the main elements of CORSIA is intended to highlight how the conflictive governance may have generated a result that may ultimately revert the logic of both principles.

Finally, the results of this research and the analysis of whether the hypotheses proved to be right are presented in the conclusion. Some final considerations and indications of future research are also included in the last part of this dissertation.

2. GLOBAL CLIMATE GOVERNANCE ARCHITECTURE BETWEEN THE INTERNATIONAL CLIMATE REGIME AND ICAO – A THEORETICAL FRAMEWORK FOR ANALYSIS.

In the International Relations field, theoretical frameworks of analysis are important means to explain empirical events. Each theoretical framework is grounded on axioms for which explanatory variables of the international system can be identified. On the basis of those frameworks, relies the analysis of power relations and how those relations can lead to cooperation or conflict between the main actors of the system – states.

According to the rationalistic and materialistic theories, such as Realism, Neo-Realism and Liberal-institutionalism, anarchy establishes, to a greater or a lesser extent, constraints to effective cooperation between these actors towards common goals. Central to their analysis is the power relation between states, which remain the main and central actor with agency and influence on the international scene.

The problem of climate change as an Anthropogenic consequence is eminently a political issue that requires global solutions. At its core, there are power, morality and economic interests from different actors beyond the state that interact in non-traditional cooperation arrangements. The concept of global governance can shed some light on these new mechanisms and negotiation processes that take place at different levels, past national boundaries, and have the objective of solving common problems, through cooperation and articulation between different state and non-state actors.

In the next sessions, the framework for analysis of the global climate conflictive governance under ICAO will be further developed. First, I will make some considerations on the reason the concept of global governance, rather than the axioms provided by the rationalists approaches of International Relations (IR) or by the international regime literature, is preferred in this case study. Particularly, the emergence of new actors with an agency character helps explain the configuration of power under ICAO, and how the climate response was grounded on a market-based mechanism to offset GHG emissions from international air transport as a consensus of liberal environmentalism.

Secondly, the environmental problem will be outlined under the Anthropocene⁴ and the drama of the commons⁵ perspective so as to explain the reasons why climate change entails

⁴ Anthropocene is defined by some authors as a new geologic era in which human actions have an unprecedented impact on the Earth systems (CRÜTZEN, 2002; RÖCKSTROM *et al.*, 2009).

⁵ The drama of the commons was first described by the ecologist Garrett Hardin (1968). The author outlined a simple parable of environmental degradation under conditions of human freedom. In an open pasture whose access

asymmetry of preferences, jeopardizing, in many cases, effective cooperation between actors. Finally, the conflictive climate governance architecture will serve as a framework for analyzing the conflict between the principles of the international climate regime, based on the UNFCCC, and the ICAO core principles enshrined in the Chicago Convention. In the first case, the principle of *Common but Differentiated Responsibilities* (CBDR) prevails in the cleavage between developed and developing countries, whereas in ICAO, where the industry has a greater voice, there is the primacy of the non-discrimination and equal and fair treatment principles.

2.1. FROM THE MAINSTREAM RATIONALISTIC APPROACHES OF INTERNATIONAL RELATIONS TO THE CONCEPT OF GLOBAL GOVERNANCE.

The classical literature in IR, which stems from Realism and Neo-Realism authors, has primarily, if not exclusively, focused on the state as the central actor that could actually influence and determine international politics. Although the existence of other actors on the international stage was not denied, states were considered the only ones with capacity and agency to change politics (MEARSHEIMER, 2001; MORGENTHAU, 2003; LAKE, 2008; WALTZ, 2010).

The Classical Realism is based on the concept of human nature by Hobbes and on the notions of power and moral developed by Thucydides and Machiavelli (WOHLFORTH, 2008). Authors from this theoretical perspective argue that the state of nature is a condition of constant war and anarchy in which, in the absence of a centralized power, states would be in a constant conflict for power, survival and prestige (MORGENTHAU, 2003). If, in the context of the state, people would establish a social contract, a coordinated act by which individuals would renounce their rights in favor of a sovereign and centralized power, in international politics, anarchy among the sovereign entities would still prevail. In this anarchical system, each state acts in its self-interest, which is defined on the terms of its own survival.

For Classical Realism, the main difference between domestic and international politics does not rely on its very nature, but on the fact that international politics takes place on anarchical conditions. According to Morgenthau (2003), “domestic and international politics are nothing short of two manifestations of the same phenomenon – the struggle for power”. In this

was free, herdsmen would act to increase their “share” of the common good in order to increase their profit. Nevertheless, as the pasture is not an unlimited resource, degradation would be inevitable. This basic thinking was further explored by other authors in the social science field (OSTROM *et al.*, 2002).

case, power was defined mainly in terms of military clout, as well as economic and political capacity.

Without necessarily denying some of the assumptions from the Classical Realism, the Neo-Realism explains international politics based not on the human nature, referred as the first image of analysis, but on the constraints imposed by the structure of the international system. The focus is, thus, on the third level of analysis. In this regard, the anarchical condition defines the nature of international politics (WALTZ, 2010).

The framework for analysis proposed by Neo-Realism takes into consideration the systemic characteristics that limit and exert influence on state actions. The central unit of analysis remains the states, and their internal characteristics are irrelevant to explain their behavior. Although survival is understood as a primordial goal, necessary for the pursuit of all other political ends, states also aim at maximizing their relative gains in terms of resources and capacities. It is the ordering principle of the system that compels its units to behave in a certain way, and not the intrinsic characteristics of human nature.

The distribution of capacity, or, in other words, the distribution of power among the units of the system is also important. Changes in this configuration of power can entail a change within its own structure. According to Ken Booth (2011, p. 5):

In brief, the theory of structural realism explains the international system in relation to a dominant structure (anarchy) defined by the interplay between its component units (states seeking survival) which are characterized by particular distributions of power (the capabilities of the units). Crucially, for Waltz, this is a ('systemic') theory of international politics, not a ('reductive') theory of the units.

For Classical Realism and Neo-Realism, cooperation between states would only be possible in the case of convergence of interests or whenever there were prospects of actual gains. The likelihood for cooperation to take place is almost restricted to issues related to the so-called *low politics*, which are basically economic, human rights and environmental related-matters. *High politics*, on the other hand, would be very unlikely to bring states to cooperative arrangements as they operate in a logic of *self-help* (BARNETT & SIKKINK, 2008). Nonetheless, history shows that states have designed alliances in the security realm, such as the Vienna Concert, in the 19th Century, or even the North-Atlantic Treaty Organization (NATO), established after the Second War. Therefore, it can be argued that the international system does offer some mechanisms that allow for states to overcome the self-help structure (GRIEGO, 1988; BULL, 2002).

Regarding this, it can be assumed that this theoretical framework offers analytical categories to explain why states do not cooperate towards a common good. This non-cooperative feature of the system is a consequence of the asymmetrical distribution of power that makes

states to be concerned in increasing not only their absolute but also their relative power. Thus, states would only cooperate if their perception was that they would have more advantages than other actors. In this context, institutions would affect the prospects of cooperation very marginally (GRIEGO, 1988). For Mearsheimer (2001), for instance, institutions would not have any independent effect on states behavior (KEOHANE & LISA, 1982). According to Griego (1988, p. 485),

For realists, international anarchy fosters competition and conflict among states and inhibits their willingness to cooperate even when they share common interests. Realist theory also argues that international institutions are unable to mitigate anarchy's constraining effects on inter-state cooperation. Realism, then, presents a pessimistic view of the prospects for international cooperation and of the capabilities of international institutions.

It is important to take into account, though, that Neo-Realism was not intended to be a comprehensive theory to explain all aspects of international relations. On the contrary, it was intended to explain few, yet important, issues of international politics. Under the possibility of a nuclear war between the two major powers, IR scholars focused their attention on matters related to war, security and crisis management. Nevertheless, even during the Cold War, the deepening of globalization and the increasing interdependence between economic actors beyond national borders became a phenomenon to be explained and further explored by the IR field (BARNETT & SIKKINK, 2008).

Acknowledging the anarchical nature of the international system, Neo-Institutionalism addressed the question of cooperation under anarchy,⁶ analyzing the conditions under which states might produce sustained forms of coordination in some specific issue areas (KEOHANE, 1984). Broadening the scope of analysis, beyond the national state, this theoretical framework includes non-territorial actors, particularly multinational corporations and international organizations, as also relevant to explain the dynamics of international politics. States are no longer black boxes, as their internal authority can be decentralized and influenced by several other actors through different channels. On the international scene, even though anarchy remains a core characteristic, states are not in a constant struggle for survival; on the contrary, there are incentives for overcoming conflict and engaging in cooperative arrangements.

As a rationalistic theory, Neo-Institutionalism assumes that actors act accordingly to a logic of maximizing their interest, but not based on a *self-help* perspective. As the international system is characterized by a complex interdependence, in which multiple channels of contact

⁶ For both Neo-Realists and Neo-Institutionalists, international anarchy means the absence of a common interstate government (GRIEGO, 1988).

connects societies and corporations and expands the range of policy instruments, states are propelled to cooperate in order to avoid conflict and to obtain better results for common issues (KEOHANE & NYE, 1987). According to Palmsjoki (2006, p. 2):

Neo-institutionalism does not contest the anarchical nature of international relations, rather this approach emphasizes that states are utility-maximizing rational actors engaging in cooperation with other states in order to best achieve their goals in a more stable context of regimes than a purely anarchic environment.

For neo-institutionalist authors (KEOHANE, 1984; KEOHANE & NYE), institutions play an important role in fostering cooperation as they establish institutionalized policy networks of interactions that, to some extent, determine state behavior, inasmuch as they lead to a convergence of expectations. Axerold & Keohane (1995) set forth three analytical dimensions to understand the reasons why states cooperate: (i) the existence of mutual interests; (ii) the uncertainty about the future; and (iii) the number of actors involved.

The reward structure that determines whether there are mutual interests is not only based on objective factors, but also on the perception of the actors about their own interests. In this case, institutions matter because they can change the expectations of the agents and even the reward structure itself, reducing, as a consequence, uncertainties. Therefore, whenever states can mutually gain from cooperation and have incentives to establish cooperative arrangements, institutions are reinforced as they make compromises more credible, reduce transactional costs and ensure reciprocity (KEOHANE & MARTIN, 1982). Institutions, in this sense, are nothing short of a set of rules and practices that prescribe behavior, constrain activities and shape expectations (KEOHANE, 1989; BARNETT & FINNEMORE, 2004).

This theoretical framework helps to understand the conditions under which institutions can have a positive impact on the prospects for cooperation between states, especially when it comes to environmental matters. Nevertheless, it is important also to highlight that interdependence, in this case, will not necessarily nor automatically lead to cooperation. Neither will its consequences be always benign. As power is distributed unevenly among the different public and private actors, the international interdependence is also asymmetrical. To understand cooperation, in this context, it is necessary to analyze how the patterns of power resources are distributed within the system (KEOHANE & NYE, 1987).

The theory of international regimes offers some analytical framework to understand why, under some circumstances and in some specific issue-areas, the incentives for cooperation supersede the constraints related to the structure of *self-help*. The most consolidated definition of international regimes was set forth by Krasner (1982, p. 185) as the “principles, norms, rules and decision-making procedures around which actors’ expectations converge in a given issue-

area.” Reducing the scope of regime analysis to state, Keohane (1989) offered a more straightforward concept by defining regimes as institutions of explicit norms on a specific issue of international relations, which are established by governments.

In the same token, Young (2017) describes regimes as social structures that are recognized as patterns of behavior or practice around which expectations converge, and have been designed to address functionally defined topics. International regimes can be established spontaneously, when there is convergence of expectations. In addition, they can be negotiated through explicit agreement or they can be imposed by a dominant actor that uses its resources to force other actors to comply with the rules of a specific international regime (YOUNG, 1982).

Therefore, international regimes arise when there is a convergence of expectations and interests not exclusively between states,⁷ which allows the emergence of guiding principles and common norms that address a specific problem and regulate a particular issue. States are depicted as rational actors and, as such, they constitute international regimes in order to maximize their own utility function, acting according to their self-interest. In a context of asymmetry of information, moral hazard and high issue density, international regimes become a viable and cost-effective solution given their capacity of improving asymmetry of information, reducing transactional costs and providing legal liability. In particular, international regimes have a greater impact when uncoordinated actions result in Pareto-optimal solutions (KRASNER, 1982).

In the case of climate change, the Neo-Institutionalism emphasizes the need to establish proper institutions whose main purpose is to obtain global benefits through mitigation actions and commitments. The effectiveness of the environmental regime is intrinsically related to its capacity to solve or to mitigate the problems that led to their creation (YOUNG, 2017). As long as multilateral actions are able to maximize results, it can be assumed that states would act rationally if they promote a single and robust cooperative arrangement to tackle issues, such as climate change. Nevertheless, Keohane & Victor (2016) argue that states have failed to establish a single regulatory framework and, thus, a regime complex of climate change has emerged with different, and not rarely conflictive, narrowly-focused regulatory regimes.

It goes without saying that the literature on international regimes is still very state-centered (YOUNG, 2017) and offers a limited framework to analyze the complexity of the current international order. In the case of the agreement on the international civil aviation sector reached under ICAO, even considering the great influence exerted by the international climate

⁷ Although regime literature does not focus exclusively on states, they are still considered the main actors, and little attention is paid by non-state actors as entities with agency and influence on the global stage (INOUE, 2016).

regime, broadening the scope of analysis is fundamental to understand the dynamics behind the negotiation process. Not only is it important to consider how a convergence of expectations between states was achieved, but also to understand how the interaction between institutions – ICAO and the UNFCCC – was shaped and what role the industry played in this process.

It was not until recently that the deep transformation of international society and the emergence of new actors was further considered relevant to capture the functioning of the international system (SCHNEIDER, 2012; KAVALSKI, 2016; LE PRESTE, 2018). Scholars from the IR realm have broadened their scope of analysis from an anarchical international system ruled by sovereign states to the idea of global governance (ROSENAU, 2000; BARROS-PLATIAU, 2004; BIERMANN, 2007; BARNETT & SIKKINK, 2008; OKEREKE, BULKELEY & SCHROEDER, 2009; INOUE, 2016).

In general terms, the concept of global governance refers to an international political system in which different actors – other than states – act through a variety of multilayered mechanisms of transnational rules. Central to the concept of global governance is the shift of agency from the state to a multitude of transnational powerful actors that create new political contexts. It was also important the emergence of new mechanisms of decision-making and rule-making beyond the traditional international treaties and government-centered cooperation arrangements, as well as the proliferation of soft norms in the climate negotiations (BIERMANN & PATTBERG, 2012).

According to Young (2017), global governance can also be understood as the sum of formal and informal coordination mechanisms⁸ created by state and non-state actors to cope with cooperation problems induced by globalization. Global governance has a social function centered on steering collective behavior towards desired outcomes. In this sense, it may be an alternative to overcome collective-action problems while reducing externalities and uncertainties.

According to this definition, global governance has, as one of its main elements, the proliferation of actors that dispose of some resources and agencies to influence the behavior of individuals and corporate actors. Those actors are not necessarily new in the world stage, as they have been playing an important role in the complex interdependence since the 1970's (KEOHANE, 1984; KEOHANE & NYE, 1987; RUGGIE, 2004). The novelty is their number, degree of participation and increased capacity to create an essentially new political context with new actor constellation and powerful relations (BIERMANN & PATTBERG, 2012; BAUER,

⁸ The formal and informal coordination mechanisms are two poles of a large spectrum. Informal mechanisms may be formalized with time as well as formal mechanisms may be ineffective in international law (BROWN-WEISS & JACOBSON, 2000; BODANSKY, 2010).

ANDRESEN & BIERMANN, 2012; TIAHAARA, ORSINI & FALKNER, 2012; GREEN, 2013). In this vein, it must be recognized that technology may be a key driver of private actors' empowerment as well, although this aspect will not be deeply explored in this research.

A main factor that explains the rise of these actors on the international scene is the liberal economic order in a context of deepening globalization and technological interdependence that has broadened the scope of action and empowered individuals and transnational organizations (RUGGIE, 2004). Technological change has facilitated communication across boundaries and increased the relative share of transnational political relations and activities. Furthermore, the globalization of economic relations has strengthened interdependency among societies and created a range of powerful actors capable of creating and maintaining a degree of order within its domain (ROSENAU, 2000; HURRELL, 2005).

The authors of global governance concentrate their analysis on the multiplication of spheres of authority between various actors involved, beyond the traditional notion of state or state actors. For some of these authors (FINKLESTEIN, 1995; ROSENAU, 2000; DINGWERTH & PATTBERG, 2005; GREEN, 2013), non-state actors have also a great influence on the international agenda and on the decision-making process. In fact, the influence of these actors is not limited to the territorial limits of their states, as they are, by its own nature, transnational.⁹ Green (2013), for instance, mentions the specific case of the Kyoto Protocol, which not only is a fundamental aspect of the climate regime, but has also been able to attract private actors whenever it provides economic instruments that work as positive incentives.

Therefore, states are no longer the exclusive actor of international politics as there is an increasing participation of transnational networks operating in a reconstituted "global public domain" (RUGGIE, 2004). As a consequence, the boundaries between public and private international law become more blurred. According to Ruggie (2004, p. 519),

"The effect of the new global public domain is not to replace states, but to embed systems of governance in broader global frameworks of social capacity and agency that did not previously exist."

Another core characteristic of global governance is the emergence of new mechanisms of transnational rule-making and rule-setting, including transnational regimes, public-private partnerships and market-based arrangements (BIERMANN & PATTBERG, 2012; PATTBERG, 2012; BÄCKSTRAND *et al.*, 2012; BULKELEY, 2012). These mechanisms refer to a set of rules and decision-making procedures that are created and implemented mainly

⁹ Recent IR theory states that levels of transnational governance are so interconnected that they demand new analytical tools (ROSENAU, 1990).

by non-state actors in a common agreement with state actors, without the need of enforcement from state authority (YOUNG, 2012). On the basis of these new mechanisms, relies the liberal rationale that markets may need to respond to state failure, shaped by the functional need to supply better governance (BÄCKSTRAND *et al.*, 2012).

Finally, global governance is also distinguished by new types of horizontal and vertical segmented interlinkages and clusters of rule-making and rule-implementation (ZELLI, GUPTA & VAN ASSELT, 2012; BUSCH, GUPTA & FALKNER, 2012; ABBOTT *et al.*, 2015). Policies and regulatory frameworks are often fragmented in two different, yet complementary, ways. Firstly, they are segmented vertically between subnational, national, international and supranational structures of authority; secondly there is an overlapping horizontal system of policies and rules maintained by a variety groups of actors (BIERMANN & PATTBERG, 2012). Not rarely are these novel arrangements praised as effective alternatives to traditional intergovernmental cooperation, which has failed in many cases to solve complex global problems, such as climate change, for instance. International organizations are, in some cases, used as intermediate to reach specific goals (ABBOTT *et al.*, 2015).

Global governance has consequently been consolidated as an important and useful framework for analysis; however, it is not a homogeneous field of research (BIERMANN, SIEBENHÜNER & SCHREYÖGG, 2009). The term can be either used analytically as a description of the current sociopolitical international reality in which nonhierarchical modes of governance emerge along with the inclusion of private actors. Alternatively, the term can also be used in a normative connotation to advocate a political solution to address the challenges imposed by globalization (BIERMANN & PATTBERG, 2012).

Power considerations are of paramount importance in this framework for analysis provided by global governance. In fact, according to Barnett & Duvall (2005), governance and power are intrinsically related. For Hurrell (2005), global governance has three main goals: (i) promotion of common interests; (ii) mediation of difference; and (iii) management of power. In this sense, global governance has, at its core, elements of power given that it provides rules, structures and institutions that guide, regulate and control social, economic and political dimensions of international relations.

Barnett & Duvall (2005, p. 8) define power as the production of effects that shape the capacity of actors to determine their own circumstances in their social interactions with other actors. Accordingly, there are four dimensions of power in the global governance. The first concerns compulsory power, a most traditional notion of power related to material, symbolic

and normative resources that allow one actor to have direct control over the other. In this context, powerful states are able to determine the content and direction of global governance by using their capacity to redefine behavior of other, less powerful, actors.

The second dimension is the institutional power, which is a more indirect form of exercising power. In this case, institutional arrangements act as mediators and, thus, one actor cannot directly influence the other. Institutions set rules and procedures that constrain the actions and conditions of their member and, not rarely, they acquire autonomy beyond their original mandate. The third and fourth dimensions of power are very similar to one another and they are related to structural and productive power. Structural power concerns the constitution and distribution of social capacities and interests of actors in the system, while productive power is the result of the set of meanings and signification of roles and identities that are socially constructed (BARNETT & FINNEMORE, 2005).

Therefore, even when admitting that institutions are chosen for their effectiveness and efficiency in dealing with common problems, an underlying question that must be posed and will guide this research is which institutions are chosen and for what reasons. The consideration of power highlights the global structures, processes and institutions that shape global governance (BARNETT & DUVALL, 2005). In this regard, the choice that states and non-state actors often face is what institutions offer the best tradeoff between effectiveness and the maximization of their interests. As a consequence, states will set the agenda in the most convenient international organization that best suits their interests (HURRELL, 2005). This is one possible reason why the climate agenda was treated as an environmental issue.

It is pivotal to have in mind the reason ICAO was given a mandate to deal with environmental and climate change concerns considering its original mandate to regulate technical aspects of civil aviation. The interests of actors other than the state (i.e. industry) and power considerations of those actors, in this case, may be a central determinant for transferring the negotiations on mitigation actions of air transport from the international climate regime, centered on the UNFCCC, to the ICAO, a hypothesis that will be further explored in the next chapters.

2.2. GLOBAL ENVIRONMENTAL GOVERNANCE.

Bearing in mind the more comprehensive framework provided by global governance literature (INOUE, 2016; LE PRESTE, 2018), global environmental governance offers an understanding on how the decision-making process and the establishment of rules take place in

the global stage, considering the different actors, not only the state, and the myriad of fragmented mechanisms that allow for non-traditional cooperation arrangements. More importantly, global environmental governance focuses on the capacity, functioning and results of the institutions and rule-making processes that lead to socially and environmentally sustainable outcomes (BENNETT & SATTERFIELD, 2018).

On this matter, it is important to consider the context in which global environmental governance takes place, as it imposes constraints for action of the actors involved (OKEREKE, BULKELEY & SCHROEDER, 2009; INOUE, 2016). Global environmental governance is no longer the sole domain of governmental cooperation (PATERSON, HUMPHREYS & PETTIFORD, 2003). Perhaps, in no other issue-area the influence of non-state actors and the emergence of transnational mechanisms in a fragmented architecture is so compelling than in global environmental governance.

Human actions, in this case, have certainly become a driving force in the planetary system (BIERMANN, 2014; CHANDLER, 2018). The way the human species has developed and organized itself, in social and economic terms, is having a significant impact, in a non-linear way, on many large Earth systems, altering its functioning and pushing natural resources to their limits. The extent of those consequences has led some authors to affirm that humankind has entered a new era, from the Holocene to the Anthropocene (BIERMANN, 2014; BONNEUIL & FRESSOZ, 2016; VIOLA & BASSO, 2016).

If the Holocene was a geologic epoch of climate and ecological stability that allowed the development of societies; during the Anthropocene, humans became a major environmental force, playing a decisive role in promoting rapid and increasing changes in the environment. Higher concentration of carbon dioxide in the atmosphere, land-use change, ocean acidification, genetically modified organisms, new types of radioactive substances and massive deforestation are just some of the human actions that are causing profound, and maybe irreversible, modifications to the environment. Anthropocene is, therefore, a human-centered geologic epoch that may last for centuries to come and that will demand environmentally sustainable management as well as new approaches and policies models (CRUTZEN, 2002; BIERMANN, 2014; CHANDLER, 2018).

“L’Anthropocène est une prise de conscience essentielle pour comprendre ce qui nous arrive. Car ce qui nous arrive n’est pas une crise environnementale, c’est une révolution géologique d’origine humaine.”
(BONNEUIL & FRESSOZ, 2016, p. 11).

The Anthropocene and the overtaking of the planetary boundaries¹⁰ are intrinsically related. The limits to planetary boundaries are associated with the planet's biophysical subsystems or processes, therefore defining the balance between human actions in close respect to the Earth system (ROCKSTROM *et al.*, 2009). If those limits are crossed, there will be adverse consequences for the environmental stability. Some authors (VIOLA & BASSO, 2016) state that two of those limits have already been surpassed: the nitrogen and phosphorus cycles, due to the extensive use of fertilizers, and the integrity of biosphere, as a direct consequence of overpopulation and the increasing emissions of GHG into the upper layer of the atmosphere.

The climate system is an example of a complex system that is changing dramatically under the Anthropocene (YOUNG, 2017). Although climate change is not a new phenomenon, the human influence on climate conditions has increased since the Industrial Revolution, reaching an unprecedented scale and dimension in the beginning of the 21st century (BERNAUER, 2013). The main force behind this planetary scale is the extensive use of fossil fuels as the basic energy matrix of the economic model adopted by societies (IPCC, 1990).

Tackling climate change during the Anthropocene requires a collective action as a way to overcome the tragedy of the commons (OSTROM, 1990; DIETZ *et al.*, 2002). Common or collective goods are resources to which we have open access without any restriction or regulation on their use. In other terms, common goods are not exclusive, in the sense that there is no way to exclude their consumption even from those who have not contributed towards their provision (VIOLA & BASSO, 2016), precisely for their intrinsic characteristic. Collective goods may be used in a non-sustainable manner, causing overexploitation and scarcity. Some kind of regulation on its use is therefore required (DIETZ *et al.*, 2001; STEVENSON, 2018).

The drama of the commons became a symbol of the degradation of the environment to be expected whenever individuals are in need of a scarce resource (DIETZ *et al.*, 2001). At a point, individuals are caught in the prisoner's dilemma: each individual must decide on how sustainable the long-term use of a common resource can be; if all individuals restrain themselves, then the resource can be sustained. Nevertheless, if each individual chooses independently, without the capacity to engage in a binding contract or cooperative arrangement, each one will choose the dominant strategy, which is defection, ultimately resulting in the collapse of the resource.

