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THÈSE

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Présentée par **Antoine Deymier**

Essais sur l'influence des ONG environnementales

Soutenue le 30 Octobre 2017 devant le jury composé de

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Ecole Doctorale Economie et Gestion de Montpellier
Université Montpellier LAMETA Économie - Section CNU 05

ESSAYS ON THE INFLUENCE OF GREEN NGOS

Thèse présentée par **Antoine DEYMIER**
sous la direction de
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July 2017

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Introduction générale

Introduction générale Les questions environnementales occupent aujourd’hui une place prépondérante dans notre quotidien. Rares sont les décisions publiques qui ne prennent pas en compte cet enjeu devenu une priorité, voire une urgence. L’exposition médiatique des problèmes liés à l’environnement tend à nous faire oublier que, par le passé, des décisions importantes ont permis d’aboutir à la prise de conscience que nous connaissons aujourd’hui. En effet, les premières décisions liées à l’environnement par des pouvoirs publics sont vieilles de plusieurs siècles.

En France, une des premières mesure ayant pour but de conserver l’environnement fut la promulgation en 1346 du *Code forestier royal* par Philippe VI¹. Ces premières réglementations visent à conserver l’environnement pour son caractère avant tout utile, notamment en préservant les ressources naturelles et matières premières. Plus proche de nous, dans les pays occidentaux, plusieurs parcs nationaux ont été créés à la fin du *XIX^{me}* siècle. Ce fut notamment le cas aux Etats-Unis avec le Yellowstone National Park, créé en 1872 ou le Yosemite National Park créé en 1890. La logique de ces nouvelles dispositions n’était alors plus de préserver l’environnement pour son caractère utile, mais pour ses qualités esthétiques[Bess and Jacquet (2011)]. L’interdiction par décret de tout artifice humain dans l’espace vierge du parc du Yosemite illustre ce changement de perspective. Ainsi, ce parc fut créé dans l’unique but de préserver la beauté de l’environnement naturel.

En l’espace de plusieurs siècles, nous sommes donc passés d’une considération pure-

¹Le but de ces mesures n’était pas de protéger les forêts en elles-mêmes, mais de réglementer la conservation d’une réserve stratégique et militaire, à savoir le bois, Bess and Jacquet (2011)

ment pratique d'un environnement perçue comme un lieu de ressources à une perception prenant en compte la beauté de l'environnement².

De la même façon, la fin du *XIX^{me}* siècle a vu la création des premières organisations non gouvernementales (ONG) visant à protéger l'environnement. Certaines d'entre-elles existent encore aujourd'hui. La plus connue reste le *Sierra Club* fondé en 1892 aux Etats-Unis, dont le premier président ne fut autre que John Muir, grand artisan de la création du parc national de Yosemite. Les revendications de ces premières organisations ont évolué selon la même logique que les premières réglementations environnementales citées plus haut. C'est à dire en prenant en compte l'environnement dans un premier temps pour des questions stratégiques de conservation pour évoluer ensuite vers une vision purement esthétique [Brulle (2008)]. Jusqu'au début des années 60, c'est cette perspective esthétique qui domine les revendications des ONG environnementales et les réglementations mises en place. Le contexte des mouvements sociaux de grande ampleur des années 1960 furent à l'origine du mouvement environnemental tel qu'on le connaît aujourd'hui [Rome (2003)].

En effet, ces années sont marquées par de nouvelles revendications de la part de la population (égalité Hommes/Femmes, liberté sexuelle...). Parmi ces nouvelles revendications émergea également la question de la pollution et son impact sur la vie quotidienne. Cette prise de conscience s'illustre avec le succès du livre Rachel Carson *Silent Spring*, publié en 1962 et qui décrit les impacts des pesticides sur l'environnement. Combiné à des incidents de pollution environnementale de plus en plus médiatisés, comme décrit par Brulle (2008). Ce livre ouvrit la voie à de nouvelles revendications de la part des ONG environnementales. Ainsi, des questions telles que la vulnérabilité de l'environnement, le lien entre activités humaines et impacts

²Cette logique n'était bien sûr pas la seule, Massard-Guilbaud (2010) montre comment la pollution industrielle en France a fait l'objet d'un décret en 1810. Dans d'autres pays Sellers and Melling (2011) documente plusieurs cas de régulation de la pollution industrielle au début du *XIX^{me}* siècle.

environnementaux ainsi que l'impact de la pollution sur la santé commencèrent à trouver un écho dans la population. Ces nouvelles revendications supplantèrent les anciennes et c'est ainsi que naquit le mouvement environnemental moderne. A partir de ces années, le mouvement environnemental gagne en puissance et profondeur tant au niveau du nombre d'ONG que dans la variété des revendications [Brulle (2008)]. De nombreuses ONG sont créés durant cette décennie et certaines occupent aujourd'hui une place importante dans le débat sur les questions environnementales. C'est le cas du World Wildlife Fund, fondé en 1961 mais aussi de Greenpeace fondée elle en 1969. Ces organisations, leurs actions et leurs impacts sont l'objet de cette thèse

Aujourd'hui, aux Etats-Unis, le mouvement environnemental est considéré comme l'un des plus grands mouvement sociaux, tant par sa durée dont la naissance remonte au *XIX^{me}* siècle que par son nombre de membres, estimé entre 20 et 30 millions, [Brulle (2008)]. C'est donc naturellement que se pose la question de son impact. Celui-ci est aussi complexe et varié que les problématiques environnementales tant sa nature est multidimensionnelle. On ne peut cependant nier que celui-ci a créé une prise de conscience générale de problèmes qui jusque là n'attiraient pas l'attention du grand public. En effet, on trouve des traces de ce mouvement tant dans le domaine public que dans le domaine privé. Néanmoins, bien qu'ayant mobilisé des millions de personnes à travers le monde, créé des centaines d'organisations et d'instituts, cela n'empêche pas aujourd'hui la question environnementale d'être l'un des enjeux les plus important du *XXI^{me}* siècle notamment avec le problème du changement climatique.

La question de l'évaluation de l'impact du mouvement environnemental est donc d'autant plus difficile à trancher qu'il est vaste et multidimensionnel. Une première étape dans cette démarche est de donner une définition de *l'impact des ONG*. Au cours de cette thèse nous définissons l'impact des ONG comme le changement de comportement qu'elles produisent sur les acteurs avec lesquels elles interagissent.

Ainsi, chaque chapitre cherche à mettre en évidence l'influence des ONG sur dif-

férents acteurs publics et privés dans différentes situations. Dans chaque situation, les ONG chercheront à influencer la décision d'un acteur sur son aspect environnemental. Plus particulièrement dans un premier temps nous allons analyser les mécanismes qui relient l'activité des ONG à l'activité politique environnementale à l'aide d'une modélisation théorique et une analyse empirique. Le second chapitre explore les liens entre activités des ONG et leurs couvertures médiatique en ayant recours à un modèle théorique ainsi qu'à une analyse empirique. Finalement le troisième chapitre se penche sur l'impact d'une mobilisation d'activistes sur le comportement d'un régulateur par le biais d'un modèle théorique.

Les ONG environnementales dans l'analyse économique

La littérature économique se concentre sur plusieurs aspects des ONG. le premier concerne les relations entre les ONG et les entreprises. Comme dit précédemment, les ONG environnementales présentent des profils et revendications très diverses et cette diversité se retrouve dans les attitudes des ONG envers les entreprises. Ainsi Hoffman and Bertels (2009) montrent que l'on peut classifier les ONG suivant leurs attitudes envers les entreprises entre celles qui adoptent plutôt une stratégie de confrontation avec les entreprises ou une stratégie de recherche de consensus. La stratégie de confrontation est celle qui a retenue le plus d'attention chez les économistes. Baron (2001) fait une analyse fondatrice des relations entre ONG et entreprises. Il considère les ONG comme des acteurs de "*private politics*", c'est à dire comme des acteurs interagissant avec les entreprises hors du cadre du droit ou de l'ordre public, il montre que ces ONG, avec une opération de boycott peuvent infliger des pertes aux entreprises qui ne font pas assez d'efforts pour l'environnement. Lyon and Maxwell (2011) montrent comment la présence d'ONG empêche les entreprises de présenter une information sur leurs impacts environnementaux qui ne serait pas vraie (*greenwashing*) sous peine de sanctions. Baron and Daniel (2007) se

penche sur la question du choix de l'entreprise cible de l'action des ONGs et montre que ce sont pas forcément les entreprises les plus polluantes qui sont la cible de ces actions, mais celles sur lesquelles ces actions auront la plus grande chance d'aboutir. La question de l'information dans ces actions est centrale pour que le public participe au boycott, ainsi Baron (2005) étudie la compétition entre une ONG et une entreprise pour faire valoir leurs point de vue sur un boycott dans un média dans le but d'influencer la position du public. Empiriquement Couttenier and Hatte (2016) explorent le timing des révélations des ONG qui tirent parti de l'attention des médias à de grands évènements (coupe de monde FIFA, jeux olympiques,...) pour révéler des informations sur les entreprises sponsorisant ces mêmes évènements. Baron (2012) et Baron et al. (2016) s'intéressent à l'interaction entre une ONG préférant la confrontation et une ONG préférant la coopération avec les entreprises. Ils mettent en évidence la présence d'un "*radical flank effect*"³, c'est à dire que la présence d'une ONG préférant la confrontation incite l'entreprise à mettre en place un partenariat avec l'ONG préférant la coopération.

Un autre aspect des ONG ayant retenu l'attention est leurs rôle dans la certification de produits "verts". Heyes and Maxwell (2004) et Fischer and Lyon (2014) analysent l'interaction entre un label crée par une ONG et un label vert déjà existant et montrent les effets de cette compétition sur les propriétés environnementales des labels. Heyes and Martin (2016) explorent la compétition entre ONGs sur le marché de la labéllisation et notamment les implications sur la double dimension du choix du produit labéllisé et du niveau de standards du label. La question de la source des revenus des ONG a aussi été l'objet de recherches, notamment par Aldashev and Verdier (2010), Aldashev et al. (2014) et Heyes and Martin (2015) qui analysent la compétition entre ONGs pour attirer les donateurs, notamment leurs stratégies de différenciation dans leurs positionnement pour se rapprocher des donateurs et le choix de l'étendue de leurs missions. Les recherches présentées ci-dessus traitent principalement de l'interaction des ONG avec des entités privée, d'autres travaux

³Voir Haines (1984)

se sont penché sur les interactions entre ONG et régulateur, notamment sur la base du modèle de Grossman and Helpman (1994). Aidt (1998) et Fredriksson (1999) sont les premiers à inclure un lobby environnemental luttant contre un lobby industriel dans le modèle d'agence commune de Grossman and Helpman (1994). Fredriksson et al. (2005) rajoutent l'implication d'incitations électorales dans le choix de la politique environnementale dans le même type de modèle. Conconi (2003) analyse l'impact des lobbyistes pro-environnement dans la détermination de la politique environnementale dans le cas où les pays décident de la politique commerciale de manière coopérative ou non. Les recherches présentées ci-dessus reposant sur le modèle d'agence commune de Grossman and Helpman (1994) font l'hypothèse que le processus de lobbying des ONG se fait par des donations monétaires. Hors cette hypothèse d'organisations riches prêtes à faire des donations monétaires colle peu au profil des ONG environnementales. Yu (2005) aborde cette question en permettant au lobby pro-environnement de modifier les préférences de la population sur l'environnement plutôt que de faire des dons monétaires au régulateur.

Cette thèse participe modestement à cette littérature en examinant dans deux situations différentes les relations entre ONG et gouvernements et la relation entre activités des ONG et leurs couverture médiatique.

Plan et résumé de la thèse

Résumé de la thèse

Dans un premier temps, nous analysons l'impact des ONG sur le degré d'attention d'un gouvernement aux problèmes environnementaux. Nous montrons qu'un élément essentiel de ce lien vient de la combinaison de 2 phénomènes peu exploités jusqu'à présent: l'attention limitée du gouvernement et la compétition entre problèmes sociaux. La première hypothèse implique que le gouvernement a un niveau fini d'attention qu'il doit allouer à différents problèmes [Jones and Baumgartner (2005)].

Cette ressource limitée rend donc stratégique ses choix. La seconde hypothèse prend en compte la multitude des problèmes sociaux que le gouvernement doit résoudre et la compétition qui s'en suit pour être considéré par le gouvernement [Downs (1972), Hilgartner and Bosk (1988)]. Ces phénomènes rendent l'étude de l'impact des ONG environnementales indissociable des activités des autres ONG défendant d'autres causes. Nous montrons sur des données américaines que l'impact des ONG environnementales sur le degré d'attention politique aux problèmes environnementaux est conditionné par le degré d'attention du régulateur aux autres problèmes sociaux. Il s'agit de l'objet d'étude du premier chapitre.

Ce résultat est obtenu en utilisant des données de couverture médiatique des activités des ONG environnementales. Or la logique de cette couverture médiatique est peu connue, c'est donc sur cette dernière que porte le deuxième chapitre. Celui-ci considère les médias comme des acteurs opérant sur un marché concurrentiel et les ONG environnementales comme des créateurs d'information que les médias peuvent reprendre. Cette étude montre que la logique concurrentielle des médias les forcent à différencier leurs stratégies de couverture médiatique des ONG environnementales, comme le montre Cagé (2014). Alors qu'un média se spécialise dans la couverture de celles-ci, l'autre ne les couvrira que lors de grands événements. Ce résultat est observé empiriquement en utilisant des données issues de la couverture médiatique de 5 ONG par 2 grands quotidiens français sur une période de 3 ans. Ces données mettent en évidence la différence de stratégie de couverture médiatique des ONG environnementales par ces médias ainsi que des disparités de couverture médiatique entre ONG.