¹⁰ There are nine processes for which planetary boundaries are defined: climate change; rate of biodiversity loss (terrestrial and marine); interference with the nitrogen and phosphorus cycles; stratospheric ozone depletion; ocean acidification; global freshwater use; change in land use; chemical pollution; and atmospheric aerosol loading (ROCKSTROM *et al.*, 2009).

A dilemma arises: individually rational strategies may lead to collectively irrational outcomes. Moreover, if the individual cannot be excluded from obtaining the benefits of a collective good, there is little incentive to contribute voluntarily to the provision of the specific good, especially when costs are too high. As a consequence, the free-rider problem occurs (BERNAUER, 2013).

For climate change mitigation requires cooperative arrangements that promote a sharp reduction of GHG emissions in the atmosphere, as a way to ensure the common and sustainable use of this natural resource. According to Viola & Basso (2016), there are twelve possible forces for decarbonizing global economy, which demand a new economic model based on greener and more efficient fuels and a change in the consumption practices of populations.¹¹ However, neither the state nor the market can promote a transition for a greener economy alone or enable individuals to sustain long-term productive use of natural resources systems.

The consequences of human actions on the environment are not constrained within national limits; they are global by their very nature. Therefore, coordination and cooperation between state and non-state actors are needed, according to a logic that goes beyond complex interdependence, to what Biermann (2014) has called *functional interdependence*. In this sense, environmental problems may be originated at local levels, but have global consequences, and political strategies designed for one economic sector may also have serious repercussions in other sectors.

The Anthropocene, in this sense, must be understood as a political phenomenon that requires political solutions through an effective institutional framework of global cooperation and integration at the global level (BIERMANN, 2014). It also entails engaging in polycentric systems of public and private spheres of activities (YOUNG, 2001), in which the planetary system is considered through an integrated perspective encompassing humans and nonhumans elements (BIERMANN, 2016). The aim of global environmental governance is, in this case, to manage individual behaviors towards policies that are able to achieve environmental and socially sustainable outcomes. Nevertheless, some authors (VIOLA, FRANCHINI & RIBEIRO, 2012) argued that the current international system is characterized by a conservative hegemony in which states act according to their self-interest defined in a short-term perspective.

In this regard, some authors argue that global environmental governance should be designed to be effective, equitable, responsive and robust (BENETT & SATTERFIELD, 2018).

¹¹ The twelve forces are related to increasing energy efficiency and diminishing the dependence on fossil fuels, promoting collective transportation, curbing deforestation, modernizing agriculture techniques, developing carbon sequestration and geo-engineering technologies, fostering a vegetarian way-of-life and online meetings, reducing fertility rate in Africa, Middle East and Southern-Asian countries, improving water use and curbing the growth of air traffic (VIOLA & BASSO, 2016, p. 4).

In other words, global environmental governance must support the maintenance of the system integrity and functioning while employing inclusive process that ensure fair results. Furthermore, given the nature of the problem it aims to address, it must be flexible enough to enable adaptation to changing realities, while also ensuring the effectiveness of institutions in period of crisis.

One of the most striking areas of global environmental governance that demands collective action through multi-layer transnational cooperative arrangements is climate change. Anthropogenic climate change was inserted on the international agenda in the late 1980's, when the first scientific studies developed by the Intergovernmental Panel in Climate Change (IPCC) concluded that the Earth temperature was increasing in a unprecedented scale (IPCC, 1990). In this case, the epistemic community played a relevant role in framing the problem and shedding some light on the catastrophic effects that this increase in the temperature could have on different ecosystems and on the rise of sea levels.

The fundamental landmark of the global climate governance architecture is based upon the principles and mechanisms consolidated in the UNFCCC. Negotiated during the United Nations Conference on Environment and Development, in Rio de Janeiro, the agreement aims at promoting measures to stabilize the GHG concentrations into the upper layers of the atmosphere, reducing the anthropogenic influence in the climate system. This stabilization should be reached in a timeframe that would allow the natural adaptation to climate change, so that economic development could be achieved in a sustainable manner (UN, 1992).

The negotiation process that resulted in the adoption of the UNFCCC was guided by the so-called principle of *Common but Differentiated Responsibilities* (CBDR). According to this principle, developed states recognized the differences of responsibility for the current stage of global warming, since they have begun their industrialization process decades earlier than developing countries. It is nothing but fair and logical that the adoption and implementation of differing commitments for different states take into account their diverse circumstances and capacities, their historical contributions to GHG emissions and their specific development needs (PAUW *et al.*, 2014). The principle of CBDR is enshrined in Article 3.1. of the UNFCCC, as follows:

3.1. The Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities. Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects thereof.

Because of the CBDR principle, the developed countries participating in the Convention were encouraged to take the lead in combating climate change and its effects, taking into account the specific needs of developing countries, especially those particularly vulnerable to the negative effects of change in climate. In addition to attributing differentiated obligations for developed states, the principle has also become central to the demand for the transfer of technology and for financing mitigation actions for developing and least-developed states (MAGUIRE, 2013).

The UNFCCC is, however, a broader international treaty that, while formalizing the commitment of states to the adoption of mitigation measures, does not establish targets that can be measurable. Nor does it mention targets for specific sectors of the economy, and especially, there is no reference to the international transport sector. In order to bridge this gap, the Kyoto Protocol was formalized as a supplementary agreement, defining the target of a 5% reduction in emissions by 2012, based on the year of 1990. This goal of reducing emissions was specific to the so-called Annex I countries,¹² which basically encompassed developed states. Even without the ratification of the United States, the Kyoto Protocol started at full force with the participation of Europe, Canada, Australia, Japan and Russia.¹³

Although not very ambitious in terms of quantifiable goals, the Kyoto Protocol established the soi-disant flexible mechanisms, through which Annex I countries could meet part of their quantified commitments to reduce GHG emissions. These flexible mechanisms were intended to enable more cost-efficient manners to reduce emissions across different sectors, and they include the trading emission schemes (Article 17) and the Clean Development Mechanism (Article 12). Those mechanisms constitute the transnational multi-layer mechanisms that have emerged in the global governance architecture and, as it will be argued in the next sections, they are nothing short of the consolidation of the liberal economic rationale applied in the environmental governance (BERNSTEIN, 2001).

It should be highlighted, though, that tackling climate change policies is challenging. Both the cause and effect of the Anthropogenic climate change are related to most areas of human activity. Therefore, it requires measures in a variety of sectors, from energy and transport to land use and urban development, all of which are closed linked to the development goals of states (ASSELT *et al.*, 2005). Additionally, the structure of the problem is malign and entails a severe asymmetry of preferences, hampering, in many cases, effective cooperation

¹² The list of Annex I Countries to the Kyoto Protocol is available at: < https://unfccc.int/process/parties-non-party-stakeholders/parties-convention-and-observer-states?field_national_communications_target_id%5B515%5D=515>.

¹³ UN. Status of ratification of Kyoto Protocol. Available at: < http://unfccc.int/kyoto_protocol/status_of_ratification/items/2613.php>.

between actors (KEOHANE & VICTOR, 2016), and setting the stage for a conflictive climate governance architecture, as it will be further discussed in the other sections in this dissertation.

2.3. CONFLICTIVE CLIMATE GOVERNANCE IN A FRAGMENTED ARCHITECTURE.

As already mentioned in the previous sections, the architecture of global governance is characterized by different degrees of fragmentation, which is mainly a result of a patchwork of several institutional arrangements that are differentiated by their features, constituencies, scope and range (BIERMANN, SIEBENHÜNER & SCHREYÖGG, 2009; DAILLIER *et al.*, 2009; BIERMANN *et al.*, 2012; ZELLI *et al.*, 2012). This fragmentation comprises not only organizations and international treaties, but also international regimes in a broader sense, including, therefore, principles, norms and decision-making procedures (BIERMANN *et al.*, 2009).

From a legal perspective, the fragmentation of global governance is a result of the proliferation of increasing specialized international regulations and the regionalization of international law (HAFNER, 2004). The fragmentation of global governance also stems from the institutional interactions, in which an institution directly affects the institutional development, decision-making process or effectiveness of another institution in the same issue or in crossing areas through influencing the preferences of their main actors (OBERTHÜR & GEHRING, 2006).

The fragmented characteristic of global governance does not imply a less harmonious normative understanding of global order though. Different levels of fragmentation may lead to different results of global governance, without necessarily assuming that one result is more effective than the other (BIERMANN, SIEBENHÜNER & SCHREYÖGG, 2009). A fragmented architecture can have a better focus and a positive impact, fostering participation of laggard states to the negotiation process of specific commitments. It can even allow the negotiation of agreements with a smaller number of countries, especially when deadlocks are preventing any progress in larger forums. Furthermore, it can broaden the participation and intensify the influence of non-state actors in the decision-making process.

On the other hand, some authors (ASSELT, 2007; ZELLI, 2011) point out that, when it comes to the global environmental governance, the overlapping institutional arrangements and regimes may not only jeopardize the coherence of the system, but it could also lead to an open conflict between treaties and principles. This fragmentation can ultimately lead to a “forum shopping” in which states may choose to engage in some institutions or regimes because they

best suit their interests and preferences (RAUSTIALA & VICTOR, 2004; ZELLI, 2011). Another shortcoming that may stem from a fragmented architecture is coordination gaps between institutions leading to a regulatory vacuum in some specific areas (BIERMANN *et al.*, 2012).

Taking into account this inherent structural characteristic of international relations, the architecture of global governance may have different degrees of fragmentation, which may lead to integration, cooperation or conflict between regimes and institutions. In this regard, Biermann *et al.* (2009) distinguishes different types of fragmentation, based on three variables: (i) degree of institutional nesting and overlapping between decision-making systems; (ii) compatibility between norms and principles; and (iii) type of actor constellations.

According to these variables, the global governance architecture can be more synergistic when there is a high level of integration between institutions and regulatory framework supported by all the relevant actors. Besides, there is no overarching conflict between its main rules and norms. The most well-defined example for a synergistic architecture is the global governance on the ozone depletion. The Vienna Convention of 1985 established the grounds upon which restrictions for the use of chemical substances were imposed for states. All the subsequent Protocols related to the matter are closely linked to the Vienna Convention, which serves an integrative umbrella framework (BIERMANN *et al.*, 2012).

Despite having a lesser degree of integration, global governance can also be cooperative. In this scenario, there is no normative conflict and the relevant actors are part of the regime, and they cooperate among themselves. Policies in the same area are defined, decided and monitored through different institutions or a core institution. Even if some specific countries are not all part of those institutions, this does not prevent, however, an overall integration within the governance architecture. One example of cooperative architecture is the relation between the UNFCCC and the Kyoto Protocol. Many of the rules and principles enshrined in the Protocol stem from the Framework-Convention; nonetheless, one of the largest emitters of GHG, the United States, is not part of the Protocol and threatens to quit the climate regime in 2020 (BIERMANN *et al.*, 2012), and, as such, has no bidding obligations to cut its emissions, creating a higher degree of fragmentation within the regime.

There is also a scenario in which global governance may be conflictive. In this case, institutions are mostly unrelated and have overlapping decision-making procedures. In addition, there is an open conflict between the principles, norms and rules that constitute the different international systems or regimes. Also, there are different memberships that are driven by actor coalitions that accept, or even advance, these conflicts. The example found in the literature concerns the regulation of access and benefit sharing of plant genetic resources (BIERMANN, SIEBENHÜNER & SCHREYÖGG, 2009). In this case, there is an open conflict between the

Convention of Biodiversity and the Nagoya Protocol, which reaffirms the sovereign rights of states over their biological resources, and the principles enshrined in the TRIPS agreement, aimed at strengthening intellectual property rights.

Power considerations in this case are of paramount importance. When the most powerful countries are unable to impose their preferences in a specific regime or arena, they are more likely to foster a conflictive fragmentation of global governance. They will transfer discussions and the decision-making process to regimes where they can better exert their power, legitimizing and empowering, as a consequence, other institutions (ZELLI, 2008).

In the case of climate change, its intrinsic characteristic makes more difficult to establish a single legal and institutional framework and thus it has become a case of institutions interaction as well (OBERTHÜR & GEHRING, 2006). In this regard, global climate governance has increasingly emanated from different sources and has become more fragmented. The fragmentation of global climate governance poses a significant challenge given that different international regimes¹⁴ may lead to overlapping norms, principles and ultimately to a conflict between institutions.

2.4. LIBERAL ENVIRONMENTALISM AS AN OVERARCHING PRINCIPLE.

The global environmental governance, particularly the climate governance, is embedded in norms and values that not only influence but, to some extent, determine its outcomes and define state and non-state actors' behavior. In other words, norms matter because they constitute identities and meanings for the governance structure, empowering some actors and legitimizing some actions in the detriment of others. Therefore, in order to understand the dynamics and results of any negotiation process on environmental issues, it is necessary to identify not only the functional requirements of global climate governance, but also what norms and values are represented by it. According to Bernstein (2001, p. 3-4),

While research on the creation, design, and effectiveness of international institutions addresses crucially important questions, such studies generally lack a critical examination of what kind of governing norms institutions embody or why those norms came to dominate global environmental governance. Rather, an assumption often pervades the mainstream academic literature that any cooperation on environmental problems means progress toward a more ecological international order.

¹⁴ IR theory has a research agenda on regime complex as well (VICTOR & RAUSTIALE, 2010; ORSINE, YOUNG & MORIN, 2013).

Consequently, it should be recognized that the interests of state and non-state actors are greatly influenced by the prevailing norms and identities of the current international order. Global climate governance and international climate regime are, to a degree, reflection of these norms in which liberalism and market concerns play a decisive role. Negotiation processes occur within a broader normative context that shape those interests, adding another layer to the consideration of power structures. In some cases, this normative context can be disregarded though (BERNSTEIN, 2001).

According to Ruggie (1982), the content of the international order that emerged after the Second World War reflected the principles promoted by its hegemon, the United States. The structure of this international order is based on the principles of market liberalism and free trade. International institutions and regimes are designed to function accordingly to market rules and interests and taking into account those principles. The compromise of embedded liberalism has ultimately legitimized international markets by reconciling them to social values and shared institutional practices (ABDELAL & RUGGIE, 2009).

Based on the same assumptions, Bernstein (2001) developed the concept of liberal environmentalism, which the author considers as the overarching principle of the global environmental governance. The basic idea is that the liberal economic order does not preclude environmental protection. On the contrary, environmental protection is also embedded in the liberal order and, as such, market mechanisms offer a primary response for state and non-state actors to achieve global environmental goals. In this regard, sustainable development is the underpinning concept behind the liberal environmentalism perspective (BERNSTEIN, 2002).

Liberal environmentalism is based on norm-complex¹⁵ that governs relations of authority and the values promoted and that define and regulate activities in the global environment governance. These norm-complex encompasses the privatization of common goods, the promotion of free trade, and the use of market-based instruments as the preferred means of environmental protection. In this regard, since the Kyoto Protocol, market mechanisms have been emphasized as viable solutions to reduce GHG emissions, assigning rights of emissions to stakeholders and creating a carbon market in which buyers and sellers act according to liberal principles. This framework ultimately enables emissions reductions where it is most efficient to be achieved, as long as market actors are constrained to adopt environmental behavior.

¹⁵ According to Bernstein (2001, p. 6), a norm-complex is “a set of norms that governs relations of authority and the values promoted that define and regulate activities in a particular issue area. A norm-complex need not be stated explicitly, but can be inferred from specific norms.” In this sense, liberal environmentalism represents the norm-complex in which liberal principles are reconcile with the goal of protecting the environment. The liberalization of trade and finance is considered consistent with, and even necessary for, international environmental protection. The norm-complex, furthermore, is also grounded on market-based measures. Finally, the liberal environmentalist can be summarized by the norms encompassed by the concept of sustainable development.

Nevertheless, in the beginning of the early efforts to tackle climate change and other environmental problems, the needs of human beings were considered, in some way, incompatible to the preservation of natural resources and the upper layers of the atmosphere. The unregulated industrial development, the pollution of natural resources and overpopulation were highlighted as the negative consequences of the economic model promoted by Western society and, accordingly, some limits of economic growth should be considered in order to protect the environment. In this sense, the report *The limits to growth* (MEADOWS *et al.*, 1972, p. 183) stated that:

We cannot say with certainty how much longer mankind can postpone initiating deliberate control of his growth before he will have lost the chance for control. We suspect on the basis of present knowledge of the physical constraints of the planet that the growth phase cannot continue for another one hundred years. Again, because of the delays in the system, if the global society waits until those constraints are unmistakably apparent, it will have waited too long.

It comes with no surprise that this perspective, consolidated in the Report *The Limits to Growth*, did not reach out governments nor the private sector during the Stockholm Conference, in 1972. As a consequence, little consensus on actions to reduce pollution of natural resources or to reduce GHG emissions was possible achieved. In particular, the denial of market principles for developing countries, accused of devastating their natural resources and promoting uncontrolled birth rates, led to a confrontation between conservationists and environmental scientists, on one hand, and developing nations, on the other. From this first confrontation, though, attempts to link environmental concerns and economic development into a single framework emerged.

The 1992 United Nations Conference on Environment and Development, also known as the Earth Summit, is a landmark for the institutionalization of liberal environmentalism (BERNSTEIN, 2001). The international community recognized that economic development issues could not be considered apart from environment issues, as stated in the Brundtland Report (UN, 1987). As a result, it consolidated the idea that economic development on the basis of liberalization is not only compatible, but even necessary for the environmental protection. The concept of sustainable development was coined as the dominant framework for global environmental governance. In this sense, there was a transformative reformulation of environmental concerns admitting the maintenance of the current economic model, based on market economy, and the establishment of sustainable economic goals.

Moreover, the Earth Summit put forward many of the ideas developed by the Brundtland Commission in the Report *Our Common Future*, which emphatically places environmental concerns in the context of an overall strategy of development. One of the most important one for the developing countries was that poverty is a major cause and effect of global environmental problems. It is therefore impossible to effectively deal with environmental problems without a broader perspective that encompasses the factors underlying world poverty and international inequality. Even if all countries have common responsibilities when it comes to environmental protection, they also have the right to develop their societies, bridging the gap between the developed and developing world.

Recognizing that liberal environmentalism is the basis of the current global climate governance does not imply that the most effective outcome nor that the optimum solution was reached in the ICAO negotiation process. The main argument to be developed is that the norms and values of economic liberalism have underpinned the main actors' interests and have strongly influenced the climate response under ICAO.

CORSIA is a market-based solution, in which the price of carbon and the choice will be determined by the market itself. Limited governmental interference and unlimited to the economic growth of the industry were the conditions for any discussion on climate goals under ICAO. Although a compromise of liberal environmentalism has ultimately allowed for an agreement under ICAO, conflicts between the main principles of the international climate regime and ICAO made this compromise more difficult, establishing a conflictive climate governance architecture that will be further explained in the next sessions.

3. THE POWER OF RULES OR THE RULE OF POWER IN THE INTERNATIONAL CIVIL AVIATION ORGANIZATION?

ICAO is a technical organization created to promote coordination among its members and to resolve common technical problems. Nevertheless, the Organization is not a neutral structure. Nor is it composed solely by states. As it will be explored, ICAO is also constituted by a very strong bureaucracy and it is largely influenced by non-states, primarily the industry. Although environmental groups also participate in the ICAO discussions, not rarely has the industry's interests taken precedence and they may have been very decisive for the final response from the aviation sector to curb their GHG emissions.

Therefore, in the first section of this chapter, it will be presented the International Relations theory on the role of international organizations and their bureaucracies in the context of an asymmetrical multilateralism. In the second part of this chapter, it will be analyzed, in more details, the ICAO's functions, structure and internal configuration of power. It will be argued that the traditional division between developed and developing countries may not be so straightforward in the case of the ICAO's member-states, as the size and importance of their aeronautical industry may revert this logic. In this regard, ICAO is mainly driven by the interests of mature and non-mature markets, which have been trying to foster their industry's development on the basis of the non-discrimination and equal treatment principles.

Finally, the last part of the chapter will see to the contribution of the civil aviation GHG emissions for the aggravation of the anthropogenic climate change problem. The possible set of measures – both technical and economic – that could be adopted by the sector to address the issue will also be taken into account. The main purpose of this Chapter is to describe the main factors and determinants for the climate negotiation process that took place in ICAO, triggering the institution interaction with the UNFCCC that has ultimately led to a conflictive governance architecture, as will be further argued in the Chapter 4.

3.1. THE CONCEPT OF ASYMMETRIC MULTILATERALISM AND THE THEORY OF INTERNATIONAL ORGANIZATIONS AS BUREAUCRACIES.

The international system in the 21st century is far more multilateral than it was in the past, partially due to the increasing interdependence and interconnectedness between actors and systems (HURELL, 2013). Ruggie (1993) defines multilateralism as the coordination between

policies of different countries on the basis of common principles, as opposed to the idea of imperialism or bilateralism. Multilateralism represents a generic institutional form, implying institutional arrangements that, among others, manage coordination problems and resolve collaboration problems based on common principles at the international level. Therefore, the need to overcome conflict and to find solutions would eventually lead, although not automatically, to cooperation among states through multilateral institutions, assuming that they are rational actors in an environment of complex interdependence (KEOHANE & NYE, 1987).

According to Ruggie's definition (1993), multilateralism is based on three normative aspects: (1) indivisibility among members concerning a specific behavior; (2) general principles for states behavior; (3) diffuse reciprocity. In this case, indivisibility refers to a social construct by which different actors come to an agreement on a certain kind of behavior or course of action that they identified as appropriate, useful or desirable. Furthermore, actors usually agree to this course of action or behavior because they believe that the benefits stemming from the possible outcome will be divided in an equal or fair basis between them. Effective multilateralism, in this sense, comes to mean governance processes and institutions that provide the authority needed for collective action, creating more far-reaching and acceptable results (PRANTL, 2013).

According to Devin & Smouts (2011), though, the term multilateralism was coined by the United States to justify the North-American presence in Europe after the Second World War, as well as during the General Agreement on Tariffs and Trade (GATT) negotiations and the creation of NATO. Still, the post-war world was Western-centered and, therefore, much more restricted in terms of membership. Currently, emerging and regional powers are indispensable members of the international order, so that the range of states with a voice and with capacity to design global governance architecture has been widely expanded (HURRELL, 2007).

When it comes to the climate change regime, some authors (NEWMAN, THAKUR & TIRMAN, 2006; ZARTMAN & TOUVAL, 2010) have questioned the effectiveness of multilateralism as a promoter of international cooperation. The absence of large emitters in the regime may endanger the environmental integrity of any agreement, especially if one considers that those actors have greater bargaining power. Moreover, the heterogeneity of interests across developed and developing countries also hampers indivisibility among actors, which is a central pillar of multilateralism (RUGGIE, 1993). This relative inequality of power between states, in which some exercise greater influence in the definition of the agenda and in advocating their interests, would create an asymmetrical multilateralism. In other words, there are rule-makers and rule-takers (HURRELL & WOODS, 1999) in the current global climate governance architecture, which jeopardizes the sense of diffuse reciprocity as well.

Notwithstanding those setbacks, multilateral institutions provide platforms to mobilize actors and coordinate collective actions (HURRELL, 2013) and, in this regard, international organizations are important players in the global governance architecture. According to the functionalist perspective, international organizations are established by states to prompt their interests and agendas, to reduce asymmetry of information and to ensure the fulfillment of international commitments, in a nonpolitical and unbiased manner. Furthermore, international organizations have as one of their main functions the provision of public goods inasmuch as they help states overcome problems associated with collective actions, enhancing, as a consequence, collective welfare (KARNS, MINGST & STILES, 2015).

Nevertheless, international organizations are not neutral structures as functionalist theories have argued. Rather, they develop new rules and routines aimed at regulating and transforming the international scene in a varied of issue-areas. International organizations provide, therefore, a normative framework not only for the state, but also increasing for non-state actors to act. Besides this normative framework, organizations are also formed by an administrative structure that are the core basis of its functioning. In fact, the agency of the international organization derives greatly from their bureaucracies, which have a considerable direct influence on political processes as well (BIERMANN & SIEBERHÜNER, 2009).

In this regard, international organizations themselves also act as independent and autonomous international bureaucracies that may take missions and mandates not originally granted by their member states, setting new agendas, establishing rules and engendering responsiveness (BARNETT & FINNEMORE, 2004; BIERMANN & SIEBERHÜNER, 2009). Therefore, international organizations have an active role on the global stage through the action of an administrative apparatus formed by a hierarchical group of well-trained international civil servants (BAUER, ANDRESEN & BIERMANN, 2012).

The existence of international bureaucracies does not depend, however, on the constituency of formal international organizations, as they may be established by international treaties, as it is the case of the Secretariat of the UNFCCC (BUSCH, 2009). The distinctive character of international bureaucracies is their degree of permanence and coherence (BAUER *et al.*, 2009). However, new institutional arrangements do not always correspond to this assumption, as they are informally established, as it is notably the case of G20 and the BRICS. Furthermore, international bureaucracies are autonomous actors that exert authority over the global stage, precisely because they have an externally defined mandate and can count on independent financial and human resources that makes them not rely on a single national government to perform their duties. More than that, the authority of international bureaucracies also derives from the fact that they promote socially valued goals, as it is, for instance, the case of the protection

of environment. The main constrain on their action is the multilateral mechanisms of control, as they have to report their actions to some kind of executive body inside the organizational structure.

Precisely because international bureaucracies are autonomous agents, they exert influence, in the global governance, in three different manners (BARNETT & FINNEMORE, 2004; BAUER *et al.*, 2009). Firstly, international bureaucracies are knowledge-brokers in the sense that they gather information and produce scientific knowledge about a specific subject. Therefore, they create and disseminate knowledge, framing the definition of problems and changing belief systems. One key example was the definition of underdeveloped countries that, a few decades ago, was replaced in the UN jargon by developing countries. This kind of influence is particularly important in the global climate governance, where the scientific work developed by the IPCC has helped build consensus on the fact that human actions and the current economic model are key factors in aggravating climate change. Accordingly, international bureaucracies exert some kind of authority in legitimizing a specific understanding and in shaping global agenda, as it is the case of the 2030 Agenda.

The Secretariat of the UNFCCC, for instance, wield cognitive influence in the international climate regime. Its influence derives from the fact that the Secretariat of the Convention gathers all the information and data important for the implementation of the regime, facilitating the intergovernmental process and creating relevant outputs to the parties to the Convention. This influence may be limited in terms of shaping the global discourse and producing far-reaching concepts or scientific understandings, due to the very malign nature of the problem. Climate change is a very sensitive political issue and thus requires an attempt to be as neutral as possible by the part of the Secretariat (BUSCH, 2009).

ICAO Secretariat has also been acting as knowledge-broker in both technical aviation subjects and environmental matters. Since the inception of the environmental protection on the ICAO agenda, the Secretariat has been very active in producing documents, reports and publications on the environmental impact of civil aviation. In fact, the first IPCC special report on aviation and the global atmosphere was developed as a result of a request from ICAO (IPCC, 1999, p. 9). Furthermore, as it will be argued in the next sessions, the interaction between the Secretariats of ICAO and UNFCCC has prompted a close collaboration between those two bureaucracies and much of the information and data from the aviation sector was produced and provided by ICAO, which acted as leading institution in this issue (UNFCCC, 1999; UNFCCC, 2001; ICAO, 2008; ICAO, 2010b; UNFCCC, 2018).

Secondly, international bureaucracies act as negotiators facilitators, serving as a platform and setting the ground for states and other relevant actors to interact and to convene. In

this sense, they offer support as secretariats of meeting and conferences, and, in some cases, they determine the agenda and set the tone of discussions, or shape norm-building processes. Furthermore, they influence negotiations through ideas and expertise. As a consequence, international bureaucracies have a normative influence in shaping global cooperation.

In the case of the UNFCCC, the Secretariat is also responsible for facilitating, supporting and coordinating negotiations. In particular, the Secretariat plays a significant role in analyzing technical and methodological issues, preparing draft documentations and advising the presidency of the Conference of the Parties (COP) meeting. In fact, this normative influence has been pivotal in the overall activities of the Secretariat, even if it has not been able to autonomously influence in the negotiations process itself (BUSCH, 2009). ICAO has also been responsible for providing the primary forum for discussions and a platform for negotiation of any climate agreement for the aviation sector. In fact, ICAO was recognized as the main forum for advancing any climate agreement for the aviation sector (ICAO, 2008; UNFCCC, 2009; ICAO, 2010b).

Last but not least, the influence of international bureaucracies can be also measured by their relevance in acting as capacity-builders. In other words, as part of their mandates, international bureaucracies work with developing states and the least developed in the implementation of international norms and policies in their national territory. As a consequence, international bureaucracies influence the practical implementation of common solutions and harmonized policies on the ground. Although this capacity is very limited for the UNFCCC Secretariat (BUSCH, 2009), in the case of ICAO, this influence is especially important. The ICAO secretariat has been very active in providing capacity-building initiatives for member-states over the years not only in the technical issues, like safety and air navigation, but also in the environmental field (ICAO, 2016a). In this sense, the role of ICAO as an international organization with a strong bureaucracy will be further analyzed.

3.2. ICAO AS AN INTERNATIONAL BUREAUCRACY.

3.2.1. ICAO's structure and the principle of non-discrimination.

The International Civil Aviation Organization (ICAO) was created in 1944 by the Chicago Convention, as the primary international organization responsible for the regulation of air transport worldwide. The main goal of ICAO is to standardize norms and procedures related to safety, security, facilitation and air navigation of international civil aviation, and, as such, ICAO

has been served as a forum for debate in each of these areas (MACKENZIE, 2010). Furthermore, ICAO is also responsible for fostering the sound and orderly development of the sector, including airlines, airports and air navigation service providers, avoiding the adoption of any unfair or discriminatory measures (ROMERA, 2018).

ICAO is a product of the Post-Second War period and it was thus created to prompt the liberal order envisioned by the United States, one of the main architects of the Chicago Convention (HUANG, 2009). During the negotiations that resulted in the Chicago Convention, the focus of the initial organizing efforts was to deal with both technical and commercial regulations. Nevertheless, different positions were assumed by states, creating an Anglo-American standstill (MACKENZIE, 2010). On the one hand, the United States was eager to foster the development of the air transport activity and, therefore, it has fiercely advocated for reducing economic barriers and promoting the freedom of the air. At the bottom of the American stance, there was the interest of expanding the American aviation market worldwide. On the other hand, the United Kingdom opted for a more defensive approach, favoring an orderly and restricted development of air transportation. The British interests favored the creation of an international organization with major regulatory powers, including economic regulation (DEMPSEY, 1987).

At the end, the American position has dominated, albeit not entirely. At its very beginning, ICAO was supposed to be a technical regulatory agency aimed at reducing transactional costs for the development of the industry worldwide. Economic regulation though was left aside as commercial air services were to be negotiated in a bilateral basis (MACKENZIE, 2010). It goes without saying that, in the first decades of the ICAO existence, aviation safety was the *raison d'être* of the organization (HUANG, 2009). Under the Chicago Convention, each State was held responsible for safety oversight within its territory, and ICAO was focused on providing the basic legal framework for safe and secure operations worldwide.

ICAO consolidated itself as a technical organization whose main function was to resolve coordination problems. In this context, incentives were high for member-states to set their relations on the basis of generalized principles of conduct (RUGGIE, 1993; MARTIN, 1993). For all the technical matters related to civil aviation, ICAO has, as part of its mandate, the power to adopt and amend the so-called *Standards and Recommended Practices* (SARPs), which are internalized by member-states in their national regulations. The SARPs are consigned in the Annexes to the Chicago Convention, forming the primary source of the international air law (AHMAD, 2016). Although the Annexes do not have the same legally binding force as the Convention itself, they constitute a technical legislation that states voluntarily follow (WEBER, 2017).

Currently, there are 19 Annexes to the Convention, each of them dealing with a variety

of specific technical issues, from aeronautical charts, registration marks, rules of the air, to the investigation of accidents and security against acts of unlawful interference. Accomplishing standardization in those technical issues not only reduces transactional costs, but also increases efficiency and leads to better results. It should be highlighted that, so far, there is no Annex to the Chicago Convention dealing with economic regulation. As it is a much more sensitive issue, ICAO only issues guidelines on the matter, and all commercial services are negotiated in a bilateral basis (MACKENZIE, 2010; SALAZAR & FENEMA, 2017)

As a sectorial international organization, ICAO is closely linked to the United Nations system. Although it was created by an autonomous treaty, both organizations signed a special agreement in 1946, through which ICAO is recognized as a UN specialized agency. It has maintained, however, its financial and decision-making autonomy towards the UN. Initially signed by 52 states (HUANG, 2009), ICAO is currently one of the largest specialized agencies of the UN system, comprised by 192 member-states, all of them are also part of the UNFCCC.¹⁶

The institutional framework of ICAO is mainly composed by the Assembly and Council, both of which are supported by a robust Secretariat. The ICAO Assembly main responsibility is to review the work of the organization and to establish guidelines for future activities. It is also empowered to elect the Council and to review and adopt the recommendations referred to it by the Council. As the sovereign body, it can also deal with any matter within the sphere of action of the Organization not specifically assigned to the Council. Each of the member states has equal right to be represented at the meetings of the Assembly and is entitled to one equal vote (ICAO, 1944).

At the beginning of the ICAO functioning, the Assemblies were held annually. After the adoption of an amendment to the Chicago Convention in 1956, the ICAO Assemblies started to be convened every three years. Some authors (MILDE, 2012; PIERA, 2016) suggest that the modification to the frequency of the Assembly may have caused a profound change in the configuration of forces under ICAO. As the Assembly has a longer period between each of its sessions, its agenda has lost part of its strength to define the work of the organization, increasing, conversely, the power of the Council, a much more restricted body in terms of membership.

The ICAO Council, on the other hand, is the executive permanent body responsible to the Assembly, and whose participation is more limited. It comprises 36 member-states elected by the Assembly for a three-year term, according to criteria such as contribution to air transport and to the provision of facilities for international civil air navigation, as well as geographical

¹⁶ There are 197 signatory parties to the UNFCCC. Information available at: < https://treaties.un.org/Pages/ViewDetailsIII.aspx?src=IND&mtdsg_no=XXVII-7&chapter=27&Temp=mtdsg3&clang=_en>. Last access on Oct 4th 2018.

representation. Perhaps one of the most important functions of the ICAO Council is to adopt the Annexes to the Chicago Convention as well as any amendment to them. Precisely because of its rule-making power, the Council is a very strong and central body in ICAO structure. According to Romera (2018, p. 81),

The Council is the 'real power' within ICAO. Its legitimacy derives from the fact that its members include those with greatest interest in (and influence over) international civil aviation. In other words, its legitimacy is a product of its power in a specific domain.

The ICAO Secretariat is another important piece of the ICAO structure. This body was created to assist the ICAO Council in the performance of its duties, following established policies and developing periodic reports to the Council covering the progress of the Secretariat activities. The Secretariat is mainly divided into five bureaux: the Air Navigation Bureau, the Air Transport Bureau, the Technical Assistance Bureau, the Legal Bureau, and the Bureau of Administration and Services. Besides, it is assisted by seven regional offices, whose regional directors report directly to the Secretary-General.

Most of the 700 staff members¹⁷ of the ICAO Secretariat have some sort of technical background in aviation (PIERA, 2016). This varied expertise is important as the ICAO Secretariat performs different activities. As for safety and security issues, the Air Navigation Bureau and the Air Transport Bureau are responsible for compiling and making public information sent by members states regarding the level of compliance to the Annexes to the Chicago Convention. The Air Transport Bureau is also responsible for analyzing data from airlines and airport sent by states in order to develop statistics and forecast for the sector. In this regard, the ICAO Secretariat exert a great cognitive influence as knowledge brokers, using the concept developed by Barnett & Finnemore (2004), in the aviation system.¹⁸

When it comes to environmental issues, the Committee on Aviation Environmental Protection (CAEP) was created in 1983 to be the main technical advisory body on environmental protection issues under the ICAO structure. It superseded the Committee on Aircraft Noise and the Committee on Aircraft Engine Emissions, which were created a decade earlier. Composed by 24 members nominated by states, CAEP is divided into several working groups and task-forces responsible for dealing with all areas of aviation environmental protection from aeronautical noise to alternative fuels and emissions, including methodologies for allocating and estimating emissions, as well as modelling the impact of aviation on air quality and climate

¹⁷ United Nations Statistics Division. Directory of statistical services of international organizations. Available at: <<https://unstats.un.org/unsd/unsystem/docs/ICAO.pdf>>.

¹⁸ It would be an interesting to analyze how those different ICAO bureaux interact, compete and collaborate to each other. However, this is a topic for future research and it will be not scope of this dissertation.

change. More than 600 experts nominated by states, industry and non-governmental organizations contribute for the CAEP work, which greatly influence the response from ICAO on the environmental agenda (ICAO, 2016a; PIERA, 2016).

CAEP is the only technical committee directly linked to the Council, and it is mainly aimed at studying and developing proposals to minimize aviation's effects on the environment. Furthermore, CAEP assists the Council in formulating new policies and adopting SARPs related to aircraft noise and emissions, and more generally to aviation environmental impact. These efforts are accomplished through mechanisms that are technologically feasible, environmentally beneficial, and economically reasonable (ICAO, 2016a). Differently from other technical panels or committees, though, CAEP is not chaired by a member-state. The ICAO Secretariat, specifically the Environmental Division of the Air Transport Bureau, is responsible for assisting the CAEP work, helping set the agenda, organizing the meetings, developing reports and elaborating the summary of discussions of each meeting (PIERA, 2016).

3.2.1.1. The Chicago Convention and the enshrined principle of non-discrimination and equal and fair treatment.

The Chicago Convention is the foundation of the international air law and the international civil aviation regime (PIERA, 2016). Great part of the Convention focuses on the rules that states must follow in order to ensure a safe and orderly development of civil aviation. In this regard, it establishes the middle ground for a harmonization of air navigation procedures, as well as rules for registration of aircraft and flight operations. Moreover, the Convention also sets out that member states have the exclusive sovereignty over their air space above its territory, while also recognizing that, on the air space above international waters, the Chicago rules shall prevail (ICAO, 1944).

One of the paramount principles enshrined in the Convention and that guide all the ICAO rule-making process is the non-discrimination as well equal and fair treatment between air operators from member-states (ROMERA & ASSALT, 2015). The liberal rationale is already embedded in the regime established in Chicago, as one of its guiding principles is that the international air transport is to be based on “equality of opportunity and operated soundly and economically” (ICAO, 1944, p. 2).

In order to avoid discrimination, the Convention prohibits states from making any distinctions between national and foreign air carriers while enforcing their laws and regulations. Likewise, any charges cannot be distinct on the basis of nationality of the air operator. Those

principles are central to ICAO as well, as it should prevent economic waste caused by unreasonable competition and also avoid discrimination between contracting states.

The international regime settled by ICAO is largely based on the promotion of the industry's economic interests. ICAO is embedded in the liberal order based on free market principles and limited constraints on economic development of the sector. When establishing the common rules, practices or policies for operations, the rationale behind it is to have a fair play level field for stakeholders, regardless their nationality. It is not common under ICAO to agree with any differentiation between air carries or air services providers from developed or developing countries.

3.2.2. The configuration of forces within ICAO.

Although the overall representation at the ICAO Council changes every triennium, the members of Group I, which encompasses the states that are the largest contributors to the development of air transport, remain much the same at least since 2004, when China joined the group. As it can be seen in *Table 2.1.*, even before 2004, though, there were only minor changes to the configuration of this very selected group. Although the votes from all members of the Council are equal, being part of Group I means in practice having permanent seat and ensures the continuousness of representation. Therefore, given that the ICAO Council is the main decision-making body, its configuration is important to understand how issues are tackled under ICAO premises.

Table 2.1. Configuration of the ICAO Council from 1956 to 2019

Triennium	Group 1	Group 2	Group 3
2016-2019	Australia, Brazil, Canada, China, France, Germany, Italy, Japan, Russian Federation, United Kingdom, the United States.	Argentina, Colombia, Egypt, India, Ireland, Mexico, Nigeria, Saudi Arabia, Singapore, South Africa, Spain, Sweden.	Algeria, Cabo Verde, Congo, Cuba, Ecuador, Kenya, Malaysia, Panama, Republic of Korea, Turkey, United Arab Emirates, United Republic of Tanzania, Uruguay
2013-2016	Australia, Brazil, Canada, China, France, Germany, Italy, Japan, Russian Federation, United Kingdom, the United States.	Argentina, Egypt, India, Mexico, Nigeria, Norway, Portugal, Saudi Arabia, Singapore, South Africa, Spain, Venezuela	Bolivia, Burkina Faso, Cameroon, Chile, Dominican Republic, Indonesia, Kenya, Libya, Malaysia, Nicaragua, Poland, Republic of Korea, United Arab Emirates, Tanzania

2010-2013	Australia, Brazil, Canada, China, France, Germany, Italy, Japan, the Russian Federation, the United Kingdom, the United States	Argentina, Belgium, Colombia, Denmark, Egypt, India, Mexico, Nigeria, Saudi Arabia, Singapore, South Africa, Spain	Burkina Faso, Cameroon, Cuba, Guatemala, Malaysia, Morocco, Paraguay, Peru, the Republic of Korea, Slovenia, Swaziland, Uganda, the United Arab Emirates
2007-2010	Australia, Brazil, Canada, China, France, Germany, Italy, Japan, the Russian Federation, the United Kingdom, the United States	Argentina, Egypt, Iceland, India, Mexico, Nigeria, Saudi Arabia, Singapore, South Africa, Spain, Switzerland, Venezuela.	Cameroon, Dominican Republic, Ecuador, El Salvador, Ghana, Malaysia, Namibia, Republic of Korea, Romania, Tunisia, Uganda, United Arab Emirates, Uruguay.
2004-2007	Australia, Brazil, Canada, <u>China</u> , France, Germany, Italy, Japan, the Russian Federation, the United Kingdom, the United States	Argentina, Austria, Colombia, Egypt, Finland, India, Mexico, Nigeria, Saudi Arabia, Singapore, South Africa, Spain	Cameroon, Chile, Ethiopia, Ghana, Honduras, Hungary, Lebanon, Mozambique, Pakistan, Peru, Republic of Korea, Saint Lucia, Tunisia.
2001-2004	Australia, Brazil, Canada, France, Germany, Italy, Japan, the Russian Federation, the United Kingdom, the United States	Argentina, China, Egypt, India, Ireland, Mexico, Nigeria, Saudi Arabia, Spain, Sweden, Venezuela	Algeria, Cameroon, Costa Rica, Cuba, Czech Republic, Ethiopia, Lebanon, Mauritius, Pakistan, Paraguay, Republic of Korea, Senegal
1998-2001	Australia, Brazil, Canada, France, Germany, Italy, Japan, the Russian Federation, the United Kingdom, the United States	Argentina, China, Colombia, Egypt, India, Mexico, Netherlands, Nigeria, Norway, Saudi Arabia, Spain	Algeria, Botswana, Cameroon, Cuba, Indonesia, Kenya, Lebanon, Pakistan, Panama, Senegal, Slovakia, Uruguay
1995-1998	Australia, Brazil, Canada, France, Germany, Italy, Japan, the Russian Federation, the United Kingdom, the United States	Argentina, China, Denmark, Egypt, India, Mexico, Nigeria, Saudi Arabia, Spain Switzerland, Venezuela	Angola, Bolivia Cameroon, El Salvador, Indonesia, Kenya, Lebanon, Morocco, Pakistan, Romania, Senegal, Trinidad and Tobago
1992-1995	Australia, Brazil, Canada, France, Germany, Italy, Japan, the Russian Federation, the United Kingdom, the United States	Argentina, Belgium, China, Colombia, Egypt, Iceland, India, Mexico, Nigeria, Saudi Arabia, Spain	Cameroon, Czechoslovakia (to 31.12.92), Czech Republic (from 26.5.93), Ecuador Indonesia, Kenya, Lebanon, Morocco, Nicaragua, Pakistan, Senegal, Trinidad & Tobago, Tanzania
1989-1992	Australia, Brazil, Canada, France, Germany, Italy, Japan, the Union of Soviet Socialist Republics, the United Kingdom, the United States	Argentina, China, Egypt, Finland, India, Mexico, Netherlands, Nigeria, Saudi Arabia, Spain, Venezuela	Chile, Czechoslovakia, Ghana, Honduras, Indonesia, Iraq, Madagascar, Pakistan, Senegal, Trinidad & Tobago, Tunisia, Tanzania
1986-1989	Australia, Brazil, Canada, France, Germany, Italy, Japan, the Union of Soviet Socialist Republics, the United Kingdom, the United States	Argentina, China, Egypt, India, Mexico, Netherlands, Nigeria, Saudi Arabia, Spain, Sweden, Switzerland, Venezuela	Cuba, Czechoslovakia, Ghana, Indonesia, Iraq, Kenya, Pakistan, Panama, Peru, Senegal, Tunisia, Tanzania
1983-1986	Australia, Brazil, Canada, France, Germany, Italy, Japan, the Union of Soviet Socialist Republics, the United Kingdom, the United States	Argentina, Belgium, China, Egypt, India, Lebanon, Mexico, Nigeria, Norway, Spain, Venezuela	Algeria, Colombia, Czechoslovakia, Guatemala, Indonesia, Iraq, Jamaica, Kenya, Madagascar, Pakistan, Senegal, Tanzania

1980-1983	Australia, Brazil, Canada, France, Germany, Italy, Japan, the Union of Soviet Socialist Republics, the United Kingdom, the United States	Argentina, China, Denmark, Egypt, India, Lebanon, Mexico, Netherlands, Nigeria, Spain, Venezuela	Algeria, Colombia, Czechoslovakia, El Salvador, Indonesia, Iraq, Jamaica, Madagascar, Pakistan, Senegal, Uganda, Cameroon
1977-1980	Australia, Brazil, Canada, France, Germany, Italy, Japan, the Union of Soviet Socialist Republics, the United Kingdom, the United States	Argentina, China, Egypt, Finland, India, Lebanon, Mexico, Nigeria, Pakistan, Spain	Colombia, Czechoslovakia, Honduras, Indonesia, Jamaica, Madagascar, Morocco, Senegal, Tanzania, Yugoslavia
1974-1977	<u>Australia</u> , Brazil, Canada, France, Germany, Italy, Japan, the Union of Soviet Socialist Republics, the United Kingdom, the United States	Argentina, China, Czechoslovakia, Egypt, India, Lebanon, Mexico, Pakiusta, Spain, Sweden	Colombia, Costa Rica, Indonesia, Kenya, Madagascar, Morocco, Nigeria, Senegal, Trinidad and Tobago, Yugoslavia
1971-1974	Brazil, Canada, France, Germany, Italy, Japan, <u>Netherlands</u> , the Union of Soviet Socialist Republics, the United Kingdom, the United States	Argentina, Australia, Belgium, India, Lebanon, Mexico, Norway, Spain, United Arab Republic, Pakistan	Colombia, Congo, Czechoslovakia, Indonesia, Nicaragua, Nigeria, Senegal, Tunisia, Uganda, Trinidad and Tobago
1968-1971	Australia, Brazil, Canada, France, Germany, Japan United Kingdom, United States	Argentina, Belgium, Denmark, India, Lebanon, Mexico, Netherlands, Spain, United Arab Republic	Colombia, Congo, Czechoslovakia, Guatemala, Indonesia, Nigeria, Senegal, Tanzania, Tunisia
1965-1968	Australia, Brazil, Canada, France, Germany, <u>Sweden</u> , United Kingdom, United States	Argentina, Belgium, India, Japan, Lebanon, Mexico, Netherlands, Spain, United Arab Republic	Colombia, Congo, Costa Rica, Czechoslovakia, Kenya, Malagasy, Nigeria, Philippines, Tunisia
1962-1965	Australia, Brazil, Canada France, Italy, <u>Netherlands</u> , <u>Norway</u> , United Kingdom, United States	Argentina, Belgium, Germany, India, Japan, Lebanon, Mexico, Spain, United Arab Republic	Colombia, Congo, Indonesia, Malagasy, Nicaragua, Nigeria, Philippines, Tunisia, South Africa
1959-1962	Australia, Brazil, Canada, <u>Denmark</u> , France, <u>Netherlands</u> , United Kingdom, United States	Argentina, Germany, India, Italy, Japan, United Arab Republic, Venezuela	Guatemala, Lebanon, Philippines, Portugal, Spain, South Africa
¹⁹ 1956-1959	Australia, Brazil, Canada, <u>Denmark</u> , France, <u>Netherlands</u> , United Kingdom, United States	Argentina, Belgium, Egypt, India, Italy, Japan, Mexico	Ireland, Lebanon, Portugal, Spain, South Africa, Venezuela

Source: own elaboration based on data from ICAO, 2016c.

All the 11 states that are currently members of the Group 1 at the ICAO Council have a major participation in the global revenue generated from international air transport, ranking within the 28 largest shares of global *Revenue Tonne-Kilometer* (RTK),²⁰ a measure that quantifies the size of the international air transport of a country (*Table 2.2.*). According to data from ICAO (2017), China is already the largest international market in the world, more 12.2% of the global share, closely followed by the United States (11,47% of global share). From the Group

¹⁹ Before 1956, the elections to the ICAO Council were held by secret ballot and, therefore, states were not identified in separate groups.

²⁰ RTK stands for a standard industry metric used to quantify the amount of revenue generating payload carried, considering the distance flown. It comprises passengers, freight and mail multiplied by the distance.

I countries, Australia, Italy and Brazil are not in the top 15 largest international total RTK, each of them with less than 2% of the global share.

Table 2.2. International Total RTK in 2017

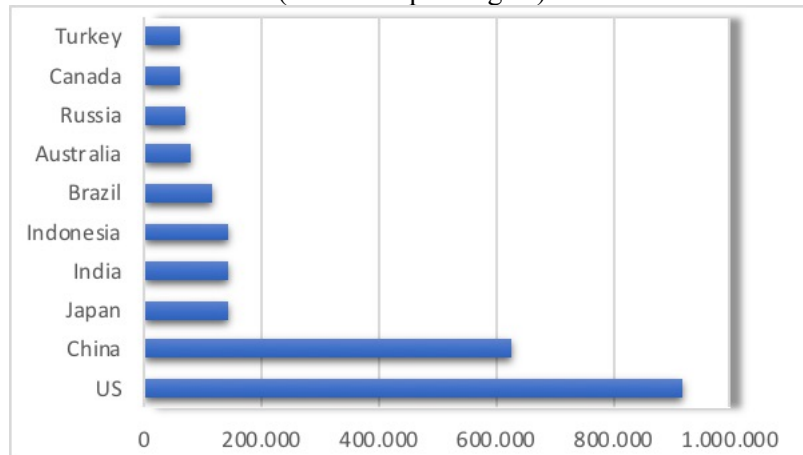
2017 International Total (Scheduled and Non-Scheduled) RTK ⁽¹⁾							
This table provides the international Revenue Tonne-kilometres (RTK) of ICAO Member States in 2017 with corresponding rankings (by international total RTKs - scheduled and non-scheduled)							
Ranking by State (RTK)	State	International Total RTK (million) (2017)	Share by State (%)	Cumulative Share (%)	SIDS ⁽³⁾	LDC ⁽⁴⁾	LLDC ⁽⁵⁾
1	China ⁽²⁾	84,559.6	12.20%	12.20%			
2	United States	79,491.7	11.47%	23.67%			
3	United Arab Emirates	56,220.5	8.11%	31.79%			
4	United Kingdom	39,803.2	5.74%	37.53%			
5	Germany	32,954.3	4.76%	42.29%			
6	Republic of Korea	25,101.5	3.62%	45.91%			
7	Qatar	24,077.0	3.47%	49.38%			
8	Turkey	21,209.1	3.06%	52.45%			
9	Russian Federation	19,730.0	2.85%	55.29%			
10	Singapore	19,617.8	2.83%	58.12%	Y		
11	France	19,233.8	2.78%	60.90%			
12	Japan	19,032.6	2.75%	63.65%			
13	Ireland	18,666.7	2.69%	66.34%			
14	Netherlands	18,246.9	2.63%	68.97%			
15	Canada	16,847.5	2.43%	71.40%			
16	Thailand	11,976.7	1.73%	73.13%			
17	Spain	11,048.1	1.59%	74.73%			
18	Australia	10,276.0	1.48%	76.21%			
19	Malaysia	9,410.5	1.36%	77.57%			
20	India	8,940.9	1.29%	78.86%			
21	Luxembourg	7,845.5	1.13%	79.99%			
22	Switzerland	7,150.8	1.03%	81.02%			
23	Saudi Arabia	5,804.9	0.84%	81.86%			
24	Ethiopia	5,725.8	0.83%	82.69%		Y	Y
25	Italy	5,499.6	0.79%	83.48%			
26	Philippines	5,432.1	0.78%	84.26%			
27	Mexico	4,949.5	0.71%	84.98%			
28	Brazil	4,856.9	0.70%	85.68%			
29	Norway	4,575.3	0.66%	86.34%			
30	Indonesia	4,303.9	0.62%	86.96%			
31	Belgium	4,094.5	0.59%	87.55%			
32	New Zealand	4,046.5	0.58%	88.14%			
33	Finland	3,723.0	0.54%	88.67%			
34	Portugal	3,652.7	0.53%	89.20%			
35	Hungary	3,596.6	0.52%	89.72%			
36	Israel	3,466.4	0.50%	90.22%			

Source: ICAO, 2017b.