Deux événements récents impliquant des ONG/activistes environnementaux ayant eu une grande couverture médiatique sont les cas de l'aéroport de Notre-Dames-des-Landes et du barrage de Sivens. Ces 2 événements ont en commun une forte mobilisation d'activistes environnementaux contre un projet public préalablement accepté par le régulateur local. La principale raison derrière la mobilisation des activistes est que le projet prévu ne prend pas assez en compte les externalités envi-

ronnementales. Les éléments centraux de ces situations sont au coeur du troisième chapitre. Celui-ci examine le comportement d'un régulateur devant accepter ou non un projet créant des profits pour une industrie mais ayant des externalités environnementales. Celui-ci sous-évalue les externalités environnementales par rapport aux profits créés de la même manière que Daubanes and Rochet (2016). Il peut ainsi être amené à accepter des projets qui produisent plus d'externalités que de profits. Des activistes peuvent se mobiliser contre le projet s'il est accepté, le mécanisme de mobilisation est similaire à Passarelli and Tabellini (2013). Cette mobilisation crée des pertes sur les profits de l'industrie qui sont croissantes du nombre de participants. Avec ces pertes, les activistes peuvent amener le régulateur à changer sa décision concernant le projet. Le modèle montre que lorsque leur mobilisation est suffisamment forte, les activistes peuvent corriger le biais du régulateur et le forcer à refuser certains projets. En termes de bien être social, l'impact des activistes dépend de leur capacité à se mobiliser. Suivant la force de leur mobilisation, celle-ci peut être bénéfique pour la société comme elle peut lui être néfaste.

La section suivante discute en détail chaque essai de ce travail.

Partie 1

Ce premier chapitre porte sur l'analyse de la relation entre activités des ONG et l'attention politique sur les questions environnementales. Ce chapitre contient une partie théorique et une partie empirique. L'originalité de ce travail réside dans la prise en compte de 2 phénomènes influençant la relation entre activités des ONG environnementales et activité politique environnementale. La première étant la compétition entre problèmes sociaux et la seconde l'hypothèse d'*attention limitée* du gouvernement.

La première hypothèse part du principe que l'environnement n'est pas le seul problème social qu'un gouvernement doit aborder. Il en existe une multitude, chacun cherchant à être adressé par le régulateur, ce qui donne lieu à une compétition entre problèmes sociaux, comme décrit par Hilgartner and Bosk (1988). La seconde

hypothèse complète la première puisqu'elle postule que le régulateur a une attention limitée. Cela implique qu'il ne peut traiter tous les problèmes, soit à cause d'une contrainte de temps ou de capacité [Jones and Baumgartner (2005)]. Cette caractéristique renforce donc la concurrence entre problèmes sociaux puisque tous ne peuvent être adressés du fait de l'attention limitée du régulateur.

Le modèle théorique formalise les hypothèses présentées ci-dessus. Un régulateur doit stratégiquement allouer un stock d'attention à différents problèmes sociaux. Il décide de l'attention à attribuer à chaque problème en comparant leurs niveaux de visibilité. Ces niveaux de visibilité sont déterminés de façon endogène par la compétition entre les problèmes sociaux. Chaque problème est défendu par un organisation/ONG qui peut réaliser 2 actions. Ces actions sont la sensibilisation de la population au problème en question et l'organisation de manifestations auxquelles la population peut participer. Ces deux actions sont complémentaires [Agnone (2007)] et permettent d'augmenter le niveau d'activité d'un problème. Le niveau de *visibilité* de chaque problème est simplement l'activité relative de chaque problème par rapport à l'activité totale. Ce niveau de visibilité est une fonction croissante de l'investissement fait par l'ONG dans l'organisation de manifestations et du nombre de participants. Les individus décident de participer à une manifestation en comparant les coûts de participation à leurs niveaux de préférences pour ce problème de la même manière que Passarelli and Tabellini (2013). Ces niveaux de préférences sont initialement aléatoires mais peuvent être augmentés avec un investissement dans la sensibilisation de la population par l'ONG [Yu (2005)].

Le modèle se concentre sur le comportement des ONG. Il met en avant leur spécialisation dans certains investissements suivant les caractéristiques initiales du problème qu'elles défendent. Ainsi, si la population est déjà sensibilisé au problème, alors l'ONG préférera investir dans l'organisation de manifestations. Si la population n'est initialement pas sensible au problème, alors l'ONG devra investir plus dans l'éducation que dans l'organisation de manifestations.

Ces prédictions théoriques sont ensuite testées en utilisant des données centrées sur

les Etats-Unis. Ces données permettent d'avoir par année le nombre de proposition de lois pour différents thèmes environnementaux de 1960 à 1995. Cette variable est utilisée comme mesure d'attention politique. Des données sur les manifestations ayant été couvertes par le *New-York Times* sont utilisées pour construire la mesure de visibilité de ces thèmes environnementaux. Ces données nous permettent de montrer l'impact positif de la visibilité des problèmes environnementaux sur leur niveau d'attention politique. Nous montrons aussi les effets indirects de cette visibilité sur d'autres variables, elles-même influençant le niveau d'attention politique aux problèmes environnementaux.

Partie 2

Le chapitre précédent utilise des données issues de la couverture médiatique des activités des ONG. Or, ce lien entre activités des ONG et couverture médiatique est flou du fait du manque de travaux sur ce thème. La raison d'être de ce chapitre est donc d'éclaircir cette question. Pour ce faire, nous avons recours à une modélisation théorique ainsi qu'à une estimation empirique.

La modélisation prend en compte deux médias dans un contexte de concurrence similaire à Cagé (2014). Ces médias peuvent produire dans leurs journaux deux types d'articles: des articles traitant de problèmes environnementaux ou des articles portant sur d'autres sujets. Chaque média choisit les deux quantités d'articles de manière à maximiser son profit. La production de ces articles est coûteuse puisqu'elle demande un travail journalistique. Ce travail journalistique lui-même dépend d'éléments extérieurs qui peuvent faciliter ou compliquer la tâche des journalistes. Ainsi, pour les articles environnementaux, certains événements rendent la production d'articles moins coûteuse (conférence COP, événements climatiques, scandales, actions d'ONG, ...). L'absence de ces événements complique le travail journalistique puisque de plus amples recherches sont nécessaires pour l'écriture

d'articles. Certains de ces événements sont imprévisibles et donc le travail de journaliste est en partie soumis à ces aléas. Cette relation est prise en compte dans le modèle en intégrant une variable aléatoire dans le coût de production des articles. Ce coût de production est décroissant de cette variable qui représente l'état du monde pour chaque type d'articles. Ainsi, un état du monde élevé, qui se traduit dans les faits par des événements environnementaux importants, diminue le coût de production des articles environnementaux.

Face aux médias se présente un lectorat ayant des préférences pour chaque quantité d'articles par thèmes. Nous faisons l'hypothèse que les préférences pour les articles environnementaux sont hétérogènes tandis que le niveau de préférences pour les articles non-environnementaux est constant à travers les lecteurs. Face à cette audience hétérogène, les médias vont différencier leurs journaux afin de relâcher la concurrence en prix. De plus la différenciation opère dans le domaine où les lecteurs sont hétérogènes. Ainsi, un media va écrire plus d'articles environnementaux que l'autre dans le but d'attirer les lecteurs ayant une sensibilité forte à ce type d'articles.

Une fois que l'équilibre de marché est détaillé, nous pouvons mettre en avant l'impact des activités des ONG sur les choix des quantités d'articles des médias. La manière dont l'activité des ONG est modélisé est la suivante: nous faisons l'hypothèse qu'il y a une seule ONG qui transmet un message public à la manière d'un jeu de *cheap talk*. Ce message concerne l'état du monde des événements environnementaux. Une fois le message envoyé, les médias utilisent la règle de Bayes pour réviser leurs croyances sur l'état du monde des événements environnementaux et ainsi adapter leurs quantités d'articles environnementaux. Ce changement dans les quantités d'articles synthétise la couverture médiatique des ONG puisque que c'est la réaction des médias au message des ONG. Le modèle montre que cette réaction dépend principalement du type de média. Le média initialement spécialisé dans les articles environnementaux aura une réaction au message plus forte que le média non spécialisé. Ainsi, la couverture médiatique des ONG varie en fonction des médias. Le modèle implique aussi que la réaction des 2 médias est croissante en la valeur informationnelle du message de

l'ONG et de la réputation initiale de l'ONG. Donc les activités les plus couvertes médiatiquement sont celles qui viennent d'ONG reconnues, avec une forte valeur informationnelle.

Nous testons ces prédictions à l'aide de données sur la couverture médiatique de 5 ONG françaises⁴ dans 2 grands quotidiens nationaux (*Le Monde* et *Le Figaro*). Ces données sont publiques et disponibles sur les différents sites des journaux et ONG. Elles ont été récupérées à l'aide de la méthode du *web scraping*. Le *web-scraping* est une méthode qui permet de récupérer des données issues de pages internet. Ainsi, nous pouvons utiliser les actualités postées sur les sites internet des ONG comme variable représentant leurs activités. Nous utilisons les sites internet des médias pour sélectionner les articles mentionnant les ONG de notre échantillon, de cette manière, nous avons la couverture médiatique de ces ONG dans les 2 médias. Afin de tenir compte de l'importance informationnelle d'une activité d'une ONG, nous utilisons les dépêches *Reuters* mentionnant le nom des ONG comme variable indiquant une activité d'une ONG avec une forte valeur informationnelle. Ces données sont récoltées à partir du 1^{er} Janvier 2013 jusqu'au 31 Décembre 2015 et nous permettent de construire un panel sur la couverture médiatique de ces 5 ONG, dans 2 quotidiens nationaux sur une période de 3 ans. L'estimation empirique de la relation entre activités des ONG et couverture médiatique montre l'impact positif des activités des ONG sur leurs probabilités d'être présentes dans les journaux. L'estimation met aussi en avant les fortes disparités de stratégie de couverture médiatique entre les 2 quotidiens. Ainsi, *Le Monde* a beaucoup plus tendance à couvrir les ONG que *Le Figaro*. L'estimation empirique confirme la différence de stratégie de couverture des médias des activités des ONG, de même que la différence entre les couvertures des ONG suivant leurs réputations. Cette estimation confirme aussi l'impact positif d'une activité d'ONG à forte valeur informationnelle sur la probabilité que cette

⁴Ces ONG sont: *Réseau Action Climat*, *Greenpeace*, *WWF*, *Sea Shepherd* et *Les Amis de la Terre*, certaines ONG françaises de premier plan n'ont pas pu être prises en compte à cause de limitations techniques

activité soit médiatiquement suivie.

Partie 3

Le chapitre précédent s'est penché sur les déterminants de la couverture médiatique des ONG. Une analyse qualitative de la couverture des événements environnementaux durant la période considérée révèle que 2 événements ont particulièrement été repris par les médias. Ils s'agit des cas de l'aéroport de Notre-Dame-des-Landes ainsi que le barrage de Sivens. Ces deux événements ont en commun leur nature de projet public préalablement approuvé par le régulateur local. Néanmoins, ces deux projets ont aussi en commun la forte mobilisation d'activistes contre ces projets. La principale raison derrière ces mobilisations est que le dommage environnemental de ces projets est jugé trop élevé par ces activistes, questionnant ainsi la place des dommages environnementaux dans le processus d'acceptation de ces projets.

C'est sur la base de ces événements que ce troisième chapitre se développe. En effet il modélise un régulateur devant accepter ou non un projet ayant des externalités environnementales et des bénéfices pour une industrie, un cadre similaire à Daubanes and Rochet (2016). Le niveau d'externalité environnementale est incertain tandis que les bénéfices sont certains. Ces externalités peuvent soit être plus faibles que les bénéfices, dans ce cas le projet est dit *bon*, soit plus élevées que les bénéfices, dans ce cas le projet est dit *mauvais*. Par des expertises ou analyses coûts bénéfices, nous supposons que le régulateur connaît le niveau réel de ces externalités si le projet est implémenté. Afin de coller avec les événements présentés ci-dessus, le régulateur accorde un poids moins important aux externalités environnementales par rapport aux bénéfices du projet. Cette différence de valorisation peut amener le régulateur à accepter des projets avec une valeur nette négative en termes de bien être pour la société. Dans son choix d'accepter ou non le projet, le régulateur doit anticiper la réaction d'activistes qui peuvent se mobiliser contre le projet si celui-ci

est accepté. En effet, chaque activiste décide de se mobiliser contre le projet en comparant les coûts de cette mobilisation aux bénéfices. Afin de prendre en compte l'hétérogénéité des préférences des activistes, nous supposons que les coûts de mobilisation sont hétérogènes parmi les activistes, ainsi certains activistes auront un coût très faible à la mobilisation tandis que d'autres auront un coût très élevé.

Les activistes retirent une satisfaction à se mobiliser et celle-ci est proportionnelle à leur niveau de mécontentement par rapport au projet. Ce niveau de mécontentement est obtenu en comparant le niveau espéré des externalités du projet à un niveau de tolérance commun à tous les activistes. Ce mécontentement est nul si le niveau espéré des externalités est plus faible que le niveau de tolérance, en revanche dès lors que ce niveau espéré est supérieur au seuil de tolérance alors le niveau de mécontentement est positif et est croissant en la différence entre le niveau d'externalité espéré et le seuil de tolérance. De plus, comme c'est fréquemment le cas dans les modèles de participation à des manifestations [Granovetter (1978), Passarelli and Tabellini (2013)], nous introduisons de la complémentarité dans les participations des activistes à la mobilisation. Ainsi un activiste décidant de participer à la mobilisation retirera une satisfaction d'autant plus grande si le nombre d'activistes participant initialement à la mobilisation est élevé. La conséquence de la mobilisation est un niveau de perte infligé aux profits de l'entreprise à qui bénéficie le projet. Sa finalité est d'infliger un niveau de perte suffisamment élevé afin que l'entreprise stoppe le projet. Lors de son choix d'accepter ou non le projet, le régulateur prend en compte la possible mobilisation et ses conséquences.