If the domestic air transport is considered, 6 out of the 11 countries from Group 1 rank among the 10 largest domestic markets in the world (*Figure 2.1*). The US is still the largest market in this segment, but China is already in the second position. Japan, Brazil, Australia, Russia and Canada also have a significant domestic market in terms of passengers. Furthermore, 7 of those 11 countries that are members of Group I have a significant aeronautical industry,

composed by aircraft manufacturers²¹ and major international air carriers (*Table 2.3.*). Considering their airlines participation in the global market, the three largest airlines in the global share, in terms of carried passengers, are from the US and account for more than 15% of the global market. China biggest airlines, in turn, had a participation of 8.5% of the global share. As it can be seen, ICAO Council is dominated that the strongest players in the aviation sector.

Figure 2.1. 10 largest domestic market for air transport in 2017
(in million passengers)



Source: own elaboration based on data from Anna Aero, 2017.

Table 2.3. Largest air carriers by passengers up to June 2018

Airline	Country	RPK (in million)	Global share
American	United States	32,6	5%
United	United States	31,7	4,9%
Delta	United States	31,7	4,9%
Lufthansa Group	Germany	24,8	3,8%
AF-KLM	France and Netherlands	24,0	3,7%
IAG ²²	United Kingdom	23,4	3,6%
Emirates	United Arab Emirates	21,4	3,3%
China Southern	China	20,8	3,2%
Southwest	United States	18,8	2,9%
Air China	China	17,9	2,8%
China Eastern	China	16,4	2,5%
Ryanair	Ireland	15,5	2,4%

²¹ The largest aircraft manufacturers in the world in 2016 were Boeing (United States), Airbus (France), Embraer (Brazil) and Bombardier (Canada). Source: Statista. Available at: <<https://www.statista.com/statistics/269920/key-figures-of-the-four-largest-aircraft-manufacturers/>>.

²² International Airlines Group is the holding company of Aer Lingus, British Airlines, Iberia and Vueling. Source: IAG. Available at: <www.iairgroup.com>.

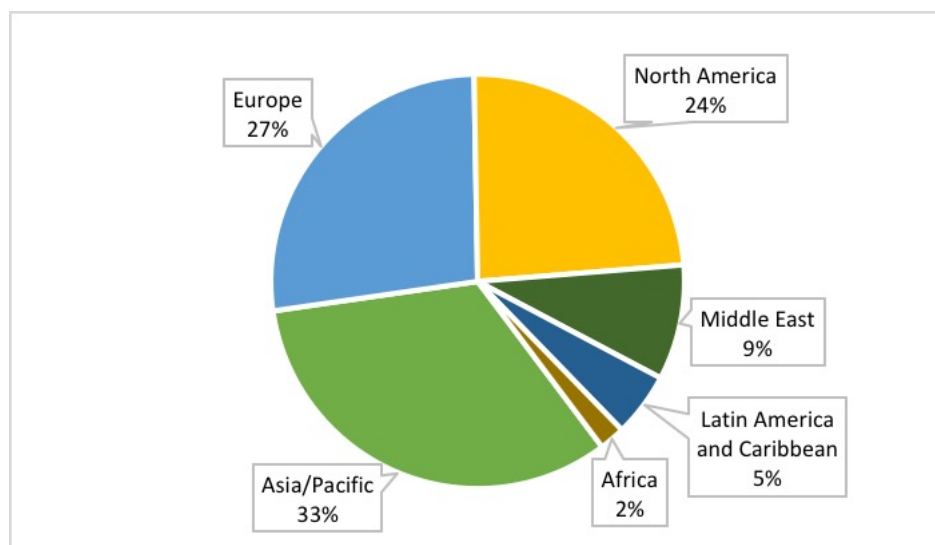
Turkish Airlines	Turkey	12,2	1,9%
Air Canada	Canada	11,4	1,8%
Singapore	Singapore	11,0	1,7%

Source: own elaboration based on data from ICAO, 2018.

There are different poles of power, with different capacities to influence the decision-making process in the ICAO Council. The first pole is the United States, one of the largest markets for both international and domestic air transport, which is home to one of the major aircraft manufacturers in the world – Boeing, and the state of registry of four out of the 15 largest airlines in the world. The second being Europe, with 4 out of 11 seats in the Group 1 of the ICAO Council. This overrepresentation comes from the fact that two of the major aircraft manufacturers are in Europe: Airbus and ATR, and the continent is still an important market for air transport even if it is relatively in decline (IATA, 2016f). The third major pole is China, which has overpassed the United States as the major air transport market in the world in terms of international demand (ICAO, 2017a) and it will probably be the largest domestic market by 2022, according to IATA’s (2016f) projections.

On the other hand, there is also an emerging power in ICAO that comes from the Middle East, Asia and Eastern Europe. United Arab Emirates, Qatar, Korea, Indonesia, Singapore and Turkey are fast-growing markets in terms of international and domestic demand. According to recent data published by ICAO (Figure 2), Asian and Pacific countries already have the largest global traffic share per passenger, leaving Europe and North America behind.

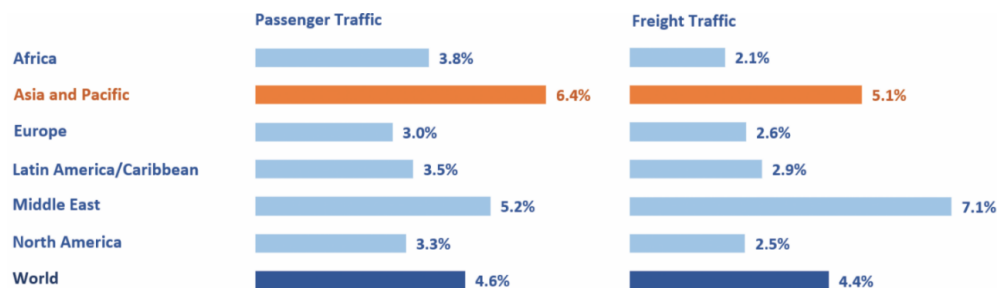
Figure 2.2. Share of the global traffic by region in 2016



Source: own elaboration based on data from ICAO, 2016r.

In fact, not only do those emerging markets rank in the 10 largest shares of the global RTK, but their growth projection is above the world's growth rate (*Figure 3*). The Pacific region and Asia along with the Middle East are shooting up the world's growth rate, and those markets are growing in a rapid pace. According to IATA's projections (IATA, 2016), half of the new passengers' demand over the next 20 years will come from Asia, especially China.

Figure 2.3. Projected Annual growth of total passenger and freight by region up to 2032.

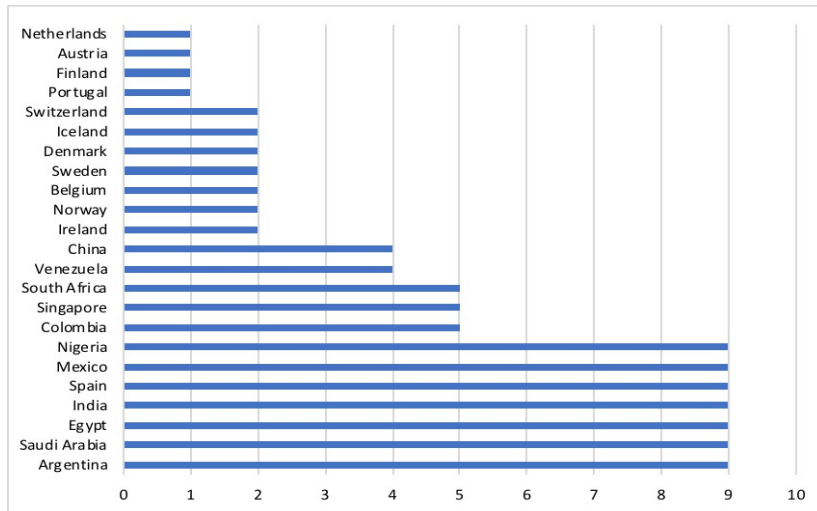


Source: ICAO, 2016b.

These emerging countries are not represented in the ICAO Council in the same basis as members from Group I though. Countries belonging to Groups II and III have to face a rotative participation with other countries in order to ensure geographic representation. Group II are those members that significantly contribute for the provision of facilities for international civil air navigation. From 1992 to 2016, the representation from Grupo II has not varied much. Argentina, Egypt, Spain and Nigeria have all been represented in this period, while there was a rotation between the other countries shown in *Figure 2.4*. From the new fast-growing markets, only Singapore, India and Saudi Arabia have been represented in Group II between 1992 to 2016 (*Figure 2.4*). India and Saudi Arabia were elected for all the 9 trienniums in this period. Group III countries are those elected to ensure adequate geographical representation. In this group, there is a much frequent rotation between those states (*Figure 2.5*).

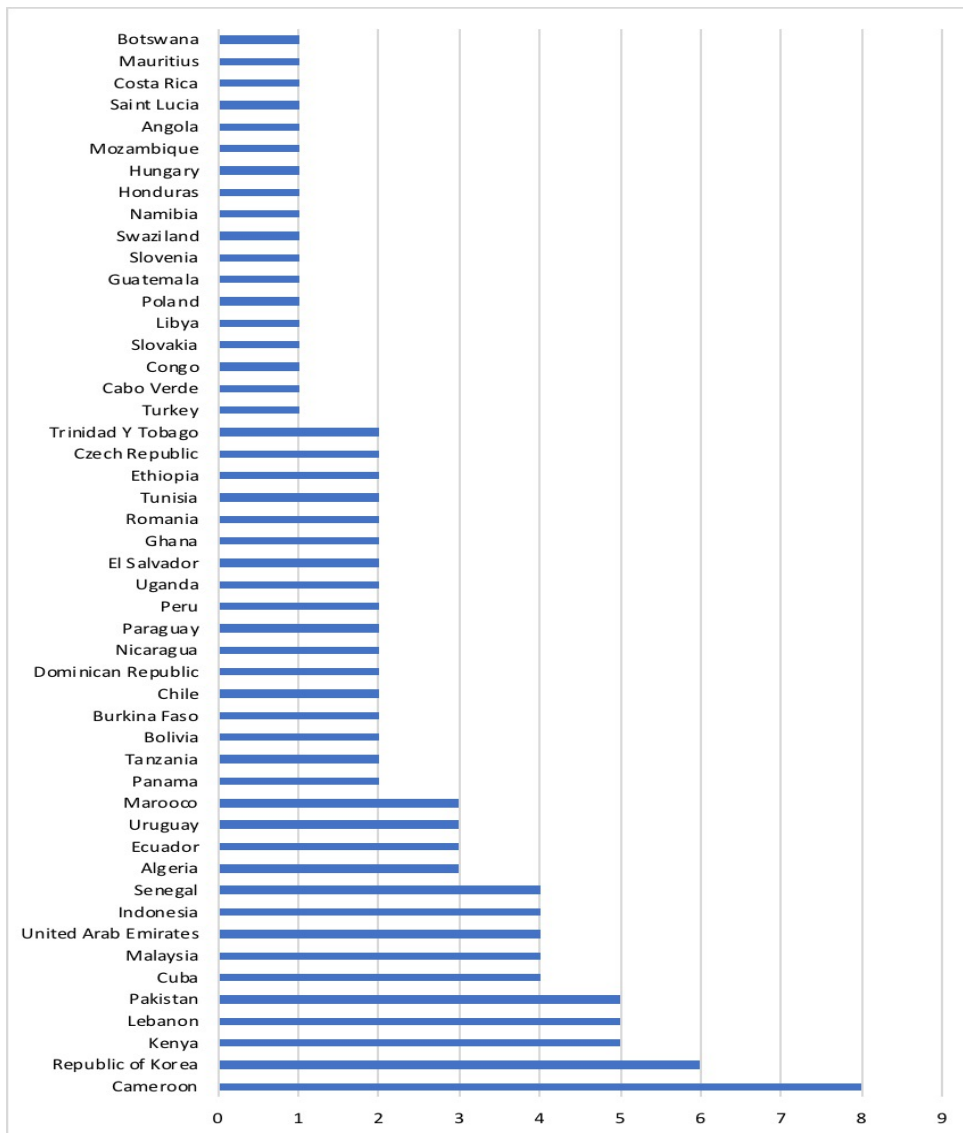
Figure 2.4. Representation in ICAO Group II from 1992 to 2016²³

²³ China only became a member of Group I in 2004; therefore, from 1992 to 2004, it was elected as member from Group II.



Source: own elaboration based on data from ICAO, 2016c.

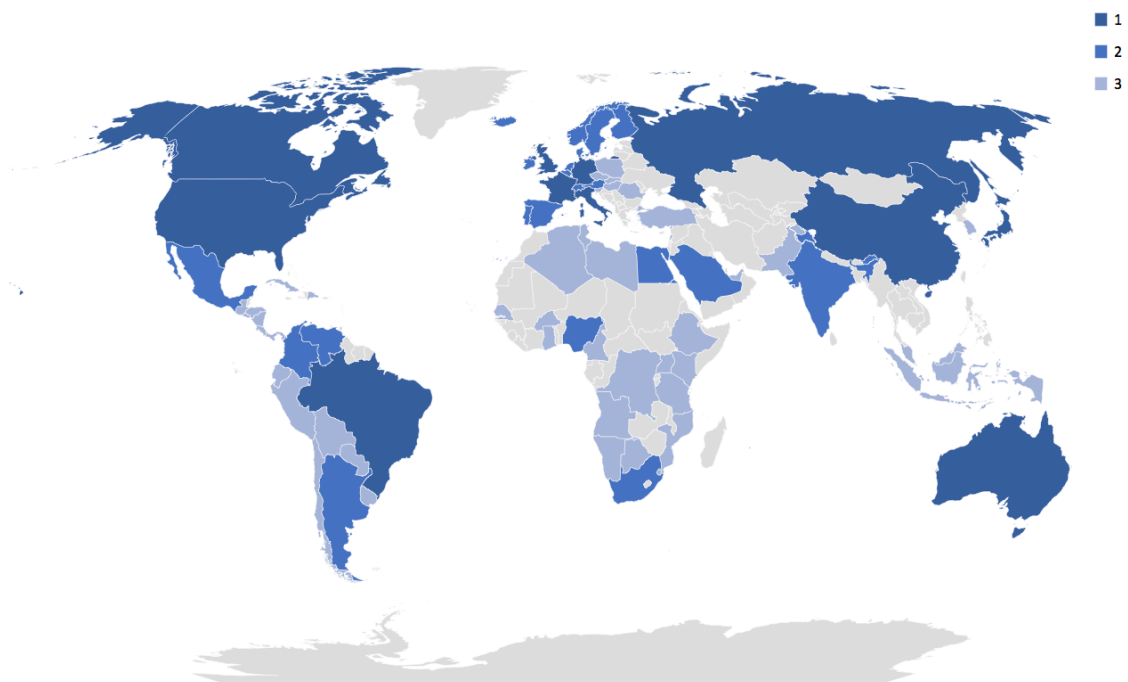
Figure 2.5. Representation in ICAO Group III from 1992 to 2016



Source: own elaboration based on data from ICAO, 2016c.

The configuration of power in the ICAO Council between 1992 and 2016 was highly concentrated in the countries with a consolidated market. All of the 11 Group I countries, Brazil and China are developing countries with a non-mature air transport sector. It can be argued that how countries stand out under ICAO's configuration does not follow the traditional cleavage between developed and developing countries. Rather, economic factors related to the market share of airlines and the growth rate of industry play an important role in defining their identity and interests in ICAO. This logic is particularly important if one considers that airlines and the industry are also important players under ICAO, with a decisive voice in discussions and in the decision-making process.

Figure 2.6. Representation in the ICAO Council between 1992 and 2016 according to Group I, II and III



Source: own elaboration based on data from ICAO, 2016c.

This research focuses its analysis on the working papers and position papers presented by the ICAO Secretariat and states during the Assemblies. Nevertheless, it is important to bear in mind that any ICAO document presented at the Assemblies is previously analyzed by the Council, where representation is restricted. Therefore, the Council works at a filter, playing an important role in defining the future agenda of ICAO. The reason why the papers and documentation of the ICAO Council was not analyzed in this research is that their access is not open to the public.

3.2.3. Non-state actors under ICAO.

Non-state actors have been playing an increasing and more active role in world politics, particularly in the global climate governance (BIERMANN & PATTBERG, 2012). The literature has focused its analysis on the participation of the so-called non-governmental organizations (NGOs) which, in practical terms, refer to any organization that does not have a state formal or legal status (RAUSTIALA, 2001). The term is more commonly used to represent both the private and voluntary interest groups, which usually means global corporations and civil society representatives. According to Gupta (2003, p. 456):

We are irrevocably leaving behind the notion that only nation states are authorized to participate in international governance. Instead, we are moving towards a different global system where problems are being addressed by various combinations and permutations of social actors at international and/or national level which may have to be implemented in countries at different levels of development.

Those NGOs participate actively in the activities that were previously dominated by states, which has transformed the process of international cooperation as a whole (GUPTA, 2003). Their influence can be perceived from the negotiation process to the monitoring and implementation stages of agreements. The broader influence of those organizations is possible because those non-state actors were granted with a seat and a voice, even if not necessarily a vote, at the main environmental forums, especially in the international climate regime. Whereas the UNFCCC was endorsed by states and is a product of states interests, non-state actors have been encouraged to also participate in its implementation (RAUSTIALA, 2001).

Although actors may not have a vote or decision-making power, they exert great influence in the so-called “corridor diplomacy”, lobbying state delegations and presenting proposals in those meetings. Green (2014) claims that non-state actors can actually influence the world politics as rule makers, and, as a consequence, they are a source of private authority. This authority can be either directly delegated by states or be entrepreneurial. The overall idea is that private actors are, in some cases, setting standards that are voluntarily adopted by other actors, changing behavior and having an impact on global governance.

In the same token, non-state actors also play a strategical role in monitoring the level of compliance by states, “naming and shaming” any disruptive behavior or providing capacity-building to help implementation (VILLA, 1999; WAGNER, 2002; RAUSTIALA, 2001; BARROS-PLATIAU, 2004). Ultimately, NGOs may provide more transparency and legitimacy to the global environmental governance, though this is not always the rule (RAUSTIALA, 1997).

In the case of private organizations, their participation in the global environmental governance is much more diverse. As many of the environmental problems have their origins in the economic model preconized by the private sector, global corporations are both the part of cause and the solution for tackling climate change issues and reducing the negative impact on the environment. Their previous stance of blocking any substantive progress in the global environmental governance has proven ineffective. In this sense, global corporations have agreed that some level of compromise is needed, and they have been playing a decisive role in implementing more sustainable and environmentally-friendly measures in the global level (TIENHAARA, ORSINI & FALKNER, 2012).

Global corporations are in the forefront of the technological development and they can invest heavily in new solutions to allow a more sustainable production and transportation of goods, if they are encouraged or constrained to do so. They also have organizational and institutional power not only to lobby their governments to adopt specific commitments but also to mobilize the financial resources to allow implementation in the national level (TIENHAARA, ORSINI & FALKNER, 2012). Furthermore, the private sector has been promoting voluntary initiatives of private regulation, such as certification and labelling schemes as well as voluntary principles. Such self-regulatory schemes are driven by the perceived need of the industry to manage environmental risk and avoid liability, protecting the company's reputation. They create a certain degree of responsibility on the industry, fostering new relations of production and consumption (GUPTA, 2003).

The non-state actors' influence in the global climate governance is not hierarchically equal though (RAUSTIALA, 1997). On the one hand, the configuration of power in non-state actors reflect, to some extent, the balance of power between states. NGOs from developed states, especially from liberal democracies, have more resources to participate in the global environmental governance (GUPTA, 2003) and they play the role of leaders, being overrepresented in other UN bodies as well (KECK & SIKKINK, 1998). On the other hand, even between the different categories of non-state actors, there is a major difference in their capacity to wield influence in world politics. Environmental organizations may be a source of information and knowledge, and may exert public pressure, but they usually lack the economic resources, the political position and organization capacity, all of which are enjoyed by global corporations (NASIRITOUSI *et al.*, 2014). This inequality in terms of capacity to influence the decision-making process is also reflected in the ICAO meetings.

Although the Chicago Convention sets forth that membership under ICAO is exclusive for states, non-state actors actively participate in the rule-making process of the Organization. Officially, ICAO does not consider the NGOs as observers, but they can be invited to attend

meetings. In fact, this non-formal status has not imposed any limit for their influence which has led some authors (PIERA, 2016; WEBER, 2017; ROMERA, 2018) to claim that there is a strong symbiosis between ICAO and some industry associations.

Currently, there are 46 NGOs already registered to attend ICAO meetings.²⁴ They represent a broad range of stakeholders from the civil aviation sector, from pilots and air traffic controllers associations to aircraft and aeronautical products manufactures, airlines and airports. They can attend high-level meetings, such as the Assembly and the Council, or technical panels and working groups, to discuss a variety of subjects. Ultimately, these non-state actors have access to relevant documentation, exchanging information with ICAO and influencing the rule-making process of drafting the SARPs (WEBER, 2017).

This broad participation of non-state actors in ICAO can be positive, as it allows for those who will be affected by the regulation to be consulted before rules are laid down. In practical terms, the rules under ICAO are more effective because all stakeholders can actively participate and propose viable and feasible solutions for common problems (PIERA, 2016). As technical matters are “coordination problems”, when an equilibrium solution is found, the incentives to comply are high and, thus, the effectiveness of the norms is more ensured (MARTIN, 1993).

On the environmental agenda, non-state actors are also part of the discussion that take place in CAEP meetings. In this regard, 6 out of 7 of those non-governmental organizations are from the private sector and represent the different stakeholders from the civil aviation sector.²⁵ Only one NGO representing environmental civil society groups is accredited to CAEP. For the purposes of this research, two non-state actors were chosen to be analyzed in depth – IATA and ICSA, representing respectively the industry and the environmental groups.

As CORSIA is a measure that will affect primarily airlines, the stance adopted by the Air Transport Association (IATA), which represents 290 airlines around the globe, may be an important indicator of the position taken by the industry. IATA is one of the longest-standing NGO representing airlines at ICAO meetings and technical groups. It was created in 1945 with the primary aim to cooperate with ICAO (ROMERA, 2018). It plays a pivotal political role in the sector (TIENHAARA, ORSINI & FALKNER, 2012) as it defines some of the rules and regulations followed by airlines.

²⁴ ICAO. Organizations able to be invited to ICAO meeting. Available at: < <https://www.icao.int/about-icao/Pages/Invited-Organizations.aspx#idIONonGov>>. Last access on 22 October 2018.

²⁵ The non-governmental organizations that can be invited to CAEP meetings represent aircraft manufacturers (ICCAIA), airports (ACI), airlines (IATA), business aviation (IBAC), air service providers (CANSO) and pilots (IFALPA). Information available at: <<https://www.icao.int/ENVIRONMENTAL-PROTECTION/Pages/CAEP.aspx>>. Last access on 4th Oct. 2018.

The influence of IATA, which dates from the adoption of the Chicago Conference, over the regulation of air transport is broadly recognized (HAANAPPEL, 2017; ROMERA, 2018). Although IATA represents the major airlines in the world that account for approximately 82% of total air traffic, the smaller, low-cost Airlines are not represented by IATA. Nevertheless, those airlines are increasing size-wise and in importance, particularly in Asia and Latin America (HAYER, 2016).

Basically, IATA provides three types of services for its affiliates. Firstly, it represents the industry and lobbies governments and regulators; secondly, it develops data analysis and statistics from the sector; and, finally, it provides support with products and expert services. For example, the system of allocating slots in the largest airports to airlines has been developed and implemented by IATA (ROMERA, 2018).

Moreover, IATA also acts like a private regulator as it performs safety and security audits in the airlines to verify, on a voluntary basis, their level of compliance and to assess the operational management and control systems of airlines. Those audits create a standard that is comparable on a world-wide basis, enabling and maximizing the joint use of audit reports, and labelling airlines according to their safety and security levels (IATA, 2017).

Concerning environmental protection, IATA has a wide range of activities. In fact, there is a department in the organization exclusively in charge of developing environmental policies and mechanisms. Besides the environmental department, IATA has also an Environmental Committee, composed by 20 environmental representatives from member airlines, whose main function is to advise IATA Board of Governors, Director General and other IATA bodies on environmental issues (IATA, 2018b). The activities of IATA in the environmental field are very diversified, and they include voluntary carbon offsetting schemes, sustainable alternative fuels, technology improvements, and fuel reporting and emissions database.