Ce modèle met en évidence le rôle de contre-pouvoir des activistes. En effet, par la menace de leur action, ils corrigent le biais du régulateur en le forçant à refuser des projets qu'il aurait accepté sans la présence des activistes, cette menace de mobilisation augmente donc le bien-être de cette société. En revanche, nous montrons que ce résultat a ses limites puisque l'efficacité de la mobilisation décroît avec l'hétérogénéité des activistes et qu'elle reste efficace face à des niveaux de biais du régulateur relativement faibles. Nous étudions aussi les impacts des activistes sur

le bien-être social et montrons que leur impact peut être positif tout comme il peut être négatif.

Chapter 1

The politics of attention:
competition between social problems

1.1 Introduction

The second half of the XX^{th} century saw the birth of several movements for social and political change. Among these movements, feature the modern environmental movement. As shown by Rome (2003), the context of the sixties helped its birth, specially the release of Rachel Carson's *Silent Spring*. From there the movement grew and attracted many individuals up to a point where the US environmental movement is the biggest and longest running among all other social movement with an estimated 20 – 30 million members [Brulle (2008)]. These movements had major political and social consequences. Among these effects is the level of political attention attributed to these movements which is the focus of this paper. Indeed, this paper seeks to better understand the impact the environmental movement have on the level of US political attention to environmental topics. It develops a simple theoretical model that describes the impact of social movement on political attention. I then use data of US environmental political activity to evaluate this impact. The main idea of this paper is to assume that a regulator has limited attention, and thus must strategically allocate each unit of its attention between every problem. It shows that although the visibility of the environmental movement problem matters for its political attention, what matters more is the amount of attention attributed to other social problems. Therefore we conclude that competition between social problems is the main driver of the allocation of political attention.

It is worth noting that the political attention to these social movement drastically changed during the XX^{th} century. Using data on US political activity¹ we can see this evolution of political attention to social problems and the change between the difference in attention before and after the seventies. Figure 1.1 describes the evolu-

¹The data used here were originally collected by Frank R. Baumgartner and Bryan D. Jones, with the support of National Science Foundation grant numbers SBR 9320922 and 0111611, and were distributed through the Department of Government at the University of Texas at Austin. Neither NSF nor the original collectors of the data bear any responsibility for the analysis reported here

tion of US Congress Hearings² devoted to social movement topics. We see a sharp increase in the share and number of social problems hearings during the second half of the sixties, which coincides with the birth of many of these movements. Before this change social problems hearings represented on average only 13% of total hearings while after this decade they represent on average 25% of total hearings. To construct this figure I adopted the same classification used by Baumgartner and Mahoney (2005)³. Yet, Figure 1.1 does not show the diversity of these social movements and how political attention was allocated between them. This repartition is shown in Figure 1.2 as I decompose social movement hearings into 8 categories in order to see the distribution of those hearings across social problems. Thus Figure 1.2 shows for each year from 1948 to 2010 the allocation of social movement hearings between social problems. Focusing on environmental hearings we see that their share increased during this period. Going from an average of 10% of total social problems hearings prior to 1970 to an average of 18% after 1970. Over the all period, on average, environmental hearings represent 14% of social movement hearings. Which makes environment the third social movement in terms of hearings. The assessment of the political impact of social movement is a tricky question and has mobilized many scholars from various disciplines for a long time. In a meta analysis, Amenta et al. (2010) gathered the results of 45 articles analyzing 54 social movements and published in the top four sociological journals and in the top movement specialty journal between 2001 and 2009. Their goal was to assess and classify movements according to the strength of their political consequences. Among these 45 papers, 6

²According to the US Government Printing Office, *"A hearing is a meeting or session of a Senate, House, joint, or special committee of Congress, usually open to the public, to obtain information and opinions on proposed legislation, conduct an investigation, or evaluate/oversee the activities of a government department or the implementation of a Federal law"*.

Source:<http://www.gpo.gov/fdsys/browse/collection.action?collectionCode=CHRG>

³That is I consider hearing related to the following topics: Civil Rights, Minority Issues, Civil Liberties, Education, Environment, Social Welfare, Labor, Employment, Immigration, Law, Crime, Family Issues and Health.



Figure 1.1: Percentage and number of hearings related to social movements in US Congress

focused on the environmental movement in the US. The lesson from this review is that overall, the environmental movement had modest/weak political consequences. Thus on one hand we have a movement considered as the biggest in the US [Brulle (2008)], but on the other hand its estimated impact is modest/weak [Amenta et al. (2010)]. This paper argues that these findings are due to the combination of two phenomena: the competition between social problem and limited government attention. Indeed, movements compete for political attention. Governments cannot solve all of them at the same time, thus only a few get addressed while many remain



Figure 1.2: Social Movements Hearings

untouched. Therefore the government must choose among all problems which ones should be targeted on the basis on their salience. I assume that the competition process between social problems takes place in two step. First social problems must gain the support of the population by making them aware of it. They can do so with an education effort. In a second phase, groups organize protests, which the population can join, in order to make their problem salient. This process determines the salience of each issue upon which the regulator decides its attention allocation. Although simple, this model highlights this competition process between issues and allows us to derive a set of results in line with the empirical evidences. Among these is the crucial role played by the support of the population in determining the salience of an issue, leading to an organization of issues depending of the degree of

support from the population. That is those issues with an initial great support from the population will not invest much in education effort but rather in the salience effort, while issues with initially low support from the population will first have to invest in education effort before switching to salience effort. I also consider in the extension section the possibility of dependence between issues.

The rest of the paper goes as follow: in the next section discusses the literature on social movement with a multidisciplinary approach. Findings from sociology, political science and economics are presented, from both a theoretical and an empirical point of view. Section 3 then presents the model in its simplified version and present the results. Section 4 discusses the extensions and section 5 concludes.

1.2 Literature review

In a 1972's article, Downs (1972) theorized that public attitudes and position toward most of social movements were driven by an "issue-attention cycle". In a nutshell, this means that a social problem is first largely unknown to general public. It only concerns a limited part of the population and then, for some reasons, most of public attention is focused on it. However, after a short-time period, the problem gradually fades away from the center of public attention. Downs illustrated his point with the case of the environmental movement. Indeed at that time the environmental movement was on the rise, with the creation of multiples organizations in charge of regulating environmental hazards (such as the EPA, founded in 1970). His article illustrates well the pattern of public attention for many social movements, however it has little to say on why a given social movement might suddenly become a top-of-mind issue. It only mentions that "as a result of some dramatic series of events (like the ghetto riots in 1965 to 1967), or for other reasons, the public suddenly becomes both aware of and alarmed about the evils of a particular problem" (Downs (1972) p.39). Hilgartner and Bosk (1988) filled this blank when they modeled a process of rise and fall of social problems. Their key input is to treat public attention as a scare

resource, it is allocated through a fierce competition between social problems in a "system of public arenas" (Hilgartner and Bosk (1988) p.55). Such public arenas are the news media, NGOs, political campaign organizations, books dealing with social issues, private foundations... Social problems are framed and grow in these arenas. They compete there both to enter and to remain on the public agenda. Selection principles that influence which problems will most likely be addressed are at work in these arenas. Such principles are the intensity of the competition, the need for drama and novelty, the danger of saturation, political biases...

However being at the center of the public attention is not a necessary condition for the social problem to be treated. Moreover, as Downs (1972) emphasized, when public attention starts shifting away from the social issue, the problem is still largely unresolved. Thus the next question concerns the consequences of those social movement. This question have mobilized a great number of social scientists over the last decades (see Amenta et al. (2010)). In their paper, the environmental movement was analyzed 6 times among the 45 articles reviewed. Although none of these papers concluded that the environmental movement had no political impact, the results differ when it comes to assessing the intensity of the influence⁴. Thus it seems that the environmental movement is not as powerful as it appears. A glimpse of the competition process between social issue can be found in Baumgartner and Mahoney (2005). They looked at hearings topics in the US Congress over the twentieth century, they note that over that period Congress have shifted its attention from old, traditional issues (Defense, Economic policy ...) to new types of issues (Environmental issues, Health policy...) and that both type of issues competed for attention. Although some of these new topics are not related to any particular social movement some of them were associated to important social movements during the post-World War Two period (Environment, Social Welfare, Civil Rights,...). At the beginning of the

⁴One paper claim that it had a strong influence, two suggest that the influence was modest while three studies argue that the influence was weak. See Amenta et al. (2010), Table 1 for more details.

period, hearings in Congress related to the Environment represented less than 0.5% of total hearings while at the end of the period, in the beginning of the 1990's, they represented between 6 and 7% of total hearings (see Baumgartner and Mahoney (2005), figure 6.A). Thus we see that nevertheless, the environmental movement gained some political attention. The details of this relationship between government attention and the environmental movement are explained below.

Agnone (2007) looked at the relationship between the annual number of US federal laws passed by Congress favorable to the goals of the environmental movement and environmental movement activities from 1957 to 1997. His first result is that there is a positive significant relationship between protest activities and the passage of environmental law. This implies that for an environmental law to be passed, one simply need environmental NGOs to organize demonstrations, marches or any other activity that raises the salience of the environmental issue. As common sense suggests, he also finds a positive relation between public opinion toward environmental issues and the passage of environmental law. A more subtle result concerns the interaction between environmental protests and public opinion. Indeed the core of his investigation is to test his *amplification hypothesis* which posits that the effect of public opinion on public policy on a specific issue is greater when it is accompanied by an increase in the number of protest related to that issue. This interaction between both variables is positive and significant, meaning that both public opinion and protest enhance each other's impact. Thus, protests increase the salience of public opinion in the eyes of policy makers. Another result is that pro-environmental legislation is more likely to be passed under a Democratic government. This is the *Political Opportunities* hypothesis: it simply assumes that a law on a specific issue is more likely to be passed under a friendly government. Since the environmental movement is identified as a left movement, pro-environmental laws should be more likely to be voted under a left government. Also, environmental laws are also more likely to pass on election years.

Olzak and Soule (2009) conducted the same kind of analysis as Agnone (2007). Yet

they came up with some different results. While the previous studies seemed to revealed a direct effect of environmental protest on environmental legislation, this studies weakens this result. It suggest that instead of being direct, environmental protest have only an indirect effect on environmental legislation. The mechanism works as follows: protests have a direct, positive, significant effect on Congress hearings and not on the passage of environmental laws. However there is a positive significant relationship between Congressional hearings and the passage of environmental legislation. The more Congress debate about an issue, the more likely it will legislate it. Thus protests affect environmental legislation only through the positive effect they have of Congressional hearings. The authors find the same positive relationship between election years and the passage of environmental laws as Agnone (2007). However, they find a negative impact of previous environmental legislation on the current probability of passage of environmental legislation. This is consistent with the view that the Environment is not the only problem politicians are facing. Thus once a law is passed, policy makers move to another issue until the Environment becomes once again a top-of-mind problem.

However, there is one period over which the environmental movement seems to have a greater impact. It is during election years. This phenomenon is observed in both Agnone (2007) and Olzak and Soule (2009). It has also been deeply investigated in List and Sturm (2006) and Conconi et al. (2012). Both papers investigated the voting behavior of US politicians over issues related to the environment. Both papers emphasize that US politicians facing reelections have much greater probabilities to vote in favor of environmental legislation than when they do not have reelection concerns. They also developed theoretical models explaining such pandering behavior. Both make the useful distinction between primary issue and secondary issue. The former encompasses political decisions that have a big impact over a large portion of the population (fiscal policy, economic policy...), while the later are issues that have a big impact over a minor share of population but a weak impact over the population as a whole. Such issues are very specific and typically environmental problems are

among them. The main insights from both models is that electoral incentives push politicians to take decisions that are against their personal preferences in order to secure their position in office. This is because if they don't, they would jeopardize their chances of reelection. Thus environmental issues have to be politically strong enough to force politicians to vote in favor of environmental legislation. A similar result is found over voting patterns of US senator over the gun control issue Bouton et al. (2014). Moreover they model the impact of a partisan organization communicating about behavior of politician over the issue they are concerned with. The model predicts that when such organization exists, the pandering behavior of politicians is magnified and thus the legislation is more likely to go as the organization wants.

The papers cited above focus only on the case of the environmental movement and do not consider that there are other secondary issues that compete for political attention. In a spirit close to this paper, Passarelli and Tabellini (2013) formulated a general theory of how political unrest influences public policy. Their economy is divided in N sectors/groups. Each individual in each group decides to participate to a riot. These riots inflict social costs. To prevent these, the regulator allocates more resources towards those who could inflict more damage if they decide to engage in riots. However, groups do not necessarily compete against each other as the policy dimension is unique in their model. Finally, Yu (2005) upgraded the common agency framework of Grossman and Helpman (1994) to allow interest groups to influence the preferences of the population (indirect influence) on top of letting groups directly competing for government attention. He highlights the complementarity of the two kinds of efforts and show that a group with limited resources (such as environmental organizations) might overcome powerful groups (industry groups) if they are good enough at influencing the population preferences. The same kind of comments done for List and Sturm (2006) and Conconi et al. (2012) apply here, as it does not take into account the competition that environmental groups might face against say feminism or anti-war groups.

I build the model on the papers discussed above, I will consider an economy in which a benevolent government will aim at maximizing the welfare of its citizens over one period, thus unlike List and Sturm (2006) and Conconi et al. (2012) we won't focus on reelection incentives. Instead we focus on how a benevolent government would prioritize over issues when it faces multiple demands for political change and has limited resources. These demands will come from groups exogenously endowed with resources that they will have to allocate between direct and indirect effort to gain political attention. Empirical estimation of social movement impact is not a popular topic in economics. However, Madestam et al. (2013) is an exception. As they investigate how tea party's protest in the US impacted voting behavior and incumbent behavior in Congress. They show that Tea Party's protest impacted policy making by influencing political views, that is by raising the salience of specific attributes of specific issues in policy. We contribute to this literature with the empirical investigation.

1.3 Theoretical Framework: Competition for Attention

We assume a static economy populated by a continuum of individuals on $[0, 1]$, there is a benevolent government that wants to maximize the overall utility of its inhabitants. To do so the government has a limited stock of policy that it needs to allocate between N issues. This stock of policy can be considered as a budget, human resources... We assume there is a single organization for each issue, whose goal is to maximize the amount of political attention allocated to its issue. The goal of this model is to provide government and organization optimal behavior that can be tested using data of political attention from the US. Below we describe in details the action of each of these actors.

Set-Up: Government

As precised above, the government wants to maximize the utility of its inhabitants. However, it has a fixed stock of policy that it needs to allocate between the N issues. We assume that each issue j has a *salience* coefficient s^j that is the result of the interaction between individuals and organizations. Each unit of policy allocated to issue j is transformed into utility by the concave function $V(w^j)$ ⁵. Where w^j is the amount of policy/budget allocated by the government to the issue j . Therefore the problem of the government is the following:

$$\begin{aligned} \max_{\{w^j\}_{j=1}^N} & : \sum_{j=1}^N s^j V(w^j) \\ \text{subject to} & \sum_{j=1}^N w^j \leq W \end{aligned}$$

Where W is the size of the initial stock of attention the government has to share. The argument of the $V()$ function is the decision variable of the regulator. We can interpret it as a budget share or an attention allocation which is converted into welfare by the $V()$ function. The point of the model is to show how a benevolent government strategically allocates its attention/budget to social problems when it faces activism from different organizations.

Set-Up: Individuals

The individuals have preferences over each issue. Their preferences have a random component that accounts for the heterogeneity of taste in the population and a non random-component that is impacted by organizations. Formally the preference of an individual i for the issue j is labelled ρ^{ij} and takes the following form:

$$\rho^{ij} = v(e_e^i) + \varepsilon^{ij} \tag{1.1}$$

Where $v(e_e^i)$ is the component of the preference that is impacted by the organization, which will be detailed later. In (1.1) ε^{ij} is the i th realization of the random variable

⁵ $V' > 0 \geq V'', V'(0) = +\infty, \lim_{x \rightarrow +\infty} V'(x) = 0, \forall j \in N$

$\varepsilon^j \sim U[a^j, b^j], \forall i \in n$. For simplicity we assume $a^j = 0, \forall j \in N$, however the upper bound of the noise support shall be different across social problem. We speak of an issue with a high b^j as a popular issue, since a higher upper bound means a higher expected value for the preference for issue j regardless of the effort made by the organization to influence the preferences of the population. Such issues are typically issues dealing with strong moral values such as child care. Given their preferences, agents may choose or not to participate to events improving the salience of specific issues. Organizations are the initiators of such events but in order to be successful they need the participation of sympathizers. Every individual strategically chooses to participate or not to the event. We assume that to participate, each individual has to pay a sunk cost μ whereas participation yields a personal benefit. Namely individual i receives benefit ρ^{ij} for participating to the salience of issue j . Every individual makes this simple cost/benefit comparison for all issues, which is formally done below:

$$v(e_e^j) + \varepsilon^{ij} \geq \mu \Rightarrow \varepsilon^{ij} \geq \mu - v(e_e^j)$$

Thus, individual i participates to the event for issue j with probability $1 - F^j[\mu - v(e_e^j)]$ ⁶. Since we assumed that each ε^{ij} is independently drawn from the same distribution for all individuals, $1 - F^j[\mu - v(e_e^j)]$ is also the share of population participating to the salience of issue j . We now focus on the role of organizations in this model.

Set-Up: Organizations

There are as many organizations as there are issues and each organization can promote only one issue. The goal of each organization is to maximize the salience coefficient that the government attributes to each issue. In order to do so, each organization has a stock of effort that it can allocate between to 2 activities. They can either make the population sensitive to their cause or make their issue salient

⁶Where F^j is the CDF of ε^j

for the government. These two actions are costly for the organizations in the sense that each requires units of effort that each organization has in limited quantities. For the sake of simplicity we assume that the quantity of effort is the same across all social problem, $E^j = E, \quad \forall j \in N$. The two types of efforts are labeled in the following way: e_e^j is assumed to be group's j effort in providing information about problem j to the population. Such effort can be assimilated to advertise campaign to raise awareness about specific issue, movies, books... On the other hand e_s^j refers to group's j effort to make problem j salient in the eyes of the regulator. Such effort encompass traditional protest as well as new forms of protests using communication technologies such as social networks.

Regarding the impact of the education effort, we assume a rather simple relationship between an organization j educational effort as presented in equation (1.1). The preferences of individual i for issue j is increasing in the educational effort of organization j through the $v(e_e^j)$ function that is assumed to be strictly increasing and concave⁷.

As for the salience effort, this effort accounts for all the cost an organization must incur in order to organize a protest, regardless of their nature (time or monetary), we assume that each unit of salience effort translates into units of salience through a v function, which is the same as in equation (1.1)⁸. As the success of a protest depends on the number of participants. Both the salience effort of the organization and the share of the population participating to the events influence the level of salience of an issue. We assume a particular form of relation between the 2, as we assume that they are complement following the *amplification hypothesis* formulated by Agnone (2007) which claim that public opinion and protest are complement regarding their impact on policy change. Therefore the level of activity of issue j takes the following form:

$$v(e_s^j)(1 - F^j[\mu - v(e_e^j)]), \forall j \in N$$

⁷With $v(0) = 0$ and $v'(0) = +\infty$

⁸That is that $v()$ is assumed to be strictly increasing and concave in its argument

This expression describe the level of activity of issue j . However as shows Zhu (1992), issue competition for government attention is zero-sum game. This simply says that government has a finite stock of attention and therefore each additional unit of attention one problem gets must come at the expense of less attention to other problems. In order to take account of this feature, we use a Tullock contest function to represent the salience of issue j compare to the others. Formally it takes the following form:

$$s^j(e_s^j, e_e^j) = \frac{v(e_s^j)(1 - F^j(\mu - v(e_e^j)))}{\sum_{k=1}^N v(e_s^k)(1 - F^k(\mu - v(e_e^k)))} \quad (1.2)$$

From this formulation, what truly matters for a social group in order to be given attention is not its absolute level of protest but how salient it is compared to the other social problem.

Therefore the objective of the organization j is the following program:

$$\begin{aligned} \max_{e_e^j, e_s^j} & : s^j(e_s^j, e_e^j) \\ \text{subject to} & e_e^j + e_s^j \leq E \end{aligned}$$

Using the salience of each problems the government allocates its stock of policy in order to maximize the objective function presented in the set up.

Timeline

The timeline is as follow:

1. In the first stage of the game, the organizations must decide their allocation of efforts between salience and education
2. Then the individuals decide to participate or not to the actions to raise the salience of each problems
3. Observing the realized salience coefficient, the government decide its optimal allocation of policy.

The timing of the game is described in figure 1.3.



Figure 1.3: Timeline

Solving the Model

The objective function of the regulator is simply to maximize the following problem:

$$\begin{aligned} \max_{\{w^j\}_{j=1}^N} & : \sum_{j=1}^N s^j V^j(w^j) \\ \text{subject to} & \sum_{j=1}^N w^j \leq W \end{aligned}$$

Where W is the limited stock of budget a government has. The program is simply a weighted sum of welfare of social problems, where the weights are determined by the competition process between organizations. On the other hand each organization wants to maximize the following program:

$$\begin{aligned} \max_{e_e^j, e_s^j} : s^j(e_s^j, e_e^j) & = \frac{v(e_s^j)(1 - F^j(\mu - v(e_e^j)))}{\sum_{k=1}^N v(e_s^k)(1 - F^k(\mu - v(e_e^k)))} \\ \text{subject to} & e_e^j + e_s^j \leq E \end{aligned}$$

Each organization implicitly aims at maximizing the budget share their problem will receive. For this purpose it has to strategically allocate its efforts into educating the population and organizing events to make its issue salient. The sub-game perfect equilibrium of this game is solved by backward induction. We therefore focus first on the government's problem.

Government's problem

We assume in this subsection that the social planner simply aims at maximizing its weighted welfare function under a policy quantity constraint. This constraint is a proxy for the limited attention of government. The idea behind this that the government cannot solve all problems at the same time, it has to strategically allocate

its budget across all problems. The Lagrangian of this program takes the following form:

$$\max_{\{w^j\}_{j=1}^N} \mathcal{L} = \sum_{j=1}^N s^j V^j(w^j) - \lambda(\sum_{j=1}^N w^j - W)$$

First order conditions from the Lagrangian maximization program give the optimal level of resource allocation across social problem:

$$s^j V'(w^{j*}) = \lambda > 0, \forall j \in N \tag{1.3}$$

Where λ is the Lagrange multiplier associated to the resource constraint of the government. Equation (1.3) indicates that the government uses all its stock of attention. Using \sqrt{x} as a functional form for $V(x)$ we get the following optimal levels of attention w^{j*} .

$$w^{j*} = \left(\frac{s^j}{2\lambda}\right)^2$$

This result simply shows that political attention is an increasing function of salience. This very intuitive result simply says that the government will invest more resources into more salient issues. Using (1.3) and \sqrt{x} as $v(x)$, we can express the allocation of one problem⁹ as a function of its own salience and the salience of the other problems, which yield the following expression

$$w^{i*} = \frac{W}{1 + \sum_{j \neq i} \left(\frac{s^j}{s^i}\right)^2} \tag{1.4}$$

This expression highlights the positive relation between the allocation of problem i and its salience and the negative impact of the salience of other problems on the allocation of attention to problem i . After having investigated the regulator's problem, we study in the next section the organization's allocation problem.

⁹ $\frac{s^j}{2\sqrt{w^{j*}}} = \frac{s^k}{2\sqrt{w^{k*}}}$

The direct and indirect competition for attention

We focus now on the decision problem faced by the organizations, that is the decision they have to take in order to maximize their visibility. As precised in the set up, each organization wants to maximize the salience of the issue it defends with a constraint on the quantity of effort they can invest. Therefore we can write the problem of an organization j using the Lagrangian as follow:

$$\max_{e_e^j, e_s^j} \mathcal{L} = \frac{v(e_s^j)(1 - F^j(\mu - v(e_e^j)))}{\sum_{k=1}^N v(e_s^k)(1 - F^k(\mu - v(e_e^k)))} - \lambda(e_e^j + e_s^j - E)$$

Where λ is the Lagrangian multiplier associated to the resource constraint faced by the organization j . The first order conditions of the j organization program yields the following condition:

$$\frac{\partial \mathcal{L}^j}{\partial e_k^j} = \lambda, \text{ for } k = (e, s)$$

The optimal allocation of effort is the one that provide perfect equality in marginal increase of the objective function regardless of the type of effort, which imply the two following conditions:

$$\frac{\partial \mathcal{L}^j}{\partial e_s^j} = \frac{v'(e_s^{j*})(1 - F^j(\mu - v(e_e^{j*}))) \sum_{k \neq j} v(e_s^{k*})(1 - F^k(\mu - v(e_e^{k*})))}{\left(\sum_{k=1}^N v(e_s^{k*})(1 - F^k(\mu - v(e_e^{k*}))) \right)^2} = \lambda > 0$$

This implies that the marginal increase in salience resulting from one additional unit of salience effort should equal the shadow value of the resource constraint.

$$\frac{\partial \mathcal{L}^j}{\partial e_e^j} = \frac{v(e_s^{j*}) f^j(\mu - v(e_e^{j*})) v'(e_e^{j*}) \sum_{k \neq j} v(e_s^{k*})(1 - F^k(\mu - v(e_e^{k*})))}{\left(\sum_{k=1}^N v(e_s^{k*})(1 - F^k(\mu - v(e_e^{k*}))) \right)^2} = \lambda > 0$$

This implies that the marginal impact of one additional unit of education effort should equal the value of the resource constraint. The way the education effort impact the salience of the issue is straightforward: increasing the awareness of the population implicitly raise the share of individuals who will care enough about the issue so that they will be willing to engage into the costly participation. From both FOC we have $\lambda > 0$, thus implying that the NGO uses all its stock of effort. We can thus write $e_{s_i} + e_{e_i} = E$. Combining these conditions leads to this simple equality:

$$\frac{v'(e_s^{j*})}{v(e_s^{j*})v'(e_e^{j*})} = h^j(\mu^j - v(e_e^{j*}))$$

Where $h^j(\mu^j - v(e_e^{j*}))$ is the hazard rate of $\mu^j - v(e_e^{j*}) = \frac{f^j(\mu - v(e_e^{j*}))}{1 - F^j(\mu - v(e_e^{j*}))}$. Using the probability and cumulative density function of the uniform distribution we get:

$$\frac{v'(e_e^{j*})}{b^j - \mu + v(e_e^{j*})} = \frac{v'(e_s^{j*})}{v(e_s^{j*})} \quad (1.5)$$

Using $v(x) = \sqrt{x}$ as a functional form for $v(x)$ function we get the following closed form solution for salience effort:

$$e_s^{j*} = \begin{cases} -\frac{b_j^2}{8} + \frac{b_j\mu}{4} - \frac{\mu^2}{8} - \frac{1}{8}\sqrt{(b_j - \mu)^2 (b_j^2 - 2b_j\mu + \mu^2 + 8E)} + \frac{E}{2} & \text{if } b^j \leq \mu \\ -\frac{b_j^2}{8} + \frac{b_j\mu}{4} - \frac{\mu^2}{8} + \frac{1}{8}\sqrt{(b_j - \mu)^2 (b_j^2 - 2b_j\mu + \mu^2 + 8E)} + \frac{E}{2} & \text{if } b^j > \mu \end{cases} \quad (1.6)$$