IATA has been very active not only in technical debates that take place in CAEP but also in more high-level ICAO meetings. In fact, industry position has been very decisive as airlines are mainly responsible for implementation of mitigation measures, and, therefore, the effectiveness of any response from ICAO relies ultimately on the acceptance of the private actors (HAYER, 2016).

When it comes to reducing GHG emissions from air transport, IATA has adopted an environmental strategy based on four pillars: (i) improved technology, including the use of sustainable low-carbon fuels; (ii) more efficient aircraft operations; (iii) infrastructure improvements; and (iv) market-based measures (IATA, 2018b). Its main focus is on developing environmental policies that promote sustainable and eco-efficient air transport, without imposing any additional burden into the economic growth of the sector. Moreover, IATA has fiercely

advocated for the establishment of a single global market-based measure to be adopted by ICAO, opposing the creation of regional or national trading schemes that could increase transactional costs for the industry (ROMERA, 2018).

The International Coalition for Sustainable Aviation (ICSA), in turn, is the only voice from the environmental groups in CAEP and has been very active in the ICAO high-level meetings. ICSA is a network of NGOs comprised by the Aviation Environment Federation (AEF), the International Council for Clean Transportation (ICCT), Transport and Environment (T&E), the Carbon Market Watch, the Environmental Defense Fund (EDF) and the Worldwide Fund for Nature (WWF). It is important to highlight that all of these groups are based either in Europe or in the United States. Therefore, there is no NGO representing environmental groups from developing countries in ICAO climate discussions.

As the only NGO from the environmental civil society groups accredited to attend CAEP and subsidiary bodies meetings, ICSA has contributed to the technical work to reduce emissions and noise, and also to develop a market-based measures to reduce emissions from the sector. The analysis of ICSA position may be a counterpoint to identify to what extent the concerns over the environmental integrity of CORSIA have been included in the final Resolution A39-03.

3.3. THE INTERNATIONAL CIVIL AVIATION CONTRIBUTION FOR CLIMATE CHANGE DAMAGES.

International air transport is one of the most fast-growing sectors and is a great contributor for the world economy. As a historical trend, the aviation sector double-sized every fifteen years, and even if it has already matured in some part of the worlds (i.e. Europe and North America), it is a booming market in Asia and Middle East (IATA, 2016f). In 2016, airlines worldwide carried around 3.8 billion passengers, whereas 53 million tons of freight were transported by air (ICAO, 2017f), representing 35% of all international trade (ATAG, 2018). The direct and indirect economic impact from the aviation industry as a whole is expected to have generated USD 2.7 trillion in revenue in 2017, which corresponds to approximately 3.6% of the world's gross domestic product. Furthermore, it has also created – or supported the creation of – a total of 65.5 million jobs worldwide (ATAG, 2018).

Along with those far-reaching benefits, it also comes some negative externalities from air transport that not only do they affect local communities in the vicinities of airports, but also

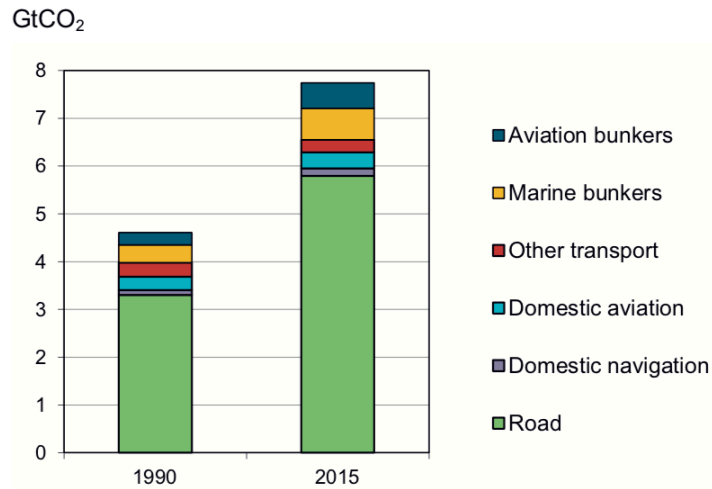
the environment as a whole. There are three main impacts caused by aviation: (i) noise disturbance; (ii) emission of pollutants that affect air quality; (iii) emission of GHG that affect the upper atmosphere.

Even though aeronautical noise was only inserted on the international agenda in the 1960's, it was the first environmental impact from aviation addressed by the international community. The issue was first discussed in 1966 at an international conference held in London, which gathered representatives from twenty-six states and eleven international non-governmental organizations from the industry sector (DALEY, 2016). The disturbance caused by aircraft operations in the areas near airports became a sensitive issue due to its impact on human health and welfare, as well as on fauna. According to Daley (2016), the nuisance caused by aircraft noise is one of the most significant local environmental impact from civil aviation. For these reasons, ICAO issued, in the early 1970's, the first Volume of Annex 16 on Environmental Protection, with the intention to set certification requirements on aircraft engines. As a consequence of those requirements on noise certification, technological improvements were incorporated into aircraft design, causing a dramatic decline in the levels of noise in the following decades (ICAO, 2016a).

Air transport is still very dependent on bunker fuels, a heavier and very much dense fuel extracted from crude oil, which makes it a high polluter in terms GHG and heavy gases that have a direct impact on air quality and human health (DALEY, 2016). Those gases are mainly oxides of nitrogen (NO_x), carbon monoxide (CO), unburned hydrocarbons (UHC), and smoke or non-volatile particulate matter (nvPM), which are emitted below 915 meters by aircraft themselves and by operations at the airports, as it is the case of ground service equipment (ICAO, 2016a). The impact of those gases on air quality and, in particular, the dark exhaust plumes of the early turbojet-powered aircraft were easily visible and caused concerns (local air pollution). As a consequence, in 1981, ICAO adopted stringent standards to three pollutants emitted by aircraft – CO, UHCs and NO_x –, through the edition of the second volume of Annex 16, which was applied to all in-production engines of aircraft (ICAO, 2016a).

Considering the polluters that affect the upper atmosphere and, as a consequence, the climate temperature, the air transport sector contributes to approximately 2% to 3% of the total anthropogenic carbon dioxide emissions (IPCC, 1999; ICAO, 2016a; ATAG, 2018) and about 13% of carbon dioxide emissions from all transportation sources (IPCC, 1999). These figures vary, of course, according to the source of information. According to IEA (2017), between 1990 and 2015, emissions from fuel aviation bunkers grew by 105%.

Figure 2.7. Share of emissions from different sectors

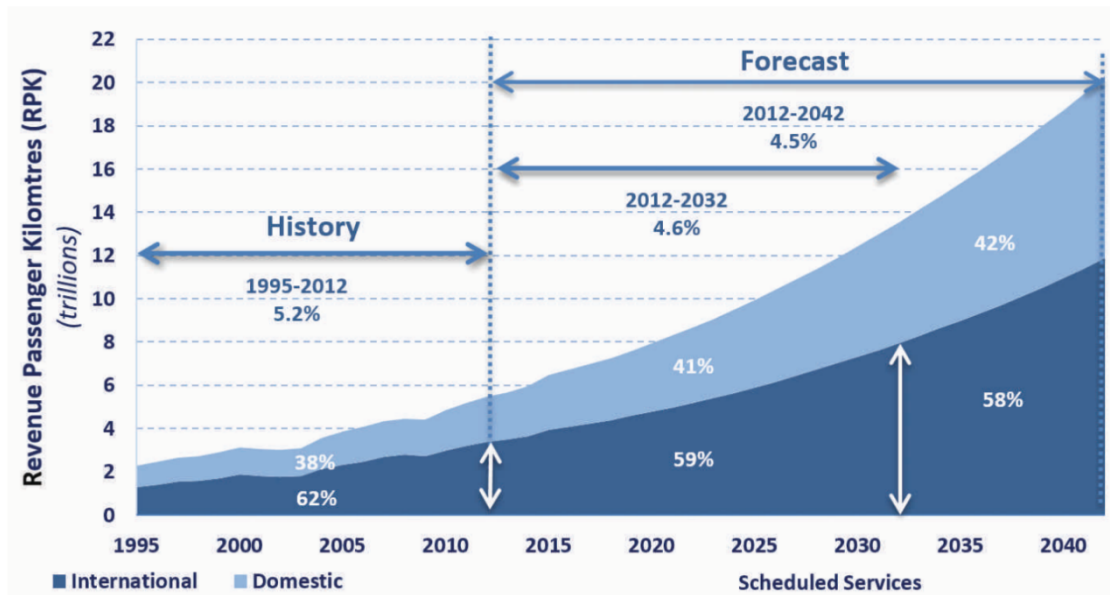


Source: IEA, 2017, p. 14.

The fact is that air transport is an important emitter of GHG and has significantly contributed to the anthropogenic increase of global temperature. Moreover, aircraft emit gases and particles directly into the upper troposphere and lower stratosphere where they have an impact on atmospheric composition as well. These gases and particles alter the concentration of atmospheric GHG, including carbon dioxide (CO₂), ozone (O₃), and methane (CH₄); they trigger the formation of condensation trails and cirrus cloudiness, which also contributes to climate change (IPCC, 1999).

The impact of air transport becomes even more problematic when one considers the different range of scenarios that projects an increase in emissions of GHG. According to IPCC (1999), by 2050, aviation emissions will have grown three-fold the 1992 levels. Those projections rely on the fact that the demand for air transport will continue to grow at an average rate of 4,5% in the following decades, almost doubling the current demand for passengers by 2034 (ICAO, 2016b). As a consequence, aviation fuel use and CO₂ emissions are projected to increase, despite the decrease of CO₂ per RPK due to technological and operational improvements (ICAO, 2016a). The most modern aircraft are about 70% more fuel efficient per passenger-km than jets produced 40 years ago (METZ *et al.*, 2007), and an annual fuel efficiency of 2.1% has been achieved by the industry between 2009 and 2016 (ATAG, 2018).

Figure 2.8. Total passenger traffic: history and forecast



Source: ICAO, 2016b, p. 11.

The impact of air transport on climate is predominantly global in their scope, given that the operations are intrinsically interconnected and thus aircraft emissions can affect the entire climate system over extended periods of time (SIMS & SCHAEFFER, 2014). According to Daley (2016), the regulation of CO₂ emissions stemming from international aviation imposes three main difficulties for policy-makers: (i) allocating emissions to specific countries; (ii) developing accurate and consistent emissions inventories; (iii) designing adequate and fair policy measures to curb emissions.

The UNFCCC has tried to address the first of those difficulties by identifying different options for the allocation of GHG emissions from international bunker fuels (UNFCCC, 1996, p. 11). Although the options were very diverse, no consensus was reached by the Parties to the Convention on the best way to allocate emissions from the aviation sector. This difficulty in allocation ultimately imposed constraints on developing an accurate and robust methodology for elaborating inventories on the international aviation sector emissions. Currently, there are two different methodologies for allocating GHG emissions from the aviation sector (ICAO, 2011). The IPCC methodology is based on the country of departure or arrival of the aircraft (option 5) whereas the ICAO methodology is based on the nationality or the place of business of the air operator (option 4).

Table 2.4. Options for allocating GHG emissions from bunker fuels

Option 1	No allocation to any specific country.
Option 2	Allocation of global bunker fuel sales and associated emissions to countries in proportion to their national emissions.
Option 3	Allocation according to the country where the bunker fuel is sold.
Option 4	Allocation according to the nationality of the aircraft operator.
Option 5	Allocation according to the country of destination or departure of an aircraft.
Option 6	Allocation according to the country of departure or destination of passengers or cargo.
Option 7	Allocation according to the country of origin of passengers or of the owner of cargo.
Option 8	Allocation to a country of all emissions generated in its national space.

Source: own elaboration based on data from DALEY (2010, p.77).

As most of the operational costs of airlines is related to fuel consumption (IATA, 2018a), there is a high incentive for the adoption of technological and operational approaches focused on achieving improvements in fuel efficiency. In this regard, the impact of aviation emissions can be reduced by changes in aircraft and engine technology, fuel efficiency, operational practices, and regulatory measures (IPCC, 1999). Nevertheless, the difficulty in establishing those measures, especially the regulatory ones, relies precisely on how to avoid discrimination between stakeholders from different countries.

When it comes to technological and operational improvements, though, it is important to consider the high range of safety and airworthiness requirements that all aircraft manufacturers have to comply with, in order to have the certification process approved. Besides, cost-benefit analysis are dominant considerations for the aviation industry when assessing any new aircraft purchase or potential engineering or operational changes. Technological development is mostly related to changes in the aerodynamics of the aircraft and engine, and they have already accounted for more than 80% of fuel efficiency improvement since 1960's (ICAO, 2016a). According to IPCC (1999), technological changes could result in up to 50% increase in fuel efficiency by 2050 compared to aircraft produced in the 1990's.

Operational measures, on the other hand, consist in improving air traffic management, increasing load-factor, optimizing aircraft speed, limiting the use of auxiliary power and promoting on-ground efficiency. In this last case, the measures include, for instance, the reduction of congestion at airports, the improvement of management of slots on gates, among others (ICAO, 2016a). Those operational options have the potential to reduce aviation fuel burn.

Finally, another inner solution that is also on the table, from a technical standpoint, and being an alternative to curb emissions from the aviation sector is the extensive use of sustainable alternative fuels. There are, nonetheless, two main drawbacks to this option. The first shortcoming is related to the fact that jet aircraft require fuel with a high energy density, especially for long-distance flights (IPCC, 1999). The second difficulty is the price gap between conventional fuels and biofuels for aviation (ICAO, 2016a). Those constraints hinder large-scale production and deployment of alternative fuels to aviation and, therefore, diminish the range of options available for reducing GHG emissions in the sector. It is worth mentioning, though, that there is some progress in this field, as alternative fuels are being produced and used, even if in a small scale, in the aviation sector already (ICAO, 2016a).

3.4. SETTING THE PRICE ON CARBON – ECONOMIC REGULATION AS AN ALTERNATIVE TO INCENTIVIZE A CARBON NEUTRAL GROWTH SECTOR.

When inner solutions such as technological improvements and extensive use of low-carbon fuels are not available or do not suffice to reduce emissions, economic regulations are a possible alternative. In fact, as it was argued in the first chapter, the current global climate governance has largely relied on market mechanisms to incentivize carbon emissions reduction from different sectors of the economy, consolidating the logic of liberal environmentalism (BERNSTEIN, 2001). In general, the literature points out that market-based measures motivate private firms to identify and exploit the more cost-effective ways to reduce their emissions (COASE, 1960; GODOY & SAES, 2015). The primary goal of market mechanisms is to achieve mitigation objectives at the lowest economic cost and at the highest social benefit (BRINER & HOOD, 2012).

One important characteristic of these market mechanisms is that they have been developed beyond traditional authorities (i.e. states), as many of the voluntary markets are created by private actors, leading to what literature defines as transnational environmental governance (BULKELEY *et al.*, 2012). As the authority of the states has become more diffuse and private actors (i.e. global corporations and non-governmental organizations) have acquired agency in

the global governance, a new phenomenon to address climate change emerged, which is the privatization of models of environmental governance.²⁶ In this sense, private actors have been actively engaging in voluntary and self-regulation schemes aimed at assisting those actors in complying with emissions reduction goals in a more cost-efficient way. By increasing participation of different stakeholders, transnational environmental governance helps promoting legitimacy and accountability of global environmental governance.

There are two main market-based mechanisms to set a price on carbon: (i) carbon levies; (ii) trading schemes (ALDY *et al.*, 2017). Carbon levies, such as taxes or charges, are the most direct way of establishing a price in emissions, either in the production or in the consumption of fossil fuels. In this case, GHG emissions are considered as negative externality of economic activity, which creates a difference between the marginal social and private cost of a good, affecting the socially optimal situation (WANG *et al.*, 2009). The result is that a levy is imposed by the government in order to diminish or alleviate the impact of this negative externality. The advantages related to the imposition of a carbon tax is that it makes the price of carbon more stable and predictable for stakeholders. In addition, a carbon tax generates revenues for the government, which can be invested in the development of new technologies, for instance (MURRAY, 2017).

Nonetheless, a carbon tax or charge does not necessarily lead to an efficient reduction of emissions nor it fosters a transition for a low-carbon matrix from the part of the private stakeholders. This transition will depend on the marginal cost of the abatement (POLLITT, 2015). In this sense, it does not ensure that a country will achieve a specific emission reduction target. Besides, government intervention may create market distortions between sectors and result in market failures due to corporate interests, lack of information and political pressure (COASE, 1960).

Emission trading schemes, in turn, are mechanisms by which the carbon prices are set through market forces (ALDY *et al.*, 2017). In other words, markets or government set the quantity of carbon to be emitted, and the price varies accordingly with demand and supply forces. In cap-and-trade systems, a limited number of tradable emission allowances is issued according to the emission limit that is settled by governments. Some of those allowances are distributed for free while others are auctioned using an agreed method. A market price for allowances is thus created, and this price varies as a function of the supply of allowances and the perceived abatement cost faced by entities covered by the cap (GODOY & SAES, 2015).

²⁶ Another phenomenon that has emerged is the increasing funding and innovation from the private sector (BRESLIN & NESADURAI, 2018). Nevertheless, it will not be further explored in this dissertation.

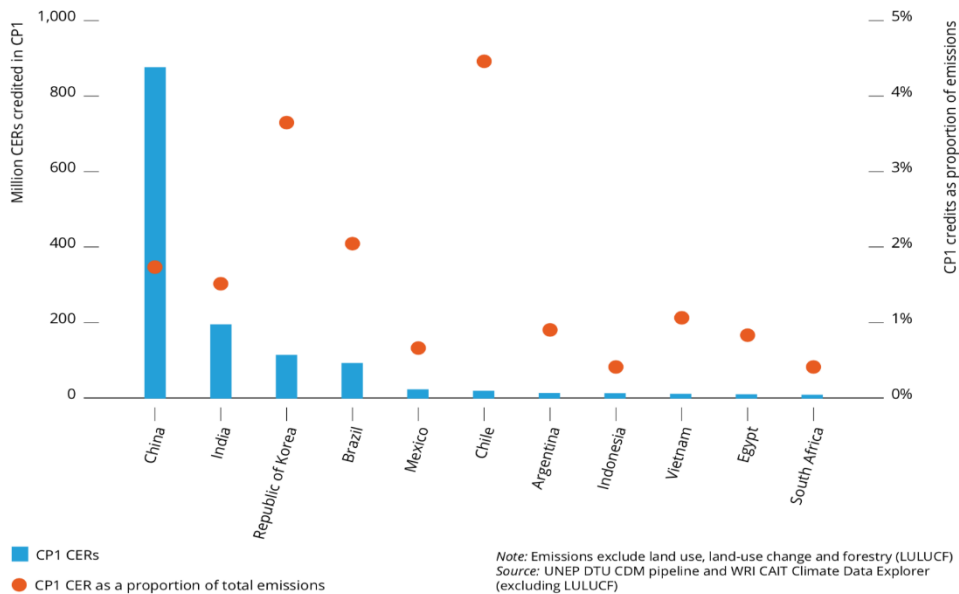
Offsetting mechanisms are based on the implementation of projects that actually represent an additional reduction of emissions compared to an agreed baseline. This emission reduction of CO₂ is transformed into emissions unit credits, which quantify the reductions achieved, and can be traded in the carbon market. Offsetting mechanisms, though, do not usually generate their own price signal and require a source of incentive in the demand for credits to be purchased (ALDY *et al.*, 2017). Differently from the cap-and-trade system, offsetting mechanisms are not based on explicit caps for carbon credit suppliers. Moreover, they require a robust system of monitoring, reporting and verification to ensure the integrity of the emissions unit credits generated by the projects, as there is no possibility of double issuance or claiming for those credits (BULKELEY *et al.*, 2012).

Those flexible mechanisms were established by the Kyoto Protocol as a means of ensuring compliance with the reduction goals of Annex I countries the most cost-efficient way (GODOY & SAES, 2015). Under the Kyoto framework, three flexibility mechanisms were created: (i) Joint Implementation Initiative (JI); (ii) Clean Development Mechanism (CDM); (iii) Trading Emissions Schemes (TES).

Project-based permits are derived from both the JI and the CDM. While the JI allows Annex I countries to trade offsetting credits between themselves, the CDM is an arrangement that incentivizes industrialized countries with mitigation commitments to invest in emission reduction projects in developing countries. The offsetting credits generated by those projects, called Certified Emission Reductions (CERs), can be used by Annex I countries to comply with their GHG reduction targets. CDM is thus based on the assumption that industrialized countries could achieve their GHG reduction goals by investing in offsetting projects in developing countries, where the differences in the level of technology could lower abatement costs (ZHANG & WANG, 2011).

In the first period of commitment under the Kyoto Protocol, from 2008 to 2012, the CDM issued 1.5 GtCO₂ of emission unit credits, which represented a global GHG emissions reduction of approximately 0.7%. The majority of those credits were generated by offsetting projects located in China, which became an important player in the carbon market.

Figure 2.9. Absolute and relative crediting of CERs in the first commitment period of the Kyoto Protocol.



Source: World Bank, 2017.

It goes without saying that some flaws have been identified in the methodology of CDM. Most of the criticism is related to the environmental integrity of some projects (SCHNEIDER, 2009; ZHANG & WANG, 2011), as there would be a lack of rigorous criteria to establish additionality. As a result, some projects are claiming more emissions reduction than they, in fact, represent. Moreover, the baseline is also a challenging issue, as in some cases there may be a lack of ambition in defining the baseline scenario, resulting, as a consequence, in an excess of credits in the market.

Concerning trading schemes, the literature usually claims that the European Trade Scheme (EU ETS) is a successful case (BRINER & HOOD, 2012; GONÇALVES, 2016; TUXEL, 2017). In 2003, it was established by Directive 2003/87/EC, contemplating 11,000 power stations and manufacturing plants in the EU member-states, in addition to Iceland, Liechtenstein and Norway. Regarding GHG emissions, the EU ETS regulates 45% of the emissions in the region. The EU ETS, nevertheless, is not exempted from criticism. From an environmental integrity standpoint, the effectiveness of ETS depends highly on the level of ambitious on establishing the cap.

Furthermore, as allowances are freely distributed to regulated sources based on pre-determined criterion, such as historic emissions, ETS may incentivize the establishment of a grandfathering regime. As a consequence, market distortions can be created (POLLITT, 2015).

Another setback from the ETS is the probability of carbon “leakage”. In this sense, tight regulations in the European countries may cause industrial activities to be transferred to other parts of the world where environmental regulations are less stringent. The problem of “emissions leakage” can ultimately revert the reductions in emissions achieved in the regulated sector (FOWLIE *et al.*, 2013).

As it will be further explored in the next chapter, the aviation sector has analyzed those market-based measures as part of the range of alternatives to respond to the international climate regime. The object of the next chapter will not be to identify whether the adoption of any of those economic regulations will be more effective or desirable in terms of environmental integrity. Rather, it will be argued that the aviation sector was not able to rely solely on inner solutions to reduce its emissions in the short and medium term and, as a consequence, it has adopted a market-based mechanism that consolidated in ICAO the consensus on liberal environmentalism. Nevertheless, the path for CORSIA has established a conflictive climate governance architecture between the main principles that guide ICAO and the UNFCCC.

4. REDEFINING GLOBAL CLIMATE GOVERNANCE IN ICAO – THE PATH TOWARDS A MULTILATERAL AGREEMENT TO CURB SECTORIAL GREENHOUSE GAS EMISSIONS FROM INTERNATIONAL AVIATION.

“So I believe this moment can be a turning point for the world. We've shown that the world has both the will and the ability to take on this challenge. It won't be easy. Progress won't always come quick. We cannot be complacent.”

Barack Obama.²⁷

The contribution of international civil aviation to the anthropogenic climate change is not negligible. The aircraft engine is an important source of GHG emissions and the impact of the aviation could not be left aside from the global efforts to address environmental problems. The intrinsic nature of the international transport, though, has induced the international climate regime to delegate the allocation and the control of the GHG emissions derived from the use of bunker fuels. The International Civil Aviation (ICAO) and the International Maritime Organization (IMO) were made responsible for regulating the emissions from those sectors as well.

In this chapter, it is argued that the mandate provided by the international climate regime has triggered an institutional interaction between the UNFCCC and ICAO that has ultimately created a conflictive climate governance architecture. The conflictive character of the climate governance architecture is derived mainly from the clash between the principles that oriented the international climate regime – the common but differentiated responsibilities (CBDR) – and the enshrined principles of the Chicago Convention – the non-discrimination and equal and fair treatment principles. In order to develop those arguments, the negotiation processes and the dynamics under ICAO will be divided into three main periods, in which the institutional interaction between UNFCCC and ICAO, as well as the position of the main actors, are highlighted. As the analysis of this dissertation is focused on the climate governance within ICAO and its institutional interaction with the UNFCCC, IMO is not object of any discussion or comparison.

The period from 1992 to 2007 entails the transfer of the negotiation process from the UNFCCC and the Kyoto Protocol to ICAO, in what can be called a “forum shopping”. As there were divergences on how to allocate the emissions from the international transport due to its inherent interconnectedness, a choice was made to delegate the negotiation mandate to ICAO, which added new dynamics and interests to the process. The logic of the climate regime was to

²⁷ Statement for the adoption of the Paris Agreement, during COP 20, 2015.

coordinate efforts and provide an effective response for the increase in the global temperature. Those concerns were not part of the ICAO agenda and, as a consequence, the main actors have acted based on the interests and the logic of the aviation sector. Therefore, in this first period, ICAO acted as a guardian of the economic interests of the sector and, under the climate regime, did not propose an adequate and ambitious response to limit or reduce the GHG emissions from international aviation.

In the second period, from 2007 to 2010, the conflictive architecture between UNFCCC and ICAO becomes more intense. As ICAO was unable to fulfill the mandate provided by the Kyoto Protocol, the prospect of a post-Kyoto regime establishing mitigation goals for the aviation sector became a source of pressure for ICAO. In this regard, the possibility that ICAO could lose its prerogative to negotiate a climate agreement and the aviation sector could be part of a much more comprehensive response prompted a more incisive and active role from ICAO. In addition, two other factors were crucial for ICAO moving forward on this agenda: (i) the possibility of a patchwork of different regional and fragmented responses for curbing emissions from the aviation sector; (ii) the early action taken by the industry, which voluntarily adopted more ambitious environmental goals. In fact, the response of ICAO on the climate regime is subsidiary of the industry's stance on the matter. Nevertheless, the aspirational goals and commitments achieved under ICAO were far from ambitious especially when compared to those goals proposed by the industry itself.

In the last period, from 2010 to 2016, ICAO finally prevailed as the primary organization to address the impact caused by the international air transport. As the Organization is a platform in which traditional actors (i.e. states) as well non-state actors (i.e. industry) have a great influence, the ultimate response from the aviation sector to the global efforts of the international climate regime was market-oriented and may have not imposed significant economic burden upon the development of industry. The Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) was designed in a close collaboration between ICAO and the industry, as an attempt to reconcile the CBDR and the non-discrimination principles.

In this regard, the position of the airlines, represented by IATA, as well as of Europe, China and the United States were chosen to be further analyzed because those actors were key during the negotiation process and have presented several position papers during the ICAO's Assemblies. This choice does not mean that other actors were not as relevant to the final outcome. In fact, there is a research opportunity to explore how the emerging economies from the Middle East and Asia have influenced the negotiation in this forum. In addition, the position of ICESA, the only representative from the environmental non-governmental groups, will also be presented as far as possible, as a counterpoint to the industry's position. The goal is to indicate

that the response from ICAO was primarily, if not exclusively, oriented by the market's interests, especially from the more consolidated and mature airlines, having the other non-state actors participate only marginally in this process.

Finally, CORSIA is further scrutinized in order to identify its main design elements and limits. As CORSIA is a market-based measure, it was developed to be the most cost-efficient response from the sector to the international climate regime. Notwithstanding the fact that CORSIA was designed in a way to reconcile the two core principles of both institutions – the UNFCCC and ICAO, it may have entailed the reversion of the logic of the CBDR, and also undermined the core principle of the Chicago Convention. As a result, some important market distortions between more mature airlines, on the one hand, and fast-growing and new entrants, on the other hand, may have been created.

It is worth mentioning that this chapter does not focus on the economic impact of CORSIA on the industry of different countries, or on the environmental integrity of this mechanism. Rather, the intention is to demonstrate how CORSIA is the ultimate consolidation of the logic of liberal environmentalism in ICAO, and precisely because it does not limit the economic development of the industry, it was an acceptable response for the ICAO member states.

4.1. THE CHOICE BETWEEN A FRAGMENTED OR A GLOBAL AND CENTRALIZED RESPONSE FROM THE SECTOR FOR THE INTERNATIONAL CLIMATE REGIME.

4.1.1. The inception of the climate change discussions on the ICAO's agenda.

4.1.1.1. The first period from 1992 and 2007: the emergence of the institutional interaction between ICAO and the UNFCCC.

Environmental concerns have been historically treated by ICAO from the strict point of view of the civil aviation impact on noise disturbances and local air quality in airports vicinities. Part of this restricted attention received by the environmental agenda under ICAO may derive from the fact that the Organization was mainly created to promote the standardization of technical norms and procedures of aviation (MACKENZIE, 2010; PIERA, 2016). In the Chicago Convention, there was not a direct mandate assigned for the Organization to deal with environmental matters (ICAO, 1944; PIERA, 2016; ROMERA, 2018). After all, the primary goal of the Chicago Convention was to achieve a system of uniform regulation of matters affecting international aviation (NYAMPONG, 2017).

This absence of environmental concerns in the early stages of ICAO is also a reflection of the fact that the protection of the environment was not a priority for the international community in a world order dominated by the logic of the Cold War (BARNETT & SIKKINK, 2008). As the environmental agenda was becoming more intense, though, the Organization had to adapt its structure to respond to new challenges. The first ICAO document to ever mention environmental issues was Resolution 16-03, adopted in 1968, in which States acknowledged that noise levels represented a serious problem for local communities near airports (ICAO, 1968). As a response to the convening of the UN Conference on Human Environment, ICAO also recognized the adverse effects of the aviation activity on the environment, especially related to air pollution (ICAO, 1971).

In this early stage of environmental discussions, the Organization claimed to itself the role of assisting its member-states on addressing the issue, as an attempt to avoid any external interference on the economic development of the sector. Since ICAO started to deal with this agenda, it became clear that economic goals had a precedence over environmental concerns (ICAO, 1971). In this regard, Resolution A22-12 clearly asked States to refrain from any unilateral actions that could have a negative impact on the economic development of the sector. Even acknowledging the negative externalities of the aviation industry for the environment in terms of pollution, ICAO members were reluctant in taking actions that could impose any constraint to the growth of the sector (ICAO, 1977, p. 53).

Nevertheless, it was not until the adoption of the UNFCCC that ICAO has promptly inserted the debate on the contribution of civil aviation for anthropogenic climate change on its agenda. The first time that ICAO ever stated that aviation could have an environmental impact on the upper atmosphere was at the 29th Assembly, held in 1992, right after the UN Conference on Environment and Development. At this point, two considerations were particularly important. Firstly, ICAO did not explicitly recognize that aviation was a contributor to GHG emissions, as it stated that more scientific research was needed to ascertain the extent of aviation contribution to climate change. And, secondly, ICAO claimed for itself the mandate to address this issue and to propose any policy guidance on possible means of minimizing any undesirable effect of international aviation on the environment (ICAO, 1992).

The industry, namely IATA, was a strong supporter of transferring any discussions on the aviation protection of the environment to ICAO (IATA, 1992). This strong support from IATA may have contributed to legitimize ICAO as the primary forum for discussions concerning any contribution from the aviation sector to the global effort of addressing GHG emissions. The main concern of the industry was that discussions in the international climate regime could

result in the imposition of limits for the economic development of the sector. In addition, consolidating ICAO as the main forum was an attempt to ensure that any response would be decided in a multilateral and coordinated manner, and not unilaterally. A patchwork of different regulatory regimes was the less preferred option as it would increase transactional costs for the industry and impose a constrain on the attempt to harmonize rules and procedures in the aviation sector (IATA, 1992).

The UNFCCC was broad enough not to impose any sort of compromise or goals for GHG reduction to any specific sector. It has only set the stage for states to take general actions and policies to reduce their emissions from all sources. The Kyoto Protocol, in turn, was adopted as a means to establish quantitative restrictions on emissions from industrialized economies, the so-called countries from Annex I. For these states, there was the goal of reducing 5,2% of GHG emissions between 2008-2012, having 1990 as the baseline (UN, 1998). The Kyoto Protocol, however, was undermined by the absence of the United States, the greater emitter of GHG at that time (ALDY & STAVINS, 2008).

As for the emissions from the international transportation sector, the Kyoto Protocol provided for a very clear negotiation mandate to ICAO (OBERTHÜR, 2003; OBERTHÜR, 2006; ROMERA, 2018), recognizing the Organization as the legitimate forum to pursue the limitation or reduction of GHG emissions from international aviation. As the sectorial organization for international air transport, ICAO should promote discussions and advance an agreement to curb emissions derived from the use of bunker fuels that were not controlled by the Montreal Protocol of 1987. In this regard, article 2(2) from the Kyoto Protocol established the following (UN, 1998, p. 3):

The Parties included in Annex I shall pursue limitation or reduction of emissions of greenhouse gases not controlled by the Montreal Protocol from aviation and marine bunker fuels, working through the International Civil Aviation Organization and the International Maritime Organization, respectively.

The literature usually points out that the mandate given by the Kyoto Protocol to ICAO may be credited to two main factors (OBERTHÜR, 2003; PIERA, 2016; AHMAD, 2017; ROMERA, 2018). Firstly, allocating GHG emissions from aviation to specific countries is inherently difficult, given the very nature of air operations (ICAO, 1998b; DALEY, 2010; GONÇALVES, 2016). A flight can start in one country with passengers from a variety of nationalities and have multiple destinations, with fuels uplift in all those landing points. Moreover, a flight can also start as a domestic one and, only after the second or third stop, it becomes international, and object of regulation by ICAO. In all of those cases, the question on how to allocate

those emissions emerges: should it be based on the country of registration of the aircraft, nationality of the passengers, place where the fuel was bought, amongst many other methodological options described in the previous Chapter (see *Table 3, Section 2.2.2.*).

Secondly, a consensus could not be reached among States on what actions would be required to reduce emissions from the aviation industry (OBERTHÜR, 2006; ROMERA, 2018). In the first stage of discussions, it was not evident how the aviation sector could curb its own emissions and to what extent inner solutions would be enough to provide a clear response for the international climate regime. As there was not in-depth scientific evidence on the actual contribution of the sector for GHG emissions, there was no sufficient knowledge on the range and level of ambition required from the international aviation. Neither was it clear how different stakeholders (i.e. airlines, aircraft manufacturers, air navigation providers and government institutions) could share their part in the overall effort to address this problem (ICAO, 1998b).

Those two aforementioned arguments can be found both in the literature on the subject (OBERTHÜR, 2006; ROMERA, 2018) and also in the official documents issued by ICAO. This research goes a step further to argue that climate discussions related to international air transport were transferred from the UNFCCC framework to ICAO in order to safeguard the economic interests of the industry. Under the Kyoto Protocol, only states from Annex I would have emissions reduction obligations. If any obligation or emission reduction goal was imposed under the Kyoto Protocol, only the aviation industry from developed countries and countries with economies in transition would be affected. Actions from developing countries would have to be voluntary, as they did not have any binding commitments under the Protocol. Therefore, it can be said that, in a highly competitive and strategic sector, such as the international transport, developed states may have been more reluctant to an agreement that would have excluded emerging economies, i.e. China, and because they would, in their view, lead to competitive distortions in the aviation industry.

In this case, discussions were transferred to another forum where market concerns were more preeminent and where the aviation industry, especially from the developed countries, could play a more active role in defining the final outcome. Not only has the Kyoto mandate resulted in a “forum shopping”, which worked in favor of the industry from more mature markets, but it also have provided for a conflictive governance architecture, in which a clash of principles was generated by the interaction of these two institutions: ICAO and the UNFCCC. ICAO was embedded in the logic that no differentiation could be made between airlines based on their nationality, reaffirming the principle of non-discrimination and equal and fair treatment enshrined in the Chicago Convention. However, the international climate regime consolidated

the idea that obligations to reduce emissions should consider the principle of CBDR and respective capabilities of developed and developing countries. During the first period of negotiations in ICAO, though, the logic of non-discrimination prevailed.

This institutional interaction between ICAO and the UNFCCC took place through the participation of their bureaucracies in their respective meetings (ICAO, 1998b; UNFCCC, 1999; ICAO, 2004b). The Conference of the Parties (COP) demanded that the UNFCCC Secretariat worked in close collaboration with the ICAO Secretariat in order to address emissions from international bunker fuels (UNFCCC, 1999). Under the UNFCCC structure, the ICAO Secretariat contributed to the work of the Subsidiary Body on Scientific and Technical Advice (SBSTA), through the participation in its annual meetings. The ICAO Secretariat has provided information and reports on the contribution of the aviation sector to the global GHG emissions, and also reported on the work in ICAO in providing a sectorial response to the international climate regime. In this regard, ICAO provided information on its activities in the emissions field, as a means of avoiding duplicative efforts and of facilitating exchanges of ideas on issues such as emissions trading schemes (ROMERA, 2018; ICAO, 2001b). In the same token, the UNFCCC Secretariat has been participating, from 2001 onwards, in the CAEP meetings, as an observer member (ICAO, 2001b).

Although the Kyoto mandate was clear in establishing the responsibility of allocating and controlling GHG emissions from bunker fuels to ICAO, in this early stage of interaction emphasis was given to the first part of the task. As a request from the SBSTA, ICAO cooperated in the joint exercise of improving both the quality of data on aviation emissions reported by Parties to the UNFCCC and the methodology upon which this reporting was based (ICAO, 1998b; UNFCCC, 1999; UNFCCC, 2001). The first question regarding the quality of the data was partly resolved by the strengthening of the cooperation between ICAO Secretariat and the IPCC. Following a request from ICAO, the IPCC issued a Special Report on Aviation and Global Atmosphere, in 1999. This report served as a basis for improving the following studies carried out by CAEP on modelling and estimating emissions from international aviation (ICAO, 1998c).

As for the methodologies for the allocation of GHG emissions from civil aviation among countries, as well as for differentiating between domestic and international flights, the interaction between the UNFCCC and ICAO was not so straightforward. As explained previously in the Chapter 2, the SBSTA discussed several methodologies for allocating emissions and they were narrowed down to two. Nevertheless, there was no consensus on the issue, and currently ICAO and the UNFCCC applied different methodologies. States report their domestic emissions under the UNFCCC inventories regardless the nationality of the air carrier. The important

information is whether the departure and arrival airports for a specific flight are in the same country or not (IPCC, 2006; DALEY, 2010). ICAO, on the other hand, takes into account the country of registration to determine where those emissions are to be allocated (ICAO, 2011).

Ever since it was demanded to take more active actions on climate issues, ICAO has limited its actions to the development of reports and studies on possible options that could limit or reduce emission from the sector without jeopardizing its economic growth (ICAO, 1998b; ICAO, 1998c; ICAO, 2001b; ICAO, 2004b; ICAO, 2004c). ICAO's position relied on the work developed by CAEP, which was mainly focused on three courses of measures: (i) technology and standards, including improved aircraft engine or airframe design (ICAO, 2004c); (ii) operational measures, such as more direct routings through satellite-based communication, navigation, surveillance and air traffic management systems (ICAO, 2004c); and (iii) market-based measures, including emission-related levies, voluntary offsetting mechanisms and emissions trading schemes (ICAO, 1998b; ICAO, 2001b; ICAO, 2004b).

Technological and operational improvements were given first priority in the set of viable measures to be undertaken by ICAO to reduce or limit emissions from air transport (ICAO, 2001a). As those measures work as positive incentives for the industry and do not necessarily require governmental regulation, they were more easily accepted by the different stakeholders involved. In fact, technological advances and operational measures were preferred as they improved fuel-efficiency, consequently being more cost-effective for the industry as a whole (ICAO, 2001b). The focus of this research is not on this set of measures and, thus, their contribution for the overall effort from the aviation sector will not be analyzed in this dissertation.

Market-based measures, on the other hand, were far more controversial under ICAO. Even if they are designed to achieve environmental goals at a lower cost and in a more flexible manner than traditional regulatory measures, they still impose a financial burden on the industry (ICAO, 2004b). As those measures are based on the principle of the polluter pays for the emissions that it generates, as enshrined in the Rio Declaration (UN, 1992, Principle 16), the costs of those measures are mainly, if not entirely, incurred by the airlines, in the aviation case (ICAO, 2001a). Moreover, the adoption of market-based measures has a great potential to create market distortions, if not properly designed, and, as such, the industry tried to influence, since the beginning of discussions, the design of any market-based measures for the sector (IATA, 1992; IATA, 2001; IATA, 2004a; IATA, 2004b).

The first market-based measure to be ever considered by ICAO was emissions-related levies, such as taxes or charges. CAEP studied the feasibility of adopting different kind of levies, namely fuel, ticket or route levy and airport levy (ICAO, 1998b). Although fuel levies were proved to be more effective in terms of reducing fuel consumption and, therefore, global overall

emissions, the imposition of this type of tax raised legal concerns, as most bilateral services agreements had clauses exempting fuel used in international operations from any tax. Furthermore, fuel taxes could be imposed in different ways and by different policies by member-states, creating significant distortions worldwide (ICAO, 1998b). The other three types of levies were deemed less efficient from the environmental standpoint, and in some cases had only local impact, as was the case of the airport levies (ICAO, 2004b).

Against the possibility of the international climate regime taking on the task of ICAO in proposing measures to reduce emissions from aviation, the ICAO Council had to take a stand on the matter. It rejected any unilateral action to introduce taxes on air transport as an emission reduction option, a position that was reinforced in different assemblies (ICAO, 2001a; ICAO, 2004a). Nevertheless, if emissions-related levies were to be imposed, charges are the preferred option, under the following principles: they should not be used for fiscal purposes, they should not create competitive distortions in relation to other modes of transportation, they should not disincentivize the efficient use of aircraft capacity and they should be cost-related (ICAO, 1998b).

The ICAO's conclusion on the imposition of levies echoed the industry's position on this matter as well. The industry was reticent in accepting the establishment of taxes on fuel emissions, as it would increase costs of operations and could generate competitiveness distortions not only between air operators from different countries, but also between the aviation sector and other transportation modes (IATA, 1992). In this regard, IATA has, since the beginning, strongly advocated that any ICAO policy or agreement on environment protection should safeguard the industry from competitive distortion, while also avoiding the imposition of constraints on the economic growth of the sector. Furthermore, for the industry, emphasis should be placed on the adoption of more efficient operational measures and on the funding of technological improvements, as it would include efforts from the airlines and other non-state actors, and also require governmental policies (IATA, 2001).

In this early stage of discussions, European countries were a dissident voice. Under the assumption that aviation should be treated on the same of other fuel consumption industries, the European countries were in favor of the imposition of environmental levies to air operators. It was their view that costs should be internalized by the operator and paid by the users of the service, in accordance with the principle of the polluter pays for its emissions. It was ICAO's role to develop the appropriate framework for the implementation of an environmental levy for the sector (ICAO, 1998d; ICAO, 1998e). In the same token, ICSA has very fiercely urged ICAO to establish a CO₂ mitigation target consistent with the Kyoto Protocol, by the introduction of a market-based measure, which could be either a charge or a Kyoto mechanism. ICSA

went a step further and suggested that if ICAO was unable to achieve a compromise, the discussions should be transferred to the UNFCCC framework (ICSA, 2001).

It is important to mention that Europe is overrepresented both in the ICAO Council and in CAEP. When European countries express their positions, they do so as a result of a coordination effort of each European state represented in the ICAO bodies. Besides the participation of the individual contracting states, the European Union – EU (or the European Community – EC, before the Lisbon Treaty) and the European Civil Aviation Conference (ECAC) are also represented and act as observer members in the meetings. Therefore, when Europe takes a stance in different ICAO bodies, its voice is certainly heard. And during this first period of negotiations under ICAO, the more active actors during the Assemblies were Europe (either EU/EC or ECAC), IATA and to a much less extent ICSA. China and the United States were not as participative, and did not present any position paper between 1992 and 2007.

In a more detailed study presented at the 35th Assembly, the ICAO Council concluded that there was no evidence that emissions related-charges were an appropriate response from the sector for the international climate regime (ICAO, 2004b). Concerns were raised on the fact that the implementation of charges on CO₂ emissions could entail adverse and distortive effects for the industry, especially in developing countries, diminishing the benefits derived from air transport and increasing costs for airlines (ICAO, 2004d; ICAO, 2004e; IATA, 2004a; IATA, 2004b). Furthermore, ICAO raised the question on whether charges related to CO₂ emissions would, in fact, address the global environmental problem of climate change, given that there was no guarantee that the funds collected would be reverted for environmental purposes (ICAO, 2004b).

Another important problem identified during this first phase was that the Chicago Convention and other ICAO policies clearly disincentivize the imposition of taxes on the international air transport, preferring the adoption of charges, which are usually related to costs incurred in the provision of a facility or a service. In this regard, CO₂ emissions charges do not meet the criteria of having to be based on the costs of mitigating the environmental impact of aircraft engine emissions “to the extent that such costs can be properly identified and directly attributed to air transport” (ICAO, 2004b, p. 4).

From 2001 onwards, market-based measures, in particular emissions trading schemes and offsetting mechanisms, were given further consideration by CAEP as possible and viable means of reducing environmental impact of aircraft engine emissions. However, in the Assemblies held in 2001 and in 2004, ICAO’s response was very restrictive in only supporting volun-

tary mechanisms to be adopted either by the solely initiative of the industry or by mutual agreement between industry and governments (ICAO, 2001a; ICAO, 2004a).

As for the trading emissions schemes, two approaches were set forward. The first was the endorsement of ICAO on the development of an open and voluntary emissions trading scheme for the aviation sector. The second was the agreement that ICAO should define guidance on how states could incorporate emissions from the aviation sector into their own emissions trading schemes in a manner consistent with the UNFCCC framework. This latter approach was a response to the European environmental policy regarding the establishment of the European Emissions Trading Scheme – *EU ETS* (ICAO, 2004a; OBERTHUR, 2006; GONÇALVES, 2016; TRUXAL, 2017; ROMERA, 2018).

The fact is that, between 1992 and 2007, few actions were taken by ICAO to address the environmental impact caused by international aviation. Although ICAO has claimed to itself the primary role to deal with any matters related to the aviation sector, it was unable to reach a consensus on any policy guidance or more incisive commitment to reduce or limit emissions of GHG. Neither operational and technological measures nor the imposition of charges were effectively put forward by the Organization, as no reduction target or mitigation commitment was adopted.

The laggard position of ICAO may be explained by the prevalence of the principles enshrined in the Chicago Convention, namely non-discrimination principle and equal treatment, over the mandate provided by the international climate regime. The policies of the Organization were directed to not impose any burden on the economic development of the sector (ICAO, 1998b). As the Kyoto Protocol was in jeopardy of not being adopted by the absence of the major emitter – the United States, it helped discussions under ICAO move in a much slower pace as well (ICAO, 2004b).

4.1.1.2. The second period from 2007 to 2010: the consolidation of the conflictive climate governance architecture.

The conflictive climate governance architecture became more evident between 2007 and 2010, when the path towards the adoption of any response by the aviation sector was strongly influenced by the UNFCCC process. In this period, three main factors impacted on the negotiation process under ICAO. The first factor was that, in order to move forward with the climate agenda, ICAO recognized the CBDR as a guiding principle of the negotiation of a climate agreement, creating the challenge of reconciling this principle with the non-discrimination and equal and fair treatment. The second factor was that the prospect that a post-Kyoto regime

could establish goals and commitments to the aviation sector and remove the negotiation mandate from ICAO. The third factor was the adoption of ambitious goals by the industry itself as a response to the possibility of the inclusion of the international aviation in the EU ETS, and as a way of exercising influence in the negotiation process at ICAO.

In the first stage of negotiations, ICAO was very reluctant to insert the principle of the UNFCCC framework into the discussions on climate change. Between 1992 and 2007, there was no mention to the CBDR principle in any of the resolutions approved at the Assemblies. The only distinction made was that any alternative should take in consideration the potential implication for developed as well developing countries. (ICAO, 1992; ICAO, 1995a; ICAO, 1998a; ICAO 2001a; ICAO 2004a). The turning point was in 2007, when, for the first time, the Resolution A36-22 explicitly mentioned both the principles – CBDR as well as non-discrimination and equal and fair opportunities – as the basis for the further development of the climate agenda. They became guiding principles for the institutional interaction between ICAO and the UN bodies (ICAO, 2007a, Appendix J), for the analysis of the policy options on climate change (ICAO, 2007a, Appendix K) as well for the development of any market-based measures for the aviation sector (ICAO, 2007a, Appendix L). Nevertheless, the recognition of the CBDR principle was very restricted as there was no clear or incisive indication on how obligations would differ between developed and developing countries in a possible MBM scheme.

Certainly, there were different understandings on how the CBDR would be implemented under the ICAO framework. On the one hand, there was the position from some countries that the mandate provided by Kyoto was very clear in stating that only countries from Annex I should agree on measures to reduce GHG emissions from the use of bunker fuels. In this regard, China has very fiercely advocated that the countries not included in Annex I should not be imposed with any obligation in a possible ETS for the aviation sector (ICAO, 2007g). At its core, China's position was based on the assumption that addressing aviation emissions was not merely an environmental issue, as it was first and foremost a development issue. Developing countries should have the right to foster their infancy industry just like the developed countries have done in the early stages of their aeronautical industry. Besides, developed countries should take the lead in addressing climate change and its adverse impact, and they should also provide support to developing countries in order to strengthen their capacity to address climate change (ICAO, 2007g; ICAO, 2010d). China went on to propose that the development of international air transport should be the first priority in ICAO. China's position regarding the CBDR as a guiding principle for any ICAO initiative on climate change was, in different degrees, supported by other countries as well, mainly by African countries (ICAO, 2007h) and the Latin-American region (ICAO, 2007d).

Europe and the United States, on the other hand, did not explicitly oppose to the recognition of the CBDR principle during this period (ICAO, 2007e; ICAO, 2007i; ICAO, 2010c). The possible reason for this more low-profile stance is that, at this point, it was not clear what kind of measure ICAO would adopt. It was obvious, though, the need to avoid any nationality discrimination among carriers. In this context, the United States, along with Canada and Mexico, proposed a set of guiding principles for the development of any market-based measure for the aviation sector (ICAO, 2010f), which were incorporated in the final text of Resolution A37-19 (ICAO, 2010a). One of these principles was that the adoption of an MBM under ICAO should avoid significant market distortions and respect non-discrimination among operators (ICAO, 2010e).

As the prospects of a post-Kyoto agreement that would include all relevant economic sectors were more eminent, ICAO took some steps in order to provide a response for the international climate regime. The Bali Roadmap was launched at the COP/13, in December 2007, and it had as one of its main objectives to establish the terms and the conditions for the adoption of a future climate agreement beyond 2012, to replace the Kyoto Protocol (CRISTOFF, 2008; UNDP, 2008). The intention was to set the ground for negotiations on more ambitious mitigation efforts for both developed and developing countries, even if based on their respective capabilities and considering their historical contribution to the anthropogenic climate change (CHRISTOFF, 2008; WATANABE *et al*, 2008). The issue on how to address GHG emissions from international air transport raised rather contentious discussions within the UNFCCC negotiating process (ICAO, 2009a; ICAO, 2009b).

In this regard, in the 37th ICAO Assembly, which took place in the end of 2007, the Group on International Aviation and Climate Change (GIACC) was established in order to develop recommendations on an ambitious program of action to address GHG emissions. Comprised of experts nominated by developed and developing countries on an equal proportion, the Group should work on this program of action to be presented at a high-level meeting, which was to be convened in 2009, prior to the COP/15, and as direct response to the UNFCCC process (ICAO, 2007a; ICAO, 2009a; ICAO, 2009b).