Since the constraint is satisfied, we have $e_e^{i*} = E - e_s^{i*}$. Figure 1.4 presents the evolution of allocation of effort with respect to the parameter b^j ¹⁰. We first see that e_s^{j*} increases in b^j . Moreover we see that when b^j is lower than μ , the salience effort is lower than the education effort ($e_{e_j} > e_{s_j}$). However, when b^j is greater than μ the order between the efforts is reversed, that is that the salience effort is greater than the education effort ($e_{s_j} > e_{e_j}$). The parameters that determine whether organization j invests more in salience rather than in education is thus whether $b^j \geq \mu$. If $b^j > \mu$, it means that even if there were no education efforts by organization j , there would still be individual participating to the events organized by organization j ¹¹. However if $b^j < \mu$, it means that in order to have individuals participating to a protest for issue j , organization j must spend some education effort, otherwise no individual would participate¹². Thus whether the individuals are initially educated about issue j is crucial for the allocation of effort for organization j . If the issue is popular, then the organization will mostly do salience effort, while if the issue is less

¹⁰Calculations are made with $\mu = 1/2$, a stock of effort $E = 1$ and with parameter $b^j \in [0; 2]$

¹¹Because $\mathbb{P}[\varepsilon^{ij} \geq \mu] = 1 - F^j[\mu] > 0$

¹²Because $\mathbb{P}[\varepsilon^{ij} \geq \mu] = 1 - F^j[\mu] = 0$



Figure 1.4: Equilibrium Effort Allocation

popular, the organization will first spend a lot of resources educating the population. Since organizations have the same resource endowment, issues that are popular are more salient than less popular issues. This results is summarized in proposition 1 below:

Proposition 1:

Organization defending issues with high support: $b^j \geq \mu$, will invest more efforts in salience than in education ($e_s^{j} \geq e_e^{j*}$), while organization defending issues with low support, $b^j \leq \mu$ will invest more resources in education than in salience ($e_s^{j*} \leq e_e^{j*}$).*

Therefore, since we assume that all organizations have the same initial stock of efforts, groups which invest more in salience than education will have a greater level of activity and therefore a greater salience. Using equation (1.4) we conclude that groups with initial high support from the population have a greater share of attention. In this basic set up I constructed a simple model where organizations compete

against each other to gain political attention. The government, which has a limited budget, will disproportionately allocate its resources to the more salient issues. In the following section, I investigate whether or not this result holds when problems are not anymore independents.

Interdependence between problems

The assumption that can easily be removed is the independence of problems. It seems more realistic to assume dependence between issues rather than the opposite. Indeed one might argue that if an individual have strong preferences for preserving biodiversity, it would make sense to admit that this level of preferences positively influence the preferences of this same individual for other "green" issues. We can define a subset of problems, say "green" problems, which components are problems which overlap with each other. Such problems can be improving the share of green energy in the energy mix of a country, tackle CO_2 emissions, improving air quality... All those issue have the characteristic that if one gets more attention, then it has a positive externality on all the others. One way to present this is to assume that the education effort of some issues have positive externality on the preferences for other issues. The intuition is to say that if an individual get informed about climate change, it should also influence his preferences other environmental issues. In what follows I present the case where an issue k have a positive impact on preferences for an issue j . This is done by introducing a relation between the noise distribution of individual preferences for issue j and the education effort of issue k . Formally I assume that $\mathbb{E}[\varepsilon^j | v(e_e^k)]$ increases with $v(e_e^k)$. Using the uniform distribution this simply mean that the upper-bound of the support of ε^j increases with $v(e_e^k)$. Thus I now assume that the upper bound of the distribution of ε^j is increasing in $v(e_e^k)$. Formally this means that $\varepsilon^j \sim U[0, b^j + v(e_e^k)]$. I discuss two scenario: the first one is where the two organisations do not cooperate and decides of their effort allocation

independently in order to maximize their own salience while in the second case they join their efforts in order to maximize their global salience.

No cooperation between organizations

In this scenario, each group aims at maximizing its own salience. Therefore, because group j enjoys the positive externality from group k , it may changes its allocation of efforts. The program of group j is the following:

$$\max_{e_e^j, e_s^j} \mathcal{L} = \frac{v(e_s^j)(1 - F^j(\mu - v(e_e^j)|v(e_e^k)))}{\sum_{l=1}^N v(e_s^l)(1 - F^l(\mu - v(e_e^l)))} - \lambda(e_e^j + e_s^j - E)$$

Taking first order condition for each effort and rearranging just has it is done in the baseline model gives the condition that the new optimal allocation of effort has to respect:

$$\frac{v'(e_s^{j*})}{v(e_s^{j*})v'(e_e^{j*})} = h^j(\mu - v(e_e^{j*})|v(e_e^{k*}))$$

Using the uniform distribution expression for the hazard rate, we get that the equilibrium allocation of effort of group j must respect the following equality:

$$\frac{v'(e_s^{j*})}{v(e_s^{j*})} = \frac{v'(e_e^{j*})}{b^j + v(e_e^{k*}) - \mu + v(e_e^{j*})} \quad (1.7)$$

Using $v(x) = \sqrt{x}$ as a functional form for $v(x)$ function we get the following expression for salience efforts:

$$e_s^{j*} = \begin{cases} -\frac{b_j^2}{8} - \frac{b_j\sqrt{e_k^{e*}}}{4} + \frac{b_j\mu}{4} - \frac{e_k^{e*2}}{8} + \frac{\sqrt{e_k^{e*}}\mu}{4} - \frac{\mu^2}{8} + \frac{E}{2} - A & \text{if } b^j \leq \mu \\ -\frac{b_j^2}{8} - \frac{b_j\sqrt{e_k^{e*}}}{4} + \frac{b_j\mu}{4} - \frac{e_k^{e*2}}{8} + \frac{\sqrt{e_k^{e*}}\mu}{4} - \frac{\mu^2}{8} + \frac{E}{2} + A & \text{if } b^j > \mu \end{cases} \quad (1.8)$$

Since the constraint is satisfied, we have $e_e^{j*} = E - e_s^{j*}$. The first thing to note is that when $e_k^e = 0$, then the expression in equation (1.8) is the same as in equation (1.6). Then we have that e_s^j is an increasing function of e_k^{e*14} , and therefore that e_j^e

¹³Where $A = \frac{1}{8}\sqrt{(b_j + \sqrt{e_k^{e*}} - \mu)^2 (b_j^2 + 2b_j\sqrt{e_k^{e*}} - 2b_j\mu + e_k^{e*2} - 2\sqrt{e_k^{e*}}\mu + \mu^2 + 8E)}$

¹⁴ $\frac{\partial e_j^s}{\partial e_k^e} > 0$

is an decreasing function of e_k^e . That is that organisation j freerides on organisation k education effort in order to reallocate education effort toward salience effort. The reason for that is because of the externality, individuals are more aware about problem j than before. This implies that organization j can spend less effort on education and yet get a high level of awareness among the population. Because of this, group j has a higher salience with the externality and group k has a lower salience. This difference of salience ends up in difference in political attention. Group j has a higher level of political attention with the externality while group k has less political attention.

I now present the case where groups join their efforts in order to maximize their global salience

Cooperation between organizations

In this case, group k and j join their effort and fully cooperate in order to maximize their shared salience. That is they allocate their efforts in order to maximize $s^j + s^k \equiv S$. The objective function is the following:

$$S(e_e^j, e_e^k, e_s^j, e_s^k) = \frac{v(e_s^j)(1 - F^j(\mu - v(e_e^j))) + v(e_s^k)(1 - F^k(\mu - v(e_e^k)|v(e_e^j)))}{\sum_{r=1}^N v(e_s^r)(1 - F^r(\mu - v(e_e^r)))}$$

With the following resource constraint: $e_e^j + e_e^k + e_s^j + e_s^k \leq E^j + E^k$. I present the result in the form of simulation. I used \sqrt{x} as $v(x)$ and modeled the externality between issue k and j the following way: $\varepsilon^j \sim U[0, b^j + \alpha v(e_e^k)]$, where α captures the intensity of the externality. I calculated the equilibrium levels of efforts for issue k and j for different values of α in order to see how the strength of the externality influences the allocation of efforts between the 2 issues, I considered in each case that the stock of effort of both organizations is the same and equal to one, $E^j = E^k = 1$. This method is selected because it allows us to have specific equilibrium values for the parameters and thus ease the interpretation of the results. These results are presented in figure ?? ¹⁵ The left panel in figure 1.5 presents the allocation of

¹⁵the results are presented with 10^{-2} precision because of calculation limitations



Figure 1.5: Equilibrium levels of effort

effort of the group which creates the externality while the right panel presents the allocation of effort in the group that benefit from the externality. These allocations are determined such as to maximize the joint salience: $s^k + s^j$. The strength of the externality is captured by the α parameter¹⁶. At the lower level of α , both allocation of efforts in both group are symmetric. This is so because when α is null, it is as there were no externality. Since both groups have similar characteristics, this leads then to have the same allocation of efforts. However, as the externality

¹⁶This α parameter intervenes in the distribution of ε^j . Formally, it is as follow $\varepsilon^j \sim U[0, b^j + \alpha v(e_e^k)]$

grow in strength, both types of effort are reallocated toward the group which creates the externality. This reallocation increases as the externality becomes stronger as described by figure 1.5.

The results from this section are summarized as follow: When there are externalities between problems, two scenarios must be considered. In the first one, groups do not cooperate and decide of their allocation of effort independently. In this setting, the group which enjoys the externality freerides on the educational effort of the group which creates the externality. This allows it to invest more effort in salience, have a greater salience and a greater level of political attention. In the second scenario, groups fully cooperate and therefore join their efforts in order to maximize their global salience. In this scenario, the group which creates the externality concentrate the majority of efforts. The cooperation between groups means that the externality is now internalized and thus more efforts are invested in the group which creates the externality.

Although simple, this model yields results that can be empirically tested. In the following section, I use data from environmental groups activity and link them to their political attention in order to test the model's prediction.

1.4 Empirics

Testable hypothesis

From the model presented above, we want to test the hypothesis that a more salient issue will get more political attention than a less salient one. We rely on data on environmental protests to construct the salience of several environmental issues and data on US environmental activity to measure political attention. We estimate the link between salience and political attention from 1960 to 1995

Data

To empirically study the implication of the model we merge several existing data sources into a novel dataset which include US environmental political activity as well a measure of salience of environmental problems. All data sets are public, their source are detailed below. In the following section we describe outcome variables, explanatory variable and control variables.

Outcome variable

The outcome variable that we are interested in is the level of US political attention to environmental problems. To capture this level of attention we use a measure of political activity at the very first stage of the US political process: the number of bills at the US Congress. We collect this data from the Policy Agenda Project. These data coded bills according to their Major Topic (environment, civil rights,...) and their Minor Topic. Regarding Environmental Issues, their coding procedure accounts for 12 subtopics. Table (1.1) present the description of the environmental subtopics. We therefore count for each subtopic the number of bills from 1960 to 1995. This allows us to construct a panel data set where an environmental subtopic is considered as an individual. This outcome variable represents political attention to environmental issues.

Explanatory variable

The explanatory variable we consider is the salience of a social problem. To construct such index, we rely on the Dynamics of Collective Action Project. This database coded the articles in the New York Times from 1960 to 1995 that reported social movement protests. Since they use the same classification as the Policy Agenda Project we can isolate for each year, the number of protests for each environmental subproblem. Dividing this yearly number of protest by the total number of social

problem protest we can construct the variable *Salience* which is an empirical version of equation (1.6).

$$Salience_{it} = \frac{\text{Protest}_{it}}{\text{Total protest}_t} \times 100$$

Where i refers to the environmental subproblem and t is the time index. Table (1.2) present the descriptive statistics of the salience variable for each subtopics.

Control variables

We use different sets of controls in the regressions. The first one are dummies for each year of observation to account for yearly effect. The second set of control are time variant variables. All these data are available from the Policy Agenda Project¹⁷. The first variable is the number of case treated by the Supreme Court per year and per environmental subtopic. Then we included the number of mentions per year and per environmental subtopic made by the President during the yearly Speech of the Union. Last we included the number of statements per year and per environmental subtopic from the Democratic Party Platform and from the Republican Party Platform.

Empirical Specification

Combining the different data sources, we have a panel data set with 36 observations of 12 individuals, which gives us 432 observations. Where an individual represents an environmental subproblem and observations are at the yearly level. The main empirical specification for estimating the effect of salience on political attention is

¹⁷The data used here were originally collected by Frank R. Baumgartner and Bryan D. Jones, with the support of National Science Foundation grant numbers SBR 9320922 and 0111611, and were distributed through the Department of Government at the University of Texas at Austin. Neither NSF nor the original collectors of the data bear any responsibility for the analysis reported here

based on the following model,

$$Y_{it} = \alpha + \beta \text{Salienc}_{it} + \gamma \mathbf{X}_{it} + \delta_i + \phi \text{Year}_t + \varepsilon_{it} \quad (1.9)$$

Where Y_{it} is the level of political attention of subproblem i at year t measured by either the number of bills or the number of hearings. Salienc_{it} is the salience index of issue i at date t . The vector \mathbf{X}_{it} are the control variable presented above. The parameter δ_i is the fixed effect component and we include dummies controlling for yearly fixed effects. All regressions include heteroskedasticity-robust standard errors that are clustered at the subtopic-level. However, the statistical inference based on these standard error is incorrect as the number of cluster is too small. There are only 12 subtopics therefore we use the wild-t cluster bootstrap method of Cameron et al. (2011) to construct reliable p -values.

Results

Basic result are presented in table (1.3). The first column of table (1.3) present the result of the simplest regression, where the control variables are just the salience variable and the yearly dummies. In this regression we see that salience is positively correlated with the number of bills. The same result is observed in the second column of table (1.3) where I included more control variables. Moreover, the coefficient is relatively stable over the 2 regressions. However when the fixed effects are included, the salience coefficient is not significant anymore. Indicating that salience has no effect on political attention, however we refine this result doing interaction between the salience of each subtopic and their fixed effects. The first set of these regressions is presented in table (1.4). In this table we ran the same regression as in the third column of table (1.3) with the exception that we included an interaction term between a fixed effect and the salience variable. We thus ran 12 different regressions since we have 12 different subtopics. In table (1.4) we only present the coefficient of interest¹⁸. By doing that we get how the salience variable influences the impact

¹⁸Which are the salience coefficient, the interaction term and the fixed effect.

of each fixed effect. As we can see, salience positively and significantly amplifies the fixed effect of Waste Disposal, Toxic Chemical Regulation, Indoor Environmental Regulation, Species and Forest Protection subtopics. Which means that salience is a complement to these specific themes. Then in table (1.5) we see that salience decreases the impact of the State of the Union mentions, the number of statements in both Democrats and Republican parties platforms. However it amplifies the impact of the number of Supreme Court Cases. Thus a higher salience, amplifies the positive impact of the number of Supreme Court Cases on the number of environmental bills. Although we do not find a direct impact of salience on the number of bills in the last regression we do find an indirect impact of salience on the level of political attention through its impact on other variables. We find that the impact of these variables is a complement of the level of salience. Thus confirming the minor impact hypothesis of the environmental movement on political attention as described in Amenta et al. (2010). However it shows the relationship between salience and political attention to environmental problems.

These results complements the findings of Agnone (2007) and Olzak and Soule (2009) on the impact of the environmental movement on political decision. However we used a different measure of political response as we focus on bills whereas they focus on laws. The reason we focused on bills rather than laws is that they are the result of a complex and long political process while bills are at the very beginning of this same process. Thus bills are more likely to represent direct political attention than law. Moreover, they considered only laws that were favorable to the environmental movement whereas we do consider all types of bills. We do so because we measure all kind of political attention to environmental issues, whether it is favorable or not to the environmental movement. Yet the main source of difference between our paper comes from how we measure the environmental activity. Their studies uses the raw number of protest as explanatory variable while we used the salience measure, which takes into account activities of other social movements. Another source of difference between our studies is sample size. In their paper, their regression are based on a

sample of maximum 35 observations while our results are based on a sample size of 432 observations.

1.5 Conclusion

This paper focuses on the impact of the environmental movement on political attention. Using sociological evidences, it provides a general framework of how and why some social problems get full attention of the government whereas other get only limited attention. It provides a first explanation of the statement given by Amenta et al. (2010) that the environmental movement had a modest/weak impact. The general idea developed in this paper is that the reason behind this weak impact is the fierce competition that social problems face between them combined with limited government attention. This insight is first developed in a simple theoretical model which focuses on the competition for attention between organizations defending different issues. It suggests that issues with the largest support from the population should get more salience than other issues and thus more political attention. It is then empirically verified using data of US political system from 1960 to 1995. The empirical investigation highlights the impact of limited government attention on the political attention to environmental issues. However a caveat to this study comes from the nature of the data I use as a measure of activity for the environmental movement. Because I use data that were taken from newspaper coverage of protest, it raises the possibility of selection bias because as shown by McCarthy et al. (1996), media only report a small proportion of actual protest. Thus further research should look at the relationship between green NGO activities and media coverage.

Appendix tables

Table 1.1: SubTopic code description

700	General
701	Drinking water safety
703	Waste disposal
704	Hazardous waste and toxic chemical regulation, treatment and disposal
705	Air pollution, global warming, and noise pollution
707	Recycling
708	Indoor environmental hazards
709	Species and forest protection
710	Pollution and conservation in coastal & other navigable waterways
711	Land and water conservation
798	Research and development
799	Others

Table 1.2: Summary Statistique Salience

Subtopic	Mean	Standard Deviation	Min	Max
700	1.350	1.254	0	5.913
701	0.654	0.646	0	2.402
703	0.442	0.495	0	1.977
704	0.366	0.375	0	1.613
705	0.565	0.546	0	2.376
707	0.104	0.172	0	0.601
708	0.071	0.191	0	0.712
709	2.005	1.611	0	6.897
710	0.010	0.059	0	0.356
711	0.053	0.141	0	0.712
798	0	0	0	0
799	0.024	0.089	0	0.456

Table 1.3: Results Bills

	(1)	(2)	(3)
<i>Dependent variable: Number of Bills</i>			
Saliency Ss Prob	5.773** (2.617)	5.820** (2.323)	-0.258 (0.723)
Supreme Court Case		1.769*** (0.614)	1.432 (1.050)
State of the Union		0.630 (0.543)	0.746* (0.382)
Republican Party Platform		-0.863*** (0.279)	-0.526** (0.206)
Democrat Party Platform		1.239** (0.509)	0.688** (0.327)
1961	-0.553 (0.407)	-1.758** (0.885)	-1.285 (0.972)
1962	-1.327 (0.862)	-2.213* (1.245)	-0.984 (1.184)
1963	2.156* (1.179)	1.328 (0.969)	1.883 (1.303)
1964	-2.195 (1.369)	-2.447 (1.803)	-1.719 (1.584)
1965	9.058*** (3.118)	8.490*** (2.878)	9.332*** (3.430)
1966	3.632* (1.934)	3.126 (2.001)	4.132* (2.475)
1967	11.791* (6.178)	11.273* (6.532)	12.493* (6.646)
1968	-2.085 (1.402)	-2.649 (1.767)	-2.358 (1.640)
1969	16.499*** (4.164)	16.243*** (4.039)	17.643*** (4.536)
1970	12.974*** (3.257)	10.095*** (3.647)	13.379*** (3.808)
1971	22.482*** (5.549)	21.076*** (5.318)	24.010*** (6.418)
1972	0.139 (2.654)	-1.586 (3.059)	1.774 (1.757)
1973	15.993*** (5.469)	14.460*** (4.975)	18.745*** (6.241)
1974	2.126 (1.830)	0.402 (2.594)	3.513 (2.250)
1975	10.498*** (3.556)	8.629** (3.854)	11.464*** (4.357)
1976	-1.958 (2.690)	-4.703 (3.529)	-1.425 (2.602)
1977	16.032*** (4.677)	13.564*** (4.735)	19.077*** (6.721)
1978	5.470* (3.131)	4.177 (3.124)	9.970** (4.826)
1979	11.095*** (3.513)	9.524*** (3.637)	13.223*** (3.976)
1980	-2.083 (1.969)	-4.092 (2.792)	-0.823 (2.224)
1981	1.695 (2.056)	-2.301 (2.811)	0.626 (2.818)
1982	-1.021 (2.749)	-2.845 (3.604)	2.006 (1.904)
1983	3.292 (5.325)	1.705 (6.126)	8.499** (3.693)
1984	-2.088 (4.710)	-4.838 (5.431)	1.571 (3.084)
1985	-4.064 (4.476)	-6.039 (5.471)	-0.676 (2.919)
1986	-5.464 (4.023)	-4.736 (4.959)	-1.522 (3.268)
1987	4.8932 (4.327)	-3.213 (5.232)	1.108 (3.440)
1988	-3.362 (4.189)	-2.032 (4.133)	1.319 (2.230)
1989	17.195** (7.614)	17.917** (7.275)	23.851*** (6.008)
1990	10.524** (4.737)	11.391** (4.920)	14.745*** (4.391)
1991	19.343*** (5.532)	19.878*** (5.971)	24.109*** (6.273)
1992	5.899* (3.300)	6.353* (3.309)	8.808*** (3.169)
1993	16.137***	17.359***	21.130***

Table 1.4: Coefficient Interaction Saliency*SubTopics

	Estimate	Std. Error	t value	Pr(> t)
<i>saliency_{it}</i>	0.569	0.449	1.266	0.206
<i>saliency_{it}</i> * 700	-2.789***	0.640	-4.360	0.00002
700	12.997***	2.062	6.304	0
<i>Saliency_{it}</i>	-0.051	0.796	-0.064	0.949
<i>Saliency_{it}</i> * 701	-2.730**	0.879	-3.107	0.002
701	12.156***	0.995	12.218	0
<i>Saliency_{it}</i>	-0.349	0.722	-0.483	0.629
<i>Saliency_{it}</i> * 703	2.109*	0.886	2.382	0.018
703	8.705***	0.625	13.923	0
<i>Saliency_{it}</i>	-0.367	0.752	-0.488	0.626
<i>Saliency_{it}</i> * 704	8.587***	1.472	5.831	0
704	8.138***	0.674	12.068	0
<i>Saliency_{it}</i>	-0.337	0.823	-0.410	0.682
<i>Saliency_{it}</i> * 705	1.508	2.455	0.614	0.539
705	10.626***	0.697	15.235	0
<i>Saliency_{it}</i>	-0.272	0.720	-0.378	0.706
<i>Saliency_{it}</i> * 707	6.815	4.689	1.453	0.147
707	3.415***	0.714	4.782	0.00000
<i>Saliency_{it}</i>	-0.279	0.716	-0.390	0.697
<i>Saliency_{it}</i> * 708	6.390*	2.894	2.208	0.028
708	0.930***	0.300	3.103	0.002
<i>Saliency_{it}</i>	-1.005	0.765	-1.314	0.190
<i>Saliency_{it}</i> * 709	1.468*	0.661	2.219	0.027
709	32.560***	1.513	21.514	0
<i>Saliency_{it}</i>	-0.258	0.722	-0.357	0.721
<i>Saliency_{it}</i> * 710	-11.763**	4.440	-2.649	0.008
710	15.680***	0.256	61.290	0
<i>Saliency_{it}</i>	-0.237	0.733	-0.323	0.747
<i>Saliency_{it}</i> * 711	-6.318*	2.569	-2.460	0.014
711	7.366***	1.649	4.467	0.00001
<i>Saliency_{it}</i>	-0.258	0.723	-0.357	0.721
<i>Saliency_{it}</i> * 798	NA	NA	NA	NA
798	0.851***	2.398	0.355	0.723
<i>Saliency_{it}</i>	-0.218	0.735	-0.297	0.767
<i>Saliency_{it}</i> * 799	-31.750**	11.126	-2.854	0.005
799	-0.082***	0.343	-0.241	0.810

Note:

*p<0.1; **p<0.05; ***p<0.01

Table 1.5: Interaction Control X Salience

	Estimate	Std. Error	t value	Pr(> t)
<i>Salience_{it}</i>	-0.619	0.654	-0.947	0.344
<i>Salience_{it}</i> *Supreme Court Case _{it}	2.037*	1.133	1.799	0.073
Supreme Court Case _{it}	-0.804	1.169	-0.687	0.492
<i>Salience_{it}</i>	0.085	0.573	0.148	0.882
<i>Salience_{it}</i> *State of the Union _{it}	-0.807***	0.155	-5.215	0.00000
State of the Union _{it}	1.891***	0.287	6.590	0
<i>Salience_{it}</i>	0.531	0.673	0.789	0.431
<i>Salience_{it}</i> *Republican Platform _{it}	-0.219*	0.099	-2.223	0.027
Republican Platform _{it}	-0.206	0.207	-0.994	0.321
<i>Salience_{it}</i>	0.394	0.576	0.684	0.495
<i>Salience_{it}</i> *Democrat Platform _{it}	-0.272*	0.149	-1.825	0.069
Democrat Platform _{it}	0.912**	0.291	3.138	0.002
Fixed effects	Yes			

Note:

*p<0.1; **p<0.05; ***p<0.01

Chapter 2

Making the News: green NGO activity and media coverage

2.1 Introduction

On the 2nd of May 2014, a couple of french NGO cut down a field of transgenic corn in the south of France. This action lead to extensive media coverage on the principals daily newspaper (*Le Monde, Le Figaro, Libération*). On the 5th of April 2015, other NGOs led the same action: they cut down an field of GMO. Yet this time it only led to minor media coverage. How can two same action have such a big difference in their coverage?

In this paper we develop a simple theoretical model providing explanations why some NGO's action make it to the top news while other remain in the shadow. Using this model we predict than some medias will react more to NGO activities than others, and that media's coverage of NGO activity increases with the reputation of the NGO and the precision of their information. We test these hypothesis on a set of data from french newspaper (*Le Monde & Le Figaro*) coverage of a set of NGO over a three year period (from the 1^{rst} of January 2013 to the 31th December 2015) created using web-scraping tools.

The model we use for media competition is similar to the one in Cagé (2014), as we consider a duopoly of profit-maximizing newspaper facing an heterogeneous continuum of readers. We assume that there are two types of news: environmental and non-environmental. Newspapers can decide their editorial policy by choosing the quantities of each type of news. However they face a direct cost which is quantity-dependent, and an indirect one because we assume there is an upper bound on the quantity of news a media can fit in its edition (number of page,...). These assumptions combined lead the media to differentiate themselves on their quantities of environmental news. Thus one media will target readers with high valuation for environmental news while the other one will target readers with lower valuation for environmental news. We have a third actor in this game, which is a NGO. As common in green NGO literature, we assume the NGO can be of two types: good-cop type and a bad-cop type and that the type is private information. We assume

that the NGO can help reducing the cost of environmental news production by doing actions. These actions provide the media with material to write environmental news and thus they help the media to lower the cost of producing news. We model these actions as a message in a sender-receiver cheap talk framework. That is the NGO receive a private signal about a random variable that represents the state of the world in environmental news events and sends a public message to both media about this random variable. When receiving such message, the medias revise their priors about the cost of producing environmental news and adapt their quantities. We show that the NGO (even the good-cop type) has very small incentives to send a message that would lead to less environmental news in medias. Therefore they have an incentive to always send a message that would lead the medias to write more environmental news. We show that the medias reaction to an NGO message is increasing in the reputation of the NGO and in the precision of the initial private signal the NGO receives.

This simple theoretical framework implies some behavior for actors that we aim to test. The empirical analysis has three objectives. First we want to test the difference in coverage of green NGO between medias. Second we want to test whether an increase in the informational value of an NGO's activity translates into greater press coverage. Third we want to see if shocks in environmental news (environmental scandals, COP conferences,...) impact the coverage of green NGOs.