This program of action should guide ICAO in three main courses of actions (ICAO, 2007a). The first was the adoption of aspirational goals particularly related to fuel efficiency. The second was the implementation of a framework consisting of economically efficient and technologically feasible measures to limit GHG emissions from the international transport, which could include voluntary initiatives, technological and operational measures, positive economic incentives and market-based measures. And, finally, this program of action should es-

establish the means to measure progress and to support developing countries for their implementation (ICAO, 2007a).

The work of GIACC was of paramount importance to prevent the UNFCCC from taking on the ICAO's mandate for the negotiation of an agreement (ICAO, 2009a; ICAO, 2009f; ICAO, 2010b). From 2007 to 2009, the Group focused its work upon three key issues: (i) feasibility of more ambitious medium and long-term goals for the aviation sector; (ii) proposals for strategies and measures to achieve emissions reduction; (iii) measures to assist developing states to facilitate access to financial resources, technology transfer and capacity building. The recommendations of GIACC were adopted in the High-Level Meeting (HLM) on Aviation and the Environment held in 2009 and were the basis of the position presented by ICAO at COP 15, in Copenhagen (ICAO, 2009f; UNFCCC, 2009).

Although Kyoto had excluded GHG emissions from international aviation from the range of reduction commitments, the inaction of ICAO to provide a proper response on the matter reopened the debate under the international climate regime in the COP/15, in 2009 (EC, 2009). The UNFCCC discussed several aspects on how to address civil aviation emissions, including goals and baselines, guiding principles and means of implementation. European countries presented proposals on how to establish market-based measures for the aviation sector, either through the imposition of levies or the inclusion of aviation in an emission trading scheme. More than that, emissions reductions goals for the aviation sector were mentioned in the European paper presented under the Bali Action Plan process, even if no precise goal was mentioned. Proposals included establishing an independent legally binding agreement or agreeing on a global cap on those emissions (EC, 2009).

Even if, at the end, the Copenhagen Accord did not mention any kind of commitment for aviation, it became clear that emission reduction goals for the sector should be adopted by ICAO in a very short timeframe. The fact that the Program of Action had some goals and a roadmap for actions seems to have been enough to counter any more incisive response from the international regime at this point (UNFCCC, 2009). Certainly, this outcome was affected by the fact that the Copenhagen Accord was nothing short of an empty text with no binding commitments for any specific sector (KEOHANE, 2015). As the international climate regime was unable to provide a proper response to the overall challenge of climate regime, it may have preferred to give more room for ICAO to negotiate an agreement for the aviation sector.

The third factor that influenced the conflictive architecture during this period was the possibility of the inclusion of the international aviation in the EU ETS, which raised many concerns and opposition from different countries in ICAO (ICAO, 2007d; ICAO, 2007e; ICAO, 2007f; ICAO, 2007g; ICAO, 2007h). There was the possibility of some countries and regional

blocs imposing their own market-based measures to the international aviation would create a fragmented regulatory framework. This possibility may have prompted IATA in its decision to adopt voluntary goals and measures. A patchwork of different regional trading systems was a constant threat in this period, and for the subsequent stage of negotiations as will be further explored in the next section. Nevertheless, the main argument is that, at this point, European countries were already looking at the aviation sector as relevant source of emissions and, in the absence of an ICAO coordinated response, they would have included international aviation in the EU ETS.

The EU ETS was established in 2003, as a response to the Kyoto Protocol.²⁸ Its main objective was to help European countries to achieve the GHG emissions reductions targets set by the international climate regime (PIERA, 2016; GONÇALVES, 2016; TRUXAL, 2017; ROMERA, 2018). It is a market-based measure grounded on the cap-and-trade system, in which the principle of its functioning is the establishment of a cap for the overall emissions. Once it is determined, allowances are allocated between member-states, most of them on a free basis, and a small fraction is auctioned. In the first years of the EU ETS, the aviation sector as a whole was excluded from any obligation during the first period of its implementation (2005-2007).

The aviation sector was finally included in the EU ETS in 2008,²⁹ but only for those flights departing and arriving from European-member states, regardless of the nationality of the air operator. Therefore, extraterritoriality was excluded from the EU Directive at this point, and the EU ETS was applied only to air operations that took place within the EU territory, even if the original intention was to include all flights over the European airspace (GONÇALVES, 2016). An important aspect of the EU decision, though, is that the principle of non-discrimination and equal treatment was fully applied. In this sense, all airlines operating in the EU territory were subject to ETS, even if they were not European carriers. The only exemption was the very small operators, with few flights or using very small aircraft, which had no obligations to surrender allowances by the so-called *de minimum* clause (ICAO, 2010c).

The industry position, of course, was against the inclusion of aviation in the EU ETS on a unilateral basis. According to IATA, ICAO should remain the primary forum to discuss any emissions trading guidance, on the basis of mutual consent between states. If emissions trading schemes were to be adopted by the aviation sector, they should be open and implemented on a

²⁸ The EU ETS was established by Directive 2003/87/EC, but only became effective from 2005 onwards.

²⁹ The aviation sector was included by Directive 2008/101/EC, which amends Directive 2003/87/EC. Although the decision to include aviation was made in 2008, the EU ETS was only implemented in the sector after 2012. Therefore, the aviation sector was excluded from the first two phases of the scheme (the first phase was from 2005 to 2007, and the second phase was from 2008 to 2011). Information is available at: <https://ec.europa.eu/clima/policies/ets/pre2013_en>.

global and voluntary basis. Accordingly, IATA stated the following position (2007, p. 2),

Emissions trading may have a role to play, but only as part of a package of measures involving technology, operations and infrastructure. It must be voluntary, and thus not imposed on States by other individual States or regional groupings. Further, it should be open to trading with other industries and developed globally through ICAO in order to minimize competitive distortions.

In 2007, fearing that unilateral actions from states or grouping of states could create a patchwork of different regulatory frameworks, IATA announced its policy towards a carbon neutral growth and eventually carbon free industry in a fifty-year timeframe (IATA, 2007). This was the first step towards the adoption of more ambitious goals that were, to a much lesser extent, incorporated by ICAO. Between 2007 and 2010, IATA participated very actively in the discussions in the ICAO high-level meetings, and also in the GIACC, setting the tone of the initiatives proposed by ICAO. During the High-Level Meeting of 2009, it was clear that ICAO was taking measures considering the industry's stance. IATA did not participate in the GIACC meetings, but it has provided information papers that subsidized the recommendations from the group. Furthermore, when discussing the adoption of aspirational goals and possible strategies and measures, the industry's position was taken into consideration by ICAO and explicitly mentioned in the working papers presented by the Secretariat at the HLM (ICAO, 2009c; ICAO, 2009d).

Finally, at the end of this period, the industry agreed on the following goals (IATA, 2007):

- (i) Fuel efficiency improvement of 1.5% on average per year until 2020;
- (ii) Carbon-neutral growth from 2020; and
- (iii) A net CO₂ emissions reduction of 50% by 2050, compared to 2005 levels.

From these three objectives, ICAO was able to adhere to only two of them. Even if it has increased the level of the fuel efficiency goal to 2% up to 2050, there was no mention to any goals related to a net CO₂ emissions reduction. Even the carbon neutral growth was only agreed on the ICAO 37th Assembly, in 2010, as the GIACC was not able to reach a consensus for the HLM in 2009. At this point, only the goal related to fuel efficiency was set forward, and no mention was made on any goal related to net emissions reduction. Europe, in this case, stated that ICAO should consider the industry's targets as the lower bound for the definition of a global goal (ICAO, 2009g).

Even if, at this point, ICAO has adopted a resolution establishing these two goals, its effectiveness could be questioned. Resolution A37-17/2 was not a result of a broad consensus

between ICAO member-states. In fact, Latin-American countries, China, United States, Australia, Europe have all filed reservation to paragraph 6 of the abovementioned resolution, regarding precisely the aspirational goal of neutral carbon growth. United States (US, 2010) and Australia (AUSTRALIA, 2010) justified their reservation on the basis that there should be no differentiation between ICAO member states, as it would be aligned to the Chicago Convention. China, Argentina, Brazil, India and Saudi Arabia, on the other hand, have issued the so-called “Cuba Declaration”, by which they emphasized that the CBDR should be taken fully into account at any ICAO agreement (ARGENTINA, 2010; BRAZIL, 2010; CHINA, 2010; CUBA, 2010). For European countries, in turn, the Resolution was not ambitious enough, and more stringent goals should be settled. Accordingly, Europe advocated that the global reduction target for greenhouse gas emissions from international aviation should be a 10% reduction by 2020 compared to 2005 levels (EU, 2010).

It is also worth mentioning that ICSA, on the other hand, had not benefited from the same treatment as its position on the matter was not even mentioned in any of the working papers presented by the ICAO Secretariat or by states in the HLM. Although ICSA has also provided information for the work of GIACC, it remains unclear to what extent it was actually taken into account. A preliminary analysis of the final outcome may suggest that the influence from the environmental non-governmental groups was very limited, and may have only served to legitimize, in some way, the decision-making process. At least, ICAO could mention that other actors, beyond the industry, were given voice in the meetings.

Therefore, ICAO acted in this period in response to the fear of losing its regulatory authority to the climate regime and the growth of unilateral actions that would undermine their multilateral functions. The possibility that the UNFCCC could take on the ICAO mandate over the climate agenda led ICAO to finally adopt two main goals which, albeit not so ambitiously in environmental terms and not consensually accepted by all member-states, set the agenda for the next period of negotiations. If ICAO wanted to achieve annual fuel efficiency and carbon neutral growth from 2020 onwards, a global MBM would need to be taken out of papers. This process was led by the states and the non-state actors representing the industry, creating a conflictive climate governance in which the final outcome was the prevalence of the liberal environmentalism consensus, as will be argued in the next sections.

4.1.1.3. The third period from 2010 to 2016: the prevalence of ICAO over the UNFCCC as the primary forum to address emissions from the aviation sector.

In this third period of the analysis, the interaction between the UNFCCC and ICAO was

characterized by the attempt to reconcile the principles of both institutions. The previous period set the ground for the negotiation process that finally result in the adoption of the *Carbon Offsetting and Reduction Scheme for International Aviation* (CORSIA), which contains elements of differentiation and equal treatment, as an attempt to consolidate the CBDR and the non-discrimination principles. The fact that emissions from aviation were not referred to in the Copenhagen Accord provided an opportunity for ICAO to consolidate itself as the legitimate and primary forum to propose mitigation measures and reduction goals for the sector. Nevertheless, even if the conflictive climate governance architecture may have resulted in an apparent consensus, CORSIA may have been designed in such an inconsistent way that discrepancies and new conflicts may emerge in the future.

The adoption of the two aspirational goals – the global annual average fuel efficiency improvement of 2% until 2050 and the carbon neutral growth from 2020 onwards – set the stage for ICAO adopt some kind of measure or strategy. Between 2010 and 2013, the ICAO Council, with the technical assistance of CAEP, reviewed the potential options for a global scheme and narrowed those option to only three, concluding that all of them were technically feasible (ICAO, 2013d). These options were submitted for the consideration of the ICAO Assembly in 2013: (i) a global mandatory offsetting where participants would purchase carbon credits to offset emissions above an agreed baseline; (ii) a global mandatory offsetting complemented by a revenue in which a transaction fee would be applied to each ton of carbon; (iii) a global emissions trading scheme based on the cap-and-trade approach (ICAO, 2013e).

Bearing in mind the technical conclusion of the CAEP, countries had to reach a solution based on a consensus. Once more the prospect of including all international flight overpassing the European territory in the EU ETS prompted a reaction from ICAO Member-states and was rejected by the industry (GONÇALVES, 2016; TUXAL, 2017). Calling upon the extraterritorial reach of the legislation, the Unites States, India, China, Australia and Brazil have politically opposed the extension of the European Directive to their airlines (GONÇALVES, 2016). The U.S. House of Representatives and the U.S. Senate passed the European Union Emissions Trading Scheme Prohibition Act, in 2011, which forbade the U.S. airlines from participating in the EU ETS, offering financial assistance to airlines facing penalties for non-compliance (TUXAL, 2017). In this case, there was a convergence of positions between Brazil and the US, as they have jointly emphasized the need that emission from international aviation should be dealt in a multilateral manner (BRAZIL, 2012).

China has also opposed to the measure as it would hinder the development of its aviation industry and would be an explicit violation of the CBDR principle (LIANG & ZHANG, 2014). India, in turn, took the issue to the international climate regime and the UNFCCC to issue a

declaration opposing the European initiative. The extension of the EU ETS to the aviation sector with no differentiation between air operators would be a unilateral action, and it would also be a violation to the basilar principles of the climate regime.

The scheme stands in violation of the UNFCCC as it does not respect the principles of CDR of developed and developing countries and proposes to operate the ETS outside the EU boundaries without multilateral or bilateral consent. (...) The UNFCCC balance of obligations requires developed countries to provide financial assistance to developing countries, yet here developing country airlines will be contributing to climate and other activities in the EU. In this instance, unilateral measures taken in the name of climate protection turn the FCCC-Kyoto balance of obligations on their head. Unilateral measures imposed beyond borders lend themselves to such perversions of multilaterally agreed frameworks for action. (UNFCCC, 2011)

In this context, the European Union agreed on a stopping-the-clock policy in order to facilitate agreement at the 38th ICAO assembly for the development of a global market-based measure. European countries would give one year for ICAO to move forward in designing a global MBM scheme aimed at reducing emissions from international aviation (EC, 2012). Therefore, when ICAO member-states attended the 38th Assembly, they were aware that some multilateral response should be agreed upon;³⁰ otherwise, the conflictive governance would become even more forceful. According to the European Commissioner for Climate Change, Connie Hedegaard,

The EU has always been very clear: nobody wants an international framework tackling CO₂ emissions from aviation more than we do. Our EU legislation is not standing in the way of this. On the contrary, our regulatory scheme was adopted after having waited many years for ICAO to progress. Now it seems that because of some countries' dislike of our scheme many countries are prepared to move in ICAO, and even to move towards a Market Based Mechanism (MBM) at global level. (European Commission – EC, 2012)

Literature has emphasized that the European Union's threat to include the international aviation sector in the EU ETS worked as a compelling factor for ICAO to act and thus Europe played a role as a normative leader (OBERTHÜR, 2006; GOLÇALVES, 2016; TRUXAL, 2017; ROMERA 2018). In this sense, Gonçalves (2016) argues that the European Union acted as a leader when decided to include international aviation in the EU ETS, inasmuch as it expected that its position would promote the conclusion of an agreement and the European initiative and policies would be used as a model for the global response. Besides, when the EU attempted to set the course of actions that the sector as a whole should adopt, it also acted as a directive leader of the negotiation process in the international arena (GONÇALVES, 2016).

³⁰ The European position was reaffirmed by the joint Decision n. 377/2013/UE took by the European Parliament and the European Council. Available at: <<https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013D0377&rid=5>>. Last access on October 22nd 2018.

Torney (2015), from a different perspective, identifies in more details the main drivers of the European engagement on the climate agenda. Europe's position in the international climate regime seemed to be driven by three main concerns. Firstly, Europe has a normative commitment in adopting more ambitious decarbonizing goals partly due to the internal social pressure from the civil society groups. Secondly, the myth of the "green Europe" helps consolidate the European Union as a political legitimate entity and strengthens the process of EU polity building. Finally, Europe is also driven by material interests and avoiding competitive distortions that could be entailed by the adoption of more stringent environmental goals.

In this last case, Europe would act to generate new market opportunities for its low-carbon industries, and would also try to avoid carbon leakage, in which the European-based industries would move their activities to countries where the environmental legislation is not so strict. This last argument can be applied to the aviation sector as well. The exclusion of the aviation sector from the EU ETS was causing economic distortions between different sectors of the European countries and, as a consequence, the EU considered it should include caps for emissions of airlines. Nevertheless, in this highly competitive market, exempting foreign airlines could create market distortions in detriment to the European airlines. In this case, it seems that Europe acted to protect its industry as well.

Against this background, though, ICAO finally decided to develop a global MBM scheme for international aviation, to be implemented from 2020 onwards (ICAO, 2013b), having the principle of the CBDR should be the basis for any MBM scheme, while minimizing market distortion. This was a compromise to try to accommodate developing and developed countries' interests alike, even if several countries, for different reasons, registered their reservation on those provisions. In the core of this apparent legal conflict, there was an economic concern facing consolidated markets (i.e. United States and Europe) and fast-growing economies (i.e. Asia and Middle East). In the middle of these two blocs were Africa and Latin American countries, which were also concerned that a global MBM could impose an economic burden on their industry (ICAO, 2013c).

In this sense, the United States representative in the 38th ICAO Assembly justified the American reservation on the following ground (ICAO, 2013c, p. 33):

The United States objects to the inclusion of guiding principle (p) in the Annex. For reasons that are well known, the United States does not consider that the principles of the United Nations Framework Convention on Climate Change, including the principle of 'common but differentiated responsibilities and respective capabilities', apply to ICAO, which is governed by its own legal regime. Accordingly, the United States reserves to guiding principle (p) in the Annex to this resolution.

The American position was followed by the European states, which also expressed reservation on the inclusion of the CBDR principle as a basis for a global MBM. For Europe, the recognition of the differentiation treatment should be considered on a national basis and be addressed by the provision of assistance and access to financial resources to fund the implementation of more efficient measures in the developing and least-developed countries (ICAO, 2013c, p. 35).

The UNFCCC principle applies to actions by States. In taking regional action, it would result in market distortions and discrimination among operators if there were to be differing treatment between operators on the basis of their nationality for activities to and from airports in Europe. As such, this would be in contradiction with the principles enshrined in the Chicago Convention and which govern ICAO's work. Many carriers based in less developed countries are in fact among the largest, the most advanced and the most profitable in the world.

The 28 Member States of the European Union and 14 other Member States of ECAC do remain committed to assisting those States that are in need of it with the improvement of the sustainability of their aviation sector.

Against the position of the developed countries, China expressed many concerns from the emerging markets as well, especially India, Saudi Arabia and United Arab Emirates (ICAO, 2013c). For those three countries, ICAO should not impose any constraints on the economic development of the air transport industry in the developing countries, in accordance with their economic and social interests, without any burdensome cost impacts. In this sense, goals for reducing emissions from international aviation should be addressed by the developed countries and based on the CBDR as the guiding principle for the design and implementation of a global MBM.

(...) The Chinese Delegation is of the view that since international aviation of developing countries is still at the stage of development, the adoption of the goal of carbon neutral growth from 2020 without differentiated responsibilities will impede the future development of international aviation of developing countries. The Chinese Delegation would like to reiterate that we support the establishment of goals for reducing emissions from international aviation. However, it must be specified that the developed countries should take the lead in taking reduction measures in order to offset the growth of emissions from international aviation of developing countries. (ICAO, 2013c, p. 36)

The industry, in this case, supported the adoption of a global market-based measure based on some principles. First and foremost, the industry expressed its preference for a simple carbon offsetting scheme, with no revenue generating component. Secondly, it should be designed in a cost-efficient and non-discriminatory manner, in order to preserve fair competition.

Even if government were to consider the CBDR principle, it should be such a way as to minimize market distortions between air operators. Finally, when considering the baseline, sectorial and individual emissions share should be considered, even if an adjustment for “fast-growing” carriers was needed (ICAO, 2013f).

The environmental groups represented by ICSA also registered their position in the ICAO Assembly (ICSA, 2013a; ICSA, 2013b). Accordingly, when developing a global MBM, ICAO should consider the environmental integrity of the carbon credits deemed eligible, in order to avoid double counting of emissions reduction. Credit from questionable sources should be excluded. Furthermore, ICSA proposed that the differentiation between countries should be made on the grounds of the level of emissions of the routes. Therefore, already-heavy carbon pollution routes should have greater offsetting obligations, while obligations of small, fast-growing regional routes should increase as their pollution grow (ICSA, 2013a). Even if ICSA has pointed out some concerns on a global MBM (ICSA, 2013b), they were also favoring the adoption of a cost-efficiency solution as the most feasible alternative for the aviation sector in the short and medium term, which is also an evidence that environmental NGOs were also aligned with the logic of liberal environmentalism in ICAO. ICSA position was re-emphasized during this period in several occasions (ICSA, 2016 a; ICSA 2016b).

Following Resolution A38-18, the Environmental Advisory Group (EAG) was established by the ICAO Council, composed of 17 Council Representatives, with a clear mandate to design and propose a global MBM scheme to be adopted by the Organization. The basis for the EAG work was the so-called “strawman” approach,³¹ a very basic and simple proposal for a future carbon offsetting scheme (ICAO, 2016a). Under this approach, three elements should be considered: (i) volumes of CO₂ emissions from international aviation and overall impact to achieve the carbon neutral goal objective; (ii) costs impact of using different methodologies for distributing offsetting requirements; (iii) and technical exemptions and exemptions of routes to/from low emitting states.

During the period, with the technical support of CAEP, the EAG analyzed the implications of the Strawman proposal on the use of dynamic growth factors in different period and the development of a route-based approach as a means of differentiating countries. The conclusions of EAG were the basis for drafting a resolution that would create an open and mandatory offsetting mechanism for international aviation (ICAO, 2016a; ICAO, 2016c; ICAO, 2016s). As the reconciliation of the CBDR with the non-discrimination principles was not an easy task,

³¹ The strawman approach was the initial draft of the global MBM analyzed by the Environmental Advisory Group (EAG). It was a very simple and basic approach that set the stage for designing CORSIA between 2013 and 2016 (ABEYRATNE, 2016; ICAO, 2016a).

the draft Resolution was presented to member-states in the High-Level Meeting on a Global MBM Scheme (HLMGMBM), held previously to the 39th ICAO Assembly.

During the HLMGMBM, positions were clearly stated. There was an overall support for the adoption of a global MBM in the form of a carbon offset mechanism. There was, though, divergence on how to implement it. The United States had opposed to the so-called sectorial approach to distribute offsetting obligations between air operators. In other words, the distribution of obligations should not exclusively consider the growth in emissions of the sector as a whole, but also the individual growth of each airline. According to the North-American position (ICAO, 2016e, p. 3),

A static 100% sectorial approach places an undue burden on slow-growing carriers, including those based in developing countries and it does not provide an added incentive for individual operators to reduce their own emissions since the offsetting requirement is determined by the sector growth rate.

For the US, thus, airlines that have taken actions to be more efficient should be rewarded, which only be possible if an individual factor was included. Furthermore, the US also supported that there should be a full coverage of the scheme, in the sense that all ICAO member state should have their routes included, and some countries whose participation in the global air transport was very small could be allowed to “opt-out”. The North-American position did not explicitly recognize the CBDR principle, emphasizing, conversely, market concerns (ICAO, 2016e).

China, on the other hand, remained as a fierce defender of the CBDR principle. Against the US “opt-out” position, China advocated for explicitly differentiating developed and developing countries in the text of the draft Resolution. By this clear differentiation, China was not denying its obligation though. In the first phase of the implementation of a global MBM, developed countries as well as states with an individual share of the international air transport activities above 1% of total RTK (as it is China’s case, see *Table 2.2.*) would have to offset their emissions. Although accepting to be part of the scheme, China made a proposal difficult to be accepted. The offsetting requirements of air operators from developed countries would be defined by a sectorial factor of 120% in the initial period of implementation (ICAO, 2016g). In practice, this would mean that more consolidated airlines with a great market share would pay relatively more than non-mature airlines, an opposite position defended by the United States.

Europe hold a middle ground position. While having a preference for an encompassing GMBM without exemptions, Europe recognized the need to reconcile the CBDR and the non-discrimination principles (ICAO, 2016f). In this regard, differentiation would be made in establishing different phases for implementing the MBM – countries with a larger share of the global air transport activity would take the lead. Also, in order to avoid market distortions, a

sectorial formula for the distribution of offsetting requirements would be preferred, a position that was supported by some developing countries (ICAO, 2016m).

A consensus was not reached in the High-Level Meeting, and bilateral and multilateral consultations took place in an informal manner. A closed meeting called “Friends of the President” was convened in August 2016 previously to the 39th ICAO Assembly, where states were not able to move much forward in their positions.³² In this occasion, the US presented the dynamic approach, by which the distribution of offsetting requirements in this global MBM would start with a sectorial approach and would move gradually to an individual share.³³ Both China and the US started considering a wording for voluntary participation in the different phases of the scheme, softening the language towards a less overt and fierce distinction of developed and developing countries.³⁴ In the end, the “Friends of the President Meeting” was able to reach consensus on the voluntary participation by States in the pilot and first phases (from 2021 through 2026), followed by a second phase (from 2027 through 2035) in which all other States except for exempted ones would participate (ICAO, 2016s).

Nevertheless, ICAO was also under strong pressure, especially from the international climate regime. The UN Secretary General had already conveyed his message to the ICAO Council, when he stated that “the eyes of the world are now on airlines, and on ICAO, to drive substantial, concrete progress on reducing emissions”, and that ICAO should finalize a market-based mechanism to ensure carbon-neutral growth after 2020 (UN, 2016). Therefore, when the 39th Assembly started, it was clear that a compromise should be achieved, so that ICAO could provide a proper response not only to the international climate regime, but also to the European Union “stop-the-clock” policy.

The positions presented at the HLM on a Global MBM and at the Friend of the President Meeting were restated in the 39th ICAO Assembly. At this point, countries were able to reach consensus on a draft resolution that established a global market-based measure in the form of an offsetting scheme. As the voluntary participation was defined previously, the main concern was regarding the distribution of offsetting obligations (ICAO, 2016s). Even though the draft resolution presented by the Council (ICAO, 2016s) included the dynamic approach proposed by the US in the “Friends of the President” Meeting, some countries opposed to this formula

³² During this “Friends of the President” meeting, formal working papers were not submitted. However, informal positions from state and non-state actors are available at: < <https://www.icao.int/Meetings/GMBMFP/Pages/Documentation.aspx>>, last access on Oct. 10th 2018.

³³ The US informal position is available at: < https://www.icao.int/Meetings/GMBMFP/Documents/US_reflecting_21_Aug_informal.pdf>. Last access on Oct. 10th 2018.

³⁴ China’s position is available at: <https://www.icao.int/Meetings/GMBMFP/Documents/China_in_pup_22%20Aug_AM.pdf> and the US position is available at: < https://www.icao.int/Meetings/GMBMFP/Documents/20160822_9pm_ICAO_Resolution_drafting_v7.pdf>. Last access on Oct. 10th 2018.

during the Assembly session (ICAO, 2016m; ICAO, 2016n).

Against this difficult context, the 39th ICAO Assembly adopted Resolution A39-03, which provided for the creation of the aviation global scheme. In the end, the United States' position (ICAO, 2016q), supported by the industry (ICAO, 2016k), prevailed over the position of Europe (ICAO, 2016p), China and other developing countries (ICAO, 2016m; ICAO, 2016n), which favored a sectorial approach. In an attempt to reconcile the cleavage between mature and non-mature markets, CORSIA was the ultimate response from ICAO to curb the CO₂ emissions from the sector (and thus to fulfill the mandate provided by the international climate regime). In the conflicts entailed by the climate governance architecture, the interests of the industry over a simple carbon offsetting scheme prevailed and provided the basis for the design elements of CORSIA, which will be further analyzed in the next section.

4.2. CONFRONTATION AND RECONCILIATION BETWEEN THE CBDR AND THE NON-DISCRIMINATION PRINCIPLES UNDER ICAO – THE CORSIA RESPONSE.

CORSIA was finally established by Resolution A39-03 to be a simple carbon offsetting scheme in which all the CO₂ emissions from international air transport above the agreed baseline will need to be offset through the purchase of emissions unit credits in the eligible carbon markets (ICAO, 2016h). In other words, as the aviation sector has not developed enough internal measures to mitigate their own emissions, it will have to foster reduction of CO₂ emissions from other sectors, in order to be able to continue to increase its economic growth and achieve the aspirational goal of stabilizing its net emissions from 2020 onwards. Even if the obligations under CORSIA are established for states towards ICAO, the accountable entity is the air operator itself, which will have to purchase and surrender the carbon credits for all the increase in their emissions above the baseline. There are three main design elements that are central not only for the functioning of CORSIA, but for the reconciliation of the principles of CBDR and non-discrimination.

The first element is related to the period of duration and the phases of implementation of the mechanism. CORSIA is intended to be a temporary mechanism, lasting no longer than 2035, to help the industry to achieve the neutral carbon growth from 2020 onwards. It should only exist as long as there is not enough supply of sustainable alternative fuels for aviation that would bridge the gap between the projected increase of CO₂ emissions and the agreed baseline. Between 2021 and 2035, CORSIA will be implemented in three phases, the pilot phase from 2021 to 2023, the first and voluntary phase from 2024-2026 and the second and mandatory

phase from 2027 to 2035. This so-called *phase-in approach* was an attempt to contemplate CBDR under the offsetting scheme. In operationalizing this approach, the following issues were considered: (i) options for states that participate in the pilot and first phases; (ii) scope of exemptions for the second phase; and (iii) review of the phased implementation.

In the pilot and first phases, participation in the scheme is voluntary (ICAO, 2016h). In other words, states have to express their willingness to include the routes that have as origin or destination an airport in their territory to be part of the scheme. The list of volunteer states was not attached to the Assembly Resolution itself, as states agreed that decisions should be made on an *ad hoc* basis. In addition, those states that accept to voluntarily participate in the scheme should also be able to voluntarily opt-out from the scheme. In the second phase, participation was mandatory for all those states that have an individual share of international aviation activities, measured in RTK terms in the year of 2018, above 0.5% or whose cumulative share on the list of states from the highest to the lowest amount of RTKs reaches 90% of the global RTK. There were only three agreed exemptions from this obligation, namely Least Developed Countries (LDCs), Small Island Developing States (SIDS) and Landlocked Developing Countries (LLDCs).

By choosing for this phase-in approach, the idea was that countries would be differentiated by their respective capabilities. Developing countries whose participation in the total RTK was not so significant would have a broader timeframe to prepare themselves to join the scheme. Airlines from least developed countries with a small share of the global international aviation activity would be exempted from any obligation, unless their state had spontaneously volunteered. The tacit agreement may have been that only more mature markets from the developed countries and very fast-growing economies, namely China, would have to commit themselves in the first phases of CORSIA. In fact, the participation of China, the largest international air transport market, seems to have been the condition for the United States acceptance of any climate agreement under ICAO.³⁵ Therefore, the phase-in approach was nothing but an attempt to reconcile the demands from developing countries regarding the CBDR principles.

The basilar principle in the ICAO regime was inserted in the CORSIA design in the so-called *route-based approach*, which forms the second design element of the mechanism. According to this approach, the scope of CORSIA will be determined based on the routes that are part of the scheme. For a route to be under the scope of CORSIA the countries from both points of the route – origin and destination – will need to have volunteered for the scheme. Once a

³⁵ US Embassy in Brazil. Available at: <<https://br.usembassy.gov/fact-sheet-u-s-china-cooperation-climate-change>>.

route is determined to have offsetting obligations, all airlines that operate that route, regardless of their nationality, will have to offset their emissions above the baseline (ICAO, 2016h).

To illustrate how it will work, in case China and United Kingdom have both volunteered to participate in CORSIA, an airline operating the route Shanghai-London will have the emissions from this flight added to their account, even if this airline is not registered in either of those countries. On the other hand, an airline that operates a route between the United States and Paraguay, in which Paraguay is deemed exempted under CORSIA, will not have to account for those emissions, even if it is a North-American airline. Therefore, air operators will receive the same and equal treatment and will not be discriminated based on their country of registration.

Once it is defined the range of routes that are under the scope of CORSIA, it comes the question of how the offsetting obligations will be distributed between ICAO member-states, which constitutes the third design element of the scheme. Two options were on the table during the negotiation process. The distribution of obligations could be made by a sectorial factor in which all the emission growth above the baseline would be distributed between countries, and, ultimately, between their airlines based on their market share. In this sense, countries with larger and more consolidated airlines would have to pay more for their emissions (ICAO, 2016m). The other option was to distribute the offsetting obligations considering the individual factor of each airline. In this regard, airlines with higher rates of emissions growth would pay relatively more than airlines that grow in a slower pace. The individual factor has also the advantage of incentivizing the adoption of more efficient aircraft and sustainable alternative fuels, as the lower the emissions of an airline, the less it will have to pay for its growth.

In the end, the proposal of the United States of adopting a dynamic approach for distribution of offsetting requirement prevailed, with the support of the industry (ICAO, 2016k). According to the text adopted in the Resolution A39-03, from 2021 to 2029, offsetting obligations will be distributed exclusively by the market share according to the sectorial growth factor. From 2029 onwards, though, an individual share will be increasingly added to the formula, which will be 20% between 2029-2031, and will reach 70% after 2032 (ICAO, 2016h). Although the inclusion of the individual factor has the advantage of providing a positive incentive for airlines to move towards more efficient operations and fuels, it may also cause some important market distortions that will be further analyzed in the next section.

Some two other aspects in CORSIA were not defined in the Resolution A39-03, but they will be fundamental in ensuring that the mechanism will be effective in terms of achieving its goals. The first is the requirements on the monitoring, reporting and verification (MRV) system. As the ultimate accountable entity in CORSIA is the air operator, ICAO will have to

design a robust MRV system by which all the emissions are duly accounted and there is no *carbon greenwashing* (LIPPERT, 2011). In other words, the MRV system is the mechanism by which the environmental integrity of CORSIA will be ensured against the possibility of fraud in the proper counting of emissions by the air operator or the double claiming on the emissions units.

The second aspect is related to the decision on the eligible carbon markets. This decision will define which emissions units can be purchased by aircraft operators under the scheme. According to Resolution A39-03, the ICAO Council will be responsible for developing the material for Emissions Unit Criteria, and, for this matter, it will have to take into account relevant developments in the negotiation process under UNFCCC and Article 6 of the Paris Agreement (ICAO, 2016i; ICAO, 2016l). On this matter, the institutional interaction between ICAO and the UNFCCC may also lead to a conflictive architecture. Although ICAO has decided that emissions units generated from mechanisms established under the UNFCCC and the Paris Agreement are eligible for use in CORSIA, the acceptance of those mechanisms will not be automatic. Some aspects of the units generated under the UNFCCC mechanisms will be further assessed by the ICAO Council, such as requirements on avoiding double counting and on eligible vintage and timeframe (ICAO, 2016h).

As the scope of this research captures only the period from 1992, when the UNFCCC was adopted, to 2016, when ICAO finally reached an agreement and negotiations resulted in Resolution A39-03, the developments on how ICAO will deal with those emerging issues will not be explored. Nevertheless, there is an indication that the conflictive climate governance architecture between those two institutions will still remain regarding the assessment on the eligibility of the carbon markets. In the way CORSIA was designed, there may be a chance that the carbon projects under CDM and the future Sustainable Development Mechanism (SDM)³⁶ may not be accepted under CORSIA, depending if they comply or not with the criteria and requirements decided by the ICAO Council. In other words, a multilateral mechanism established by the UNFCCC framework may be deemed ineligible under ICAO, which is also a multilateral UN forum that encompasses the same member-states, but that has developed a different framework to deal with the CO₂ emissions from the aviation sector.

³⁶ SDM was set forth in art. 6 of the Paris Agreement and will probably replace CDM.

4.3. THE REVERSION OF THE UNDERSTANDING OF THE CBDR AND THE NON-DISCRIMINATION PRINCIPLES UNDER ICAO.

The insertion of the climate change agenda in the ICAO framework created an institutional interaction with the UNFCCC that has contributed for the creation of a conflictive climate governance architecture. This conflict was mainly caused by the transferring of the principles of the international climate regime to a very specific forum – ICAO. Although CORSIA was designed to reconcile the basilar principles of both institutions – the UNFCCC and ICAO –, it may have led to the opposite result. If, on the one hand, the phase-in and the route-based approaches were an attempt to reconcile respectively the principles of CBDR and non-discrimination and equal treatment, on the other hand, the dynamic approach for the distribution of offsetting requirements may have reverted the understanding of both principles.

Under the dynamic approach, the distribution of offsetting requirements for the air operators will take into account the cumulative contribution of each airline for the overall emissions, and also the performance of the individual airline in each year. Adding the individual growth factor into the offsetting requirement had the intention to reward those airlines that adopt more efficient operational measures and fuels, creating a positive economic incentive. Nevertheless, as a collateral effect, it may also create some market distortions between mature and non-mature airlines operating the same route, which may revert the principle of CBDR. Furthermore, this individual growth factor will probably act as a significative regulatory barrier for new entrants, subverting the logic of the Chicago Convention.

CORSIA is based on the idea that all the increase of emissions above the baseline will have to be offset by airlines. The baseline is thus intended to establish the limit of CO₂ emissions for the sector. In practical terms, ICAO has defined a carbon storage, in the sense that the amount of emissions from the international sector in 2020 will establish the “right to emit” to the sector as a whole. When the sectorial growth factor is applied (which will be from 2021 to 2029), all the increase in the emissions above the baseline will be shared by the airlines according to the volume of their activities in the market. In other words, emissions will be allocated according to the market share of each airline. Therefore, more consolidated airlines that have a larger share in the carbon storage will pay relatively more. Likewise, new airlines that usually have growth rates above the global growth rates will pay according to their participation in the market. The smaller the participation is, the less they pay. The larger the airline, the more they pay. Even if the sectorial growth factor creates some market distortions, it allocates emissions in a much broader perspective as it considers the total contribution of all airlines for the current

situation of the carbon emissions (YUE, 2015).

Nonetheless, when the individual growth factor is added to the formula, some relevant economic distortions will emerge. According to Coase (1960), emissions rights work as property rights, which are intended to internalize externalities when the gains of internalization outweigh the costs. Market-based measures, in this case, work as an effective way of transferring those property rights according to market rules with fewer governmental interference. In the CORSIA case, it can be considered that the baseline will not work only as a carbon storage, but it will also determine the CO₂ emissions rights of each stakeholder. Once those emissions rights are determined by the individual baseline based in their emissions up to 2020, those airlines with fewer rights to emit after this period will have to purchase more “rights” in the carbon market, through emissions unit credits.

In this context, it can be argued that those airlines that have grown more and, up to 2021, have acquired a larger share in the market will probably grow in a slower pace when compared to those airlines that are fast-growing and are still trying to consolidate themselves in the market. As shown in the Chapter 3, some projections (IATA, 2016) estimate that airlines from Africa, Middle East, Asia, and, to a lesser extent, Latin America will grow relatively more than the more mature airlines from Europe and North America. Therefore, if those projections prove to be right, an airline from a developing country will have to offset more emissions than an airline from a developed country. More than that, in a same route, different airlines will incur in different offsetting obligations because of a discriminative treatment imposed by an ICAO regulation.

As a counterpoint, it can be said that the phase-in approach will have rectified this distortion, as airlines from developed countries will have paid for their emissions in the first phases of CORSIA. Nevertheless, this first period will last only 6 years, in which the supply of carbon credits is still high, and the prices are low. Questions remain on whether this phase-in approach was enough to establish a fair level playing field for the air operators from the developing countries to compete on an equal basis with the airlines from developed economies.

Finally, it remains uncertain how new entrants will be treated under CORSIA when the individual growth sector is added to the formula. If their baseline is considered as zero, this will mean that any growth in their operations will have to be entirely paid as it will certainly cause an increase in their CO₂ emissions. Even operating the most efficient aircraft and using large proportions of biofuels, a new operator is still consolidating itself in the market and expanding its operations, increasing the number of flights and routes. Depending on their business structure and on the level of price-elasticity of their demand, two situations may arise. If the price-

elasticity of their demand is higher, or, in other words, if the potential consumers of their services are highly sensitive to any increase in the price, the new airline will have to internalize a major part of the costs related to their CO₂ offsetting requirements. Therefore, in order to offer fares that are competitive to attract consumers, the new airline may incur in some financial losses.

If the price-elasticity is less sensitive, the new airline will transfer a major part of those costs to its fare and thus consumers will pay more for the airline ticket of that new operator. However, this difference in the costs is not related to the operational and fuel efficiency of this new airline. This new entrant can be more efficient, but it will be penalized for every growth in its emissions. A more consolidated airline, in turn, will be paying less not necessarily because it is more efficient, but because it was granted with greater rights to emit. In this case, it is likely that CORSIA will be a regulatory barrier for new airlines to operate in a very competitive market in which costs are important factors to determine the capacity of each stakeholder to keep their operations.

A preliminary analysis of the main design elements of CORSIA, as established in the Resolution A39-03, suggests that some market distortions and unfair treatment may have been created in detriment to the airlines from developing and emerging countries. A long negotiation process, characterized by a conflictive interaction between ICAO and UNFCCC, in which the interests of the industry have highly determined the final result, may have created a reversion in the application of the two core principles – CBDR and non-discrimination. The extent to which CORSIA will have a major impact on a new airline’s decision to enter into the market or not is a question to be further explored by future research, for each econometric models will offer some valuable tools of analysis.

4.4. CORSIA AS A LIBERAL ENVIRONMENTALISM RESPONSE FROM THE AIR TRANSPORT SECTOR.

CORSIA is a consensual response from the aviation sector for the international climate regime. Despite its inconsistencies, it was envisioned to reconcile the main basilar principles from both institutions ICAO and the UNFCCC. More than that, it is the ultimate instance of the consensus of the liberal environmentalism. In a conflictive climate architecture that was created as a result from the insertion of the climate agenda under ICAO, the way forward contemplated the interest of the industry of reaching a more cost-effective solution for addressing the CO₂

emissions from the sector. The governance under ICAO, in which non-state actors representing the industry play an active role and have a great influence in the decision-making process, was an important factor to the final outcome.

Market-based approaches rely on the principle of creating economic incentives for particular activities to reduce their environmental impact (COASE, 1960; GODOY & SAES, 2015; POLLITT, 2015). The implementation of those approaches is based on the principle that polluters are not prohibited from causing environmental damage as long as they can address the negative externalities on the environment. Imposing an economic cost would encourage private actors to consider in their matrix of decision environmental costs as well. Likewise, market-based measures would also work as a positive incentive for actor to decide on a more “environmentally desirable” course of action. This logic was applied in the international climate regime under the so-called flexible mechanisms created by the Kyoto Protocol, which transfer to the market the decision on where to invest in the reduction of emissions, which, theoretically, would result in the most cost-efficient outcome. Kyoto was, therefore, the consolidation of the liberal principles in the environmental agenda, in the what Bernstein (2011) has called the environmental liberal consensus.

The final response from ICAO privileged the alternative that was less burdensome to the industry in terms of costs. In the end, ICAO chose a mechanism that had all the characteristics proposed by the industry. The growth in the aviation sector can be offset by the acquisition of carbon units in a non-restricted range of carbon markets. Not only will CDM and SDM be accepted under CORSIA, but all market that meet the eligibility criteria settled by the ICAO Council. No limits to the economic growth were imposed in the form of caps or traffic restrictions. Therefore, it can be argued that CORSIA is also a result from the prevalence of the environmental liberal consensus in ICAO.

5. CONCLUSION.

CORSIA is the ultimate, albeit not the only, response from the aviation sector to curb its CO₂ emissions and achieve the environmental goals settled by ICAO. It is not a perfect mechanism and surely it will not be enough to contain the overall anthropogenic increase of GHG concentrations in the upper atmosphere. However, it is an important step towards a more sustainable path for the development of international air transport. Perhaps in no other sector an agreement was reached with such a strong commitment from those players who will be, in fact, responsible for its implementation – the industry.

The Kyoto Protocol was the trigger mechanism for an institution interaction between the UNFCCC and ICAO, which engendered a conflictive climate governance architecture under ICAO. Although membership of traditional actors is coincident – all the 192 ICAO member-states of ICAO are also part of the UNFCCC – and both institutions are under the umbrella of the UN system, they serve very different mandates and operate under different guiding principles. While ICAO is a technical organization created to solve coordination problems, UNFCCC is a result of a difficult consensus between states on how to cooperate to solve a malign problem. Therefore, the different interests, dynamics and principles involving these two institutions help explain why an agreement was difficult to reach. The CBDR and non-discrimination principles were not easily reconciled, as countries in ICAO used each one of these principles as a symbol to represent the interests of their industries and to protect their own aviation market, creating, as a consequence, this conflictive architecture.

The traditional division between developed and developing countries, which is behind the logic of the CBDR, is not as simple when applied to the aviation sector. On the one hand, developing countries, whose air transport market is still maturing and will have high growth rates in the mid-term, tried to transfer the negotiation dynamics of the UNFCCC to ICAO. For them, some differentiation in the obligations was necessary, as airlines from developed countries are more consolidated in the market and, thus, have contributed to the global emissions for a longer period. Moreover, ICAO could not impose an economic burden on the right of those countries to develop their own industry.

Developed countries, on the other hand, take on a more protectionist stance. Precisely because their airlines are more mature and will grow in a much slower pace in the next 20 years, they were not willing to reach an agreement that excluded obligations for developing countries.

Therefore, those countries had strongly advocated for the non-discrimination principle to be taken fully into account in any agreement under ICAO. In the case of the European Union, the threat to include the international aviation sector in the EU ETS is explained by concerns on the market distortions that would be created if only the European airlines had obligations to reduce their emissions.

In this context, the research problem posed in the beginning of this work – *why climate governance architecture under ICAO was highly conflictive in terms of its main guiding principles?* – can be addressed in the following way. Firstly, ICAO is a strong international organization essentially driven by market concerns. As a consequence, when ICAO was given the mandate to address GHG emissions stemming from international aviation, it was reluctant to incorporate the UNFCCC principles in the negotiation process. In the first decade of negotiations, not a single resolution mentioned the CBDR, whereas the non-discrimination principle was constantly reaffirmed. When the CBDR was finally inserted on the agenda, and the ICAO decided to adopt a global MBM, the question on how to reconcile both principles aroused.

The first main hypothesis of this research has proved to be right. It can, in fact, be argued that ICAO is an autonomous international organization with authority and legitimacy to standardize norms and technical standards for the sector, on the basis of the non-discrimination and equal treatment principles. When called, though, to act on environmental issues, it was not so prone to internalize the UNFCCC principles and rationale. As a result, an overt conflict of principles emerged from the institutional interaction between ICAO and the UNFCCC, resulting in the recognition of ICAO as the primary forum to discuss any measure to be taken by the aviation sector.

When the UNFCCC tried to take on the mandate given to ICAO by Kyoto, ICAO was able to secure its role and avoid greater interference from the international climate regime. The Bali Roadmap was nothing short of an empty program that did not result in any major commitments. In this case, the institutional power exerted by ICAO, which acquired a great extent of autonomy on the environmental agenda beyond its original mandate, was decisive for the final outcome.

As ICAO is mainly driven by market concerns, state and non-state actors were able to establish new timing for the negotiation process, in the sense that discussions took more time to happen in ICAO. The mandate provided by Kyoto was not immediately fulfilled by ICAO. In fact, from 1997 to 2007, little progress was made, and only in 2009 actions were taken by

the Organization. Furthermore, a “forum shopping” option occurred as the rationale of the negotiations in the UNFCCC were transferred to ICAO, adding new dynamics and interests, and resulting in a greater influence from the industry in the final outcome. Transferring discussions to another forum, where market concerns from the aviation sector were more preeminent, helped consolidate the logic of the liberal environmentalism under ICAO as well.

In this sense, an agreement was possible under ICAO because a compromise was reached over a regulation on emissions that was the most cost-effective alternative, reducing the economic burden to the industry. The air transport industry was key actor in ICAO for the adoption of the most cost-efficient measure. More than that, IATA was a fierce advocator that any measure should be multilateral and global in its scope as a means to avoid the fragmentation of the regulatory framework. As a result, this research tried to demonstrate that there was a correlation between the industry’s concerns over economic competitiveness and cost-efficiency, on one the hand, and the ultimate design elements of CORSIA, on the other hand.

CORSIA is the final attempt to reconcile the guiding principles of the UNFCCC and ICAO. In its main design elements, the CBDR and the non-discrimination principle were inserted. Nevertheless, when fully implemented, CORSIA will likely entail some significant market distortions that will place the large part of the costs on the emerging and fast-growing markets. As it was designed, CORSIA will work as mechanism that allocates emissions rights to countries and their airlines according to their market participation. As a result, the more consolidated airlines will be given a larger share of the emissions rights, while non-mature airlines that will probably grow in a larger pace will have to offset more of its emissions, as they have few rights to emit.

In the chapter 3, the concept of asymmetrical multilateralism was developed to set forth the argument that the negotiation process under ICAO did not happen in a level playing field. In most international forums, there are always the rule-makers and the rule-takers as a consequence of the uneven distribution of power (HURRELL, 1999). In the case of ICAO, though, the asymmetrical multilateralism characterizes the final outcome as well. One of the three pillars of multilateralism – diffuse reciprocity – was not fully taken into consideration, as CORSIA will have different cost-benefits for each country, when the individual growth factor is added in the distribution of offsetting requirements. Benefits will not be shared equally or fairly.

This research tried to analyze the negotiation process under ICAO, its institution interaction with the UNFCCC and how actors’ interests were defined. The theoretical framework

chosen was the concept of global governance and conflictive climate governance architecture. Other theoretical frameworks could have been chosen as well, such as international regimes and regime complex literature. Nonetheless, the main goal was to take into consideration not only the interest and positions of states, but also non-state actors, especially the industry. The literature on global governance offers important analytical tools to understand how those non-state actors influence the international relations and through which transnational mechanisms.

It should be stated that this dissertation aimed at addressing some very specific issues on the negotiation process that took place under ICAO. It was not its intention to offer the only valid or more comprehensive framework for analyzing the response from ICAO to the international climate regime. Other complementary and even contrasting analysis are also necessary to enrich the understanding on this very unique climate governance architecture that was created by the institutional interaction between the UNFCCC and ICAO.

Throughout this dissertation, some future research areas were pointed out. As mentioned in Chapter 3, ICSA is the only representative from the environmental groups in ICAO, and its role in the negotiation process did not receive proper attention yet. In this sense, a more in-depth understanding of how the interests of ICSA are defined and on its influence in the environmental agenda of ICAO is still needed. Considering that ICSA is an NGO comprised by different organizations, and none of them is based in a developing country, it would be interesting to understand to what extent ICSA has been a legitimate and effective voice in advocating for an environmental compromise under ICAO.

Furthermore, for this research, the analysis of the ICAO Secretariat as an international bureaucracy was possible through the analysis of the working papers that were prepared and presented at the SBSTA meetings. There was, though, a lack of publicly available information and documentation on the role played by the ICAO Secretariat in the CAEP meetings. Considering that the ICAO Secretariat works as the secretariat of the CAEP meetings, further research on the role played by this bureaucracy may be interesting to understand how neutral they were and to what extent they may have influenced discussions and set the agenda.

Least but not least, CORSIA needs to be further analyzed from an economic perspective. In this dissertation, the scope was limited to the IR theoretical framework. Nevertheless, as CORSIA is an economic regulation in the form of a market-based measure, a comprehensive regulatory impact may be a useful means to assess whether it will, in fact, cause market distortions on different countries. In other words, applying econometric models to CORSIA may help

understand if the reversion of understanding of the CBDR and the non-discrimination principles will prove right in practice, or if it is just a theoretical construction with marginal distortive impacts.

CORSIA may offer some evidence on how the close collaboration between states and private actors is an important means to reach more effective compromises. The level of ambition in the climate regime cannot be disconnected from the actual possibility and technical feasibility of private actors to respond to the goals that are settled. In order to be effective, the transition towards a more sustainable economic model will need compromise and full engagement from the non-state actors as well. After all, the private actors are the ones that have the resources to invest in new technologies and the ability to find solutions to change their patterns of production. In this sense, CORSIA may be not only the consensus of the liberal environmentalism, but also an attempt towards an effective privatization of environmental regulation.

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