To test these predictions we use data from french newspaper and french NGOs. I first defined a set of NGOs¹ and collected their activity over a certain period (from the 1st of January 2013 to the 31th December 2015). I used their online activity as a proxy for NGOs activity. I considered an online activity any post made on the "actuality" window of each NGO website. I thus collected all their online activity over this time period using web scrapping tools. I then used the search engine of two similar french newspaper (*Le Monde* & *Le Figaro*), and collected the coverage of the NGO in our sample. To do so we collected each article of these newspaper mentioning the

¹5 in total, this restriction is mainly due to data access limitation

name of an NGO in our sample. This allows us to match the activity of the NGOs with their coverage and we see that medias do cover NGO activities, but they do so in different manners. Indeed we show that there is a different coverage behavior between the media which will cover more NGO activities and another that covers them much less. Moreover, we show that there is significant different coverage across NGOs in our sample, as "big" NGOs with great reputation are more covered in both medias. We show that shocks in environmental news (COP conferences, Volkswagen scandal) get NGOs more coverage. We also collected each Reuters dispatches during this time period. This allows us to show that an increase in the informational value of an NGO activity (feature in a Reuters dispatch) greatly influences the probability of being covered.

The rest of the paper is as follow. In section 2 we review related literature on the topic of media and green NGO behavior reviewing not only economic studies but also studies from other social sciences. Section 3 present the model and its solving while section 4 present the empirical testing. Finally section 5 concludes

2.2 Related Literature

Scholars from sociology and political science have looked for the link between environmental non governmental organization (NGO) and the media from both theoretical and empirical point of views. We therefore first summarize their findings. Koopmans (2004) theorized the relationship between a movement and medias and the impact of these interactions. That is how media coverage of a movement will influence the movement itself. He shows that NGO and any other type of activists need to reach large medias to communicate and reach a broader audience. He elicits some characteristics that may influence the magnitude of the impact that a media's report may have on an NGO message (prestige of the speaker, types of activities,...). Yet, this impact might be damped as the media sphere he considers (TV and newspapers) is a bounded space with limited attention. This feature makes it difficult

for activists and NGO to reach a broad audience through media coverage because of the high degree of competition between actors as described by Hilgartner and Bosk (1988). While reviewing the literature on the interdependency between social movements and large medias, Vliegenthart and Walgrave (2012) expand the analysis of Koopmans (2004). They insist that when movements get covered, the media might report a different interpretation of the issue that the movement promotes. This makes it even harder for NGO to have their message covered and communicated to mass audience. Using empirical investigation Vliegenthart et al. (2005) explored in details the impact that news media coverage has on green NGOs. Especially they investigated the media coverage of figures from Dutch environmental organizations from 1991 to 2003. They confirm the theoretical finding that NGOs need the media to get attention as a NGO not gaining any media-attention for its actions is likely to be regarded as unimportant by politicians as well as by the public. Over their study period, they show that environmental NGOs slightly increased their visibility in the medias due to their action. Yet this coverage is very volatile, as it heavily fluctuates over time. Nevertheless, they show that environmental NGOs are more and more views as relevant actors of environmental activity, as they are more and more mentioned together with other environmental actors such as: business, other societal actors, government and political actors. They also provide additional evidences of the competition between NGO for media coverage. As the salience of one NGO in the media in a given year and the year before, negatively impacts the salience of others NGO in that same year. Andrews and Caren (2010) investigated how local newspapers cover green NGO's activities on a 2 year period in North Carolina. To do so they surveyed a representative sample of 187 local environmental NGO in the state. They then looked for news coverage of those organizations in 11 major daily newspaper on a 2 year period after the survey was completed (a total of 2095 articles). Their analysis reveal that local newspapers coverage of NGO activities differs regarding the "type" of the NGO. They tend to cover more well-known groups who use traditional means of protest and who focus on local environmental issues.

Groups who are confrontational and defends non-trivial issues are less covered. To summarize these findings: NGO face a tough competition process against other actors and other type of news in order to be covered by medias. They tend to cover NGO that use conventional advocacy techniques and that not too extreme. We will take account of these findings in our model by using a competitive process to be feature in a media and a distinction between two types of NGO.

We now switch to the presentation of the economic analysis of the media, starting with theoretical findings. Economists have focused their analysis on the bias that media may have. Several explanations emerge, one states that media bias comes from the supply side of the market that is the media itself, the journalists and the owner of the media. This view have been presented in Besley and Prat (2006) and Baron (2006). But bias may also comes from the demand side of the market, that is from the reader themselves. This is the view defended in Mullainathan and Shleifer (2005) and Gentzkow and Shapiro (2006). We follow the latter strand of literature as we use a model in which the difference between medias is the result of an heterogeneous audience.

However we focus on a different kind of *bias*, as we are more interested in the reason why some events get featured in the news while other are left behind. This was studied by Eisensee and Strömberg (2007), their study provides evidence of this selection process between issues in journals, as they look for news coverage of disasters in the world by US news media. They show that disasters occurring at the same time as other newsworthy events, such as the Olympics, receive much less news coverage than disasters that occur at other times. Whether or not a disaster receives coverage influences the probability of public response to that disaster. As a disaster with greater news coverage has a greater probability to receive a US political response. In the same vein Duggan and Martinelli (2011) examine which issues a media with a finite space chooses to cover in a context of election between an incumbent and a challenger. They show that the media may influence the election by allocating more space in its edition to issue favorable to either the incumbent or

the challenger. Also Bernhardt et al. (2008) looked at how media select some news about politicians depending on the preferences of the readers and the impact this has on election. Tella and Franceschelli (2011) show from their study in Argentina that newspaper coverage of some issues (political scandal) is driven by the proximity of the newspaper with the government. The ideological position of the newspaper is also a determinant of whether or not it will speak of some issues as shown by Puglisi (2011), Puglisi and Snyder (2011) and Larcinese et al. (2011). Ellman and Germano (2009) consider a model similar to our own, only that their interest is not in news quantity but in the accuracy of the report. Strömberg (2004) is also similar to our approach, since he consider the choice of quantities for one news item by a media. Yet he doesn't take into account the media bounded space and consider a different cost function for producing the news. Our approach is closer to those last papers since we look for the editorial choices in quantities of news. That is whether or not they write articles on specific issues (here the environment) and the links between their choices and actors of environmental news (NGOs).

Coming to the relationship between an NGO and the media. Since the relationship is based on information transmission we rely on the cheap talk framework developed in economics. We do this because the NGO is communicates a potentially non verifiable information (soft information), and the media (adviser) is unsure whether or not the NGO as private agenda. In their seminal paper Crawford and Sobel (1982) show that as soon as the adviser and the decision maker have differences in their preferences, the adviser will have incentives to hide the truth and therefore have untruthful messages. Sobel (1985) introduces reputation concerns in this strategic communication model. Then Bénabou and Laroque (1992) extend it in the case where the sender has a noisy private signal. We will consider the later case, that is that while the NGO is the sender and the media is the receiver. The NGO will have a private noisy signal about the state of nature and will strategically send a message to the media.

Baron (2005) also studies the relationship between NGO and media but in very par-

particular setting where an NGO and a firm compete in order to get their information covered in a media in order to influence the perception of the general public over a boycott action launched by the NGO on the firm. Our study differs from this in the sense that we are not interested in the tone of the report made by the media on the NGO but on the media's decision to cover NGOs action or not. Very close to our study is Couttenier and Hatte (2016) who studied the timing of NGO disclosure of information of firm's practice when there are media shocks. Our paper differ from theirs in the sense that we encompass the all spectrum of NGO activities, not just information related to firms, but also information campaign, protests,... and look at their media coverage. Our model is also very close to Cagé (2014) in the sense that we study how media differentiate themselves in order to limit price competition. However we depart from her model because we include a third actor that acts as a news provider (the NGO). We now turn to the basic model from which we will derive the testable results.

2.3 Theoretical Framework: Competition in the Market for News

In this section, I present a simple theoretical framework that guides the following empirical analysis. The objective of such model is to provide a basis for the empirical estimation. I want to investigate the reaction of profit maximizing media to green NGO activities. To do so I construct a simple model of market competition between medias and derive the impact of NGO activities on the optimal choices of quantities of environmental articles. I consider a continuum of reader of mass 1, two profit-maximizing newspaper (newspaper 1 and newspaper 2) and an NGO. I study the production choices (price and quantity of news) of newspapers. The analysis is based on a three-stage non cooperative sequential game. The NGO sends a public message

to both medias which then simultaneously chooses their quantity of news and then simultaneously compete in prices.

Set Up: Media

We consider a situation where a newspaper is an indivisible good with different characteristics. Those characteristics represent news types: political news, economic news, environmental news,... We focus on a very simple case, where there are only two type of news: environmental news and the rest respectfully labelled e and r . To each of these type of news corresponds a quantity of articles q_i , where $i \in e, r$. Newspapers maximize their profits by choosing their price p and quantities of articles in each news domain q_i :

$$\max_{p_j, q_{e_j}, q_{r_j}} \Pi_j = \left[p_j D_j(\mathbf{q}_e, \mathbf{q}_r, \mathbf{p}) - \frac{q_{e_j}^2}{\mathbb{E}[v_e]} - \frac{q_{r_j}^2}{\mathbb{E}[v_r]} \right] \quad (2.1)$$

Where q_{i_j} is the quantity of type of news i in media j . The cost of production of news is increasing in quantities but decreasing in the state of the world in this news domain ($\mathbb{E}[v_i]$). This cost is fixed with respect to output, which means I assume that there are no printing costs. The only cost the media has to face is the fixed cost of producing the news. In this case we assume that the marginal cost of producing more news is constant and equal to $\frac{1}{\mathbb{E}[v_i]}$, for $i = e, r$. For the sake of simplicity, we assume that v_i can only take two values: $v_i \in \{0, \bar{v}_i\}, \forall i$ with probabilities $P[v_i = \bar{v}_i] = p_i$ and $P[v_i = 0] = 1 - p_i$. Thus the state of the world in each news domain is either low or high. However, the media doesn't know the true state of nature and thus use the expected value of this state of the world in their news production. This specific cost function encompass the random nature of news production, as it is cheaper to produce articles when there are newsworthy events but much more costly to produce when there are no newsworthy event². We

²No newsworthy event means it would require the media to pay high search cost to produce news, in the environmental domain, COP conference period is a period with many newsworthy event as world leaders gather to deal with climate change problems.

impose a further limitation on the media, which that it is a closed space. By closed space we mean that they cannot produce more than a certain amount amount of news in a given edition³. This forces the media to make strategic choices related to which news item appear in their editions (Boydston (2013)). Therefore medias face a two dimension cost when producing news. The first one relates to the direct cost of producing news while the second one is an indirect cost related to the loss of available space for other types of news.

Set Up: Readers

The choice of readers is to buy or not a newspaper. We assume for simplicity that readers can only buy one newspaper and their outside option is normalized to zero. We assume there is heterogeneity in taste for some type of news. Reader differs with respect to their willingness-to-pay for environmental articles, whereas they have the same preferences for the quantities of other type of news. Reader i maximizes the following utility:

$$U_{ij} = \begin{cases} \theta_{e_i}q_{e_j} + \theta_{r_i}q_{r_j} - p_j, & \text{if he buys media } j \\ 0, & \text{otherwise} \end{cases}$$

Where q_{e_j} is the quantity of environmental news in media j , q_{r_j} is the quantity of other type of news in media j , p_j the price, θ_{e_i} is reader's i willingness to pay for environmental news and θ_{r_i} is its willingness to pay for articles of other type of news. We assume that θ_e is uniformly distributed on the $[0, 1]$ interval while $\theta_{r_i} = \theta_r \forall i$. Reader i buy media j over media k if⁴:

$$\theta_{e_i}q_{e_j} + \theta_{r_i}q_{r_j} - p_j \geq \theta_{e_i}q_{e_k} + \theta_{r_i}q_{r_k} - p_k$$

³In the case of printed newspaper, this refers to the fact that medias are printed on a fixed amount of paper. For digital medias this refers to the fact that media have limited resources and therefore cannot cover every news

⁴I assume that the market will always be covered, therefore making restrictions on some parameters that will appear clearly when solving the model

Readers with higher preferences for environmental news prefer the media which will provide in its edition a great quantity of environmental articles.

Set Up: NGO

We consider a unique NGO who will provide information about the state of the world for environmental news to both medias. It does so by sending a public message to both newspaper. We assume that there are 2 types of senders (NGO): a environmentally biased one and an unbiased one. The distinction between, these 2 types of NGOs refer to the distinction between a good adviser and a bad adviser in the cheap talk literature (Crawford and Sobel (1982))⁵. The type of the NGO is private information. The medias only knows that with some probability μ , the NGO is unbiased and with probability $1 - \mu$ the NGO is environmentally biased. This difference between NGO is reflected in their objective function as presented below⁶.

$$U_g(\mathbf{q}_e, \mathbf{q}_r) = \theta_{e_g} \mathbf{q}_e + \theta_{r_g} \mathbf{q}_r$$

Where θ_{e_g} is the preference of the good cop NGO for environmental news and θ_{r_g} is its preference for the other type of news. Thus the good cop NGO values both type of news while we assume that the bad cop type values only the quantities of environmental articles:

$$U_b(\mathbf{q}_e) = \theta_{e_b} \mathbf{q}_e$$

The distinction between the two types NGO is reflected in their objective function as the bad cop NGO, is an "extreme" one who cares only about the quantity of environmental articles while the moderate one also cares about the quantity of other types of news. The public message they send concern the state of the world in

⁵In the green NGO setting, this distinction is also relevant as it could refers to the distinction between a "good-cop" NGO and a "bad-cop" NGO (Lyon (2010))

⁶Although an NGO is an organization composed of several individual, we assume that is behave as if it is only composed by one individual. We do so to avoid the collective action problem

environmental news. We assume that the NGO have private information about the state of the world, modeled as a private signal, $s \in \{0, 1\}$, correlated with the real state of the world. This implies that the NGO is better informed than the media, which is plausible in the environmental case as recent environmental news event took place because NGO investigated them and disclosed their results⁷. We assume that the signal is correlated with the true state of world yet noisy, meaning that: $\mathbb{P}[s = 1|v_e = \bar{v}_e] = \mathbb{P}[s = 0|v_e = 0] = \gamma > \frac{1}{2}$. Given this private signal, the NGO will send a public message $m \in \{0, \bar{v}_e\}$ to both newspaper. The NGO can costlessly send a wrong message to both media. The newspaper will interpret the message using bayesian updating on $\mathbb{E}[v_e]$ and therefore will adapt their quantities of environmental articles⁸.

Timeline

The timing of the game is follow:

1. The NGO receives its private signal and send the message that maximizes its payoff
2. As the NGO type is private information, the medias internalize the NGO's message and they compete in the quantities of news types they provide to the readers
3. Having chosen their optimal quantities, the medias compete in price
4. Readers choose to read the media that maximizes their payoff.

⁷The 2015 Volkswagen scandal (*Dieselgate*) took place because of emissions tests carried out by the International Council for Clean Transportation in 2013, an NGO specialized in clean transportation. See: www.lemonde.fr/planete/article/2015/09/22/l-ong-a-l-origine-du-scandale-volkswagen_4767318_3244.html

⁸Thus in this model the NGO message is a message on the cost of producing information

In the following section, we solve the model using backward induction to find the subgame-perfect equilibrium of the game. We therefore begin by the choice of the readers.

Solving the Model

In order to determine the demands of each media, we must look for the reader who is indifferent between reading media 1 and 2. We make the assumption that media 2 is the one providing more environmental news⁹. The reader who is indifferent between buying paper 2 and 1 is given by:

$$\theta_r q_{r_1} + \theta_e q_{e_1} - p_1 = \theta_r q_{r_2} + \theta_e q_{e_2} - p_2$$

Since there are only 2 news type The indifferent reader is characterized as follow:

$$\theta_e = \frac{p_2 - p_1 + \theta_r(q_{r_1} - q_{r_2})}{q_{e_2} - q_{e_1}}$$

The indifferent reader is not only defined by the difference in the quantities of environmental news, but also by the difference in the quantities of the other type of news, weighted by the preferences if this other type of news. From this indifferent reader we can derive the demands that face the two media:

$$D_1(\mathbf{p}, \mathbf{q}_e, \mathbf{q}_r) = \frac{p_2 - p_1 + \theta_r(q_{r_1} - q_{r_2})}{q_{e_2} - q_{e_1}}$$

$$D_2(\mathbf{p}, \mathbf{q}_e, \mathbf{q}_r) = 1 - \frac{p_2 - p_1 + \theta_r(q_{r_1} - q_{r_2})}{q_{e_2} - q_{e_1}}$$

We can write down the profits of the medias.

$$\Pi_1 = \left(\frac{p_2 - p_1 + \theta_r(q_{r_1} - q_{r_2})}{q_{e_2} - q_{e_1}} \right) p_1 - \frac{q_{r_1}^2}{2\mathbb{E}[v_r]} - \frac{q_{e_1}^2}{2\mathbb{E}[v_e]}$$

$$\Pi_2 = \left(1 - \frac{p_2 - p_1 + \theta_r(q_{r_1} - q_{r_2})}{q_{e_2} - q_{e_1}} \right) p_2 - \frac{q_{r_2}^2}{2\mathbb{E}[v_r]} - \frac{q_{e_2}^2}{2\mathbb{E}[v_e]}$$

The first parts of these profit functions represent the gross benefits of selling the paper as we do not assume cost of reproducing the papers. The only cost the journals

⁹Assuming the opposite would give rise to a symmetric equilibrium

have to incur represent the cost of producing the articles that will be featured in their edition. This profit function can be is very similar to settings of vertically differentiated firms where choice of quality is costly, just as in Lehmann-Grube (1997). We derive the optimal prices by simply deriving the profit function with respect to their respective prices in order to get the best response functions.

$$\begin{aligned} \frac{\partial \Pi_1}{\partial p_1} &= \frac{p_2 - 2p_1 + \theta_r(q_{r_1} - q_{r_2})}{q_{e_2} - q_{e_1}} = 0 \\ \frac{\partial \Pi_2}{\partial p_2} &= 1 + \frac{p_1 - 2p_2 - \theta_r(q_{r_1} - q_{r_2})}{(q_{e_2} - q_{e_1})} = 0 \\ \Leftrightarrow &\begin{cases} p_1 = \frac{p_2 + \theta_r(q_{r_1} - q_{r_2})}{2} \\ p_2 = \frac{p_1 + q_{e_2} - q_{e_1} + \theta_r(q_{r_2} - q_{r_1})}{2} \end{cases} \end{aligned}$$

Using these best responses, we solve the system and get the following expressions of optimal prices:

$$\begin{aligned} p_1^* &= \frac{q_{e_2} - q_{e_1} + \theta_r(q_{r_1} - q_{r_2})}{3} \\ p_2^* &= \frac{2(q_{e_2} - q_{e_1}) + \theta_r(q_{r_2} - q_{r_1})}{3} \end{aligned}$$

We plug these optimal prices into the demand function to get their reduced form:

$$\begin{aligned} D_1 &= \frac{q_{e_2} - q_{e_1} + \theta_r(q_{r_1} - q_{r_2})}{3(q_{e_2} - q_{e_1})} \\ D_2 &= \frac{2(q_{e_2} - q_{e_1}) + \theta_r(q_{r_2} - q_{r_1})}{3(q_{e_2} - q_{e_1})} \end{aligned}$$

Using the expressions of optimal prices and demand, we replace them in the profit function to get their final expression. We normalize the available space of each media to 1.

$$\begin{aligned} \Pi_1 &= \frac{(q_{e_2} - q_{e_1} + \theta_r(q_{r_1} - q_{r_2}))^2}{9(q_{e_2} - q_{e_1})} - \frac{q_{r_1}^2}{2\mathbb{E}[v_r]} - \frac{q_{e_1}^2}{2\mathbb{E}[v_e]} \\ \Pi_2 &= \frac{(2(q_{e_2} - q_{e_1}) + \theta_r(q_{r_2} - q_{r_1}))^2}{9(q_{e_2} - q_{e_1})} - \frac{q_{r_2}^2}{\mathbb{E}[v_r]} - \frac{q_{e_2}^2}{2\mathbb{E}[v_e]} \end{aligned}$$

We then construct the lagrangian of both expressions

$$\mathcal{L}_1(q_{e_1}, q_{r_1}, \lambda) = \frac{(q_{e_2} - q_{e_1} + \theta_r(q_{r_1} - q_{r_2}))^2}{9(q_{e_2} - q_{e_1})} - \frac{q_{r_1}^2}{2\mathbb{E}[v_r]} - \frac{q_{e_1}^2}{2\mathbb{E}[v_e]} + \lambda(1 - q_{e_1} - q_{r_1})$$

$$\mathcal{L}_2(q_{e_2}, q_{r_2}, \beta) = \frac{(2(q_{e_2} - q_{e_1}) + \theta_r(q_{r_2} - q_{r_1}))^2}{9(q_{e_2} - q_{e_1})} - \frac{q_{r_2}^2}{2\mathbb{E}[v_r]} - \frac{q_{e_2}^2}{2\mathbb{E}[v_e]} + \beta(1 - q_{e_2} - q_{r_2})$$

From these expressions we can get the optimal choices of quantities of each news type. The journals must maximize their profit according to the quantity of environmental news and the quantity of the other type of news, facing the cost of production of the articles and the capacity constraint. Taking first order conditions yield¹⁰:

$$\frac{\partial \mathcal{L}_1}{\partial q_{e_1}} = -\frac{q_{e_1}}{\mathbb{E}[v_e]} + \frac{(2q_{e_1} - 2q_{e_2} - 2q_{r_1}\theta_r + 2q_{r_2}\theta_r)}{-9q_{e_1} + 9q_{e_2}} + \frac{9(-q_{e_1} + q_{e_2} + q_{r_1}\theta_r - q_{r_2}\theta_r)^2}{(-9q_{e_1} + 9q_{e_2})^2} - \lambda = 0$$

$$\frac{\partial \mathcal{L}_2}{\partial q_{e_2}} = -\frac{q_{e_2}}{\mathbb{E}[v_e]} + \frac{(-8q_{e_1} + 8q_{e_2} - 4q_{r_1}\theta_r + 4q_{r_2}\theta_r)}{-9q_{e_1} + 9q_{e_2}} - \frac{9(-2q_{e_1} + 2q_{e_2} - q_{r_1}\theta_r + q_{r_2}\theta_r)^2}{(-9q_{e_1} + 9q_{e_2})^2} - \beta = 0$$

$$\frac{\partial \mathcal{L}_1}{\partial q_{r_1}} = -\frac{q_{r_1}}{\mathbb{E}[v_r]} + \frac{2\theta_r(-q_{e_1} + q_{e_2} + q_{r_1}\theta_r - q_{r_2}\theta_r)}{-9q_{e_1} + 9q_{e_2}} - \lambda = 0$$

$$\frac{\partial \mathcal{L}_2}{\partial q_{r_2}} = -\frac{q_{r_2}}{\mathbb{E}[v_r]} + \frac{2\theta_r(-2q_{e_1} + 2q_{e_2} - q_{r_1}\theta_r + q_{r_2}\theta_r)}{-9q_{e_1} + 9q_{e_2}} - \beta = 0$$

$$\lambda \frac{\partial \mathcal{L}_1}{\partial \lambda} = \lambda(1 - q_{e_1} - q_{r_1}) = 0$$

$$\beta \frac{\partial \mathcal{L}_2}{\partial \beta} = \lambda(1 - q_{e_2} - q_{r_2}) = 0$$

From these first order conditions and assuming that the constraints are binding¹¹

$$q_{e_2} + q_{r_2} = 1 \Leftrightarrow q_{r_2} = 1 - q_{e_2}$$

we the following expressions for both Lagrange multipliers:

$$\lambda = -\frac{q_{e_1}}{\mathbb{E}[v_e]} + \frac{2(q_{e_1} - q_{e_2})(1 + \theta_r)}{-9q_{e_1} + 9q_{e_2}} + \frac{9((q_{e_2} - q_{e_1})(1 + \theta_r))^2}{(-9q_{e_1} + 9q_{e_2})^2}$$

$$\lambda = -\frac{1 - q_{e_1}}{\mathbb{E}[v_r]} + \frac{2\theta_r(q_{e_2} - q_{e_1})(1 + \theta_r)}{-9q_{e_1} + 9q_{e_2}}$$

and

$$\beta = -\frac{q_{e_2}}{\mathbb{E}[v_e]} + \frac{4(q_{e_2} - q_{e_1})(2 - \theta_r)}{-9q_{e_1} + 9q_{e_2}} - \frac{9((q_{e_2} - q_{e_1})(2 - \theta_r))^2}{(-9q_{e_1} + 9q_{e_2})^2}$$

$$\beta = -\frac{(1 - q_{e_2})}{\mathbb{E}[v_r]} + \frac{2\theta_r(q_{e_2} - q_{e_1})(2 - \theta_r)}{-9q_{e_1} + 9q_{e_2}}$$

¹⁰I am thankful to Mireille Chiroleu-Assouline for insights about the model's solving

¹¹ $q_{e_1} + q_{r_1} = 1 \Leftrightarrow q_{r_1} = 1 - q_{e_1}$

Equating each multiplier expression and solving for q_{e_1} and q_{e_2} yield the following optimal quantities for each media:

$$q_{e_1}^* = \left[\frac{1}{\frac{1}{\mathbb{E}[v_e]} + \frac{1}{\mathbb{E}[v_r]}} \right] \left[\frac{1}{\mathbb{E}[v_r]} - \frac{(\theta + 1)^2}{9} \right]$$

$$q_{r_1}^* = 1 - q_{e_1}^*$$

$$q_{e_2}^* = \left[\frac{1}{\frac{1}{\mathbb{E}[v_e]} + \frac{1}{\mathbb{E}[v_r]}} \right] \left[\frac{1}{\mathbb{E}[v_r]} + \frac{(\theta - 2)^2}{9} \right]$$

$$q_{r_2}^* = 1 - q_{e_2}^*$$

These expressions highlight the different strategies of both media. In order to soften price competition, they provide to the readers different editing strategies. Therefore media 2, which we assumed is targeting readers with higher preferences for environmental news, proposes in its edition more environmental news than its competitor, media 1. On the other hand, media 1 which targets readers with low preferences for environmental news offers an edition with limited environmental news and more of the other type of news. This differentiation is illustrated in Figure ?? which display the optimal quantities of both media with respect to different values of θ_r ¹². The left panel represents the optimal choices of media 1 while the right panel represents the optimal choices of media 2. In both panels the plain line represents the optimal choice of environmental news while the dashed line represents the optimal choice of the other type of news. The figures show that although they have a different editing strategy, both react in the same way to an increase in θ_r (reader's taste for non-environmental news), as they both decrease their quantities of environmental news and increase their levels of non-environmental news. Therefore, since both medias are profit maximizing, their quantities of environmental news is decreasing the reader's taste for non-environmental news.

As for the state of the world in environmental news ($\mathbb{E}[v_e]$), we can see that under some conditions¹³, both medias increases their levels of environmental news in

¹²These figures were made with $\mathbb{E}[v_e] = \mathbb{E}[v_r] = 2$

¹³ $\mathbb{E}[v_r] < \frac{9}{(\theta_r + 1)^2}$ for media 1 and

$\mathbb{E}[v_r] < \frac{9}{(2 - \theta_r)^2}$ for media 2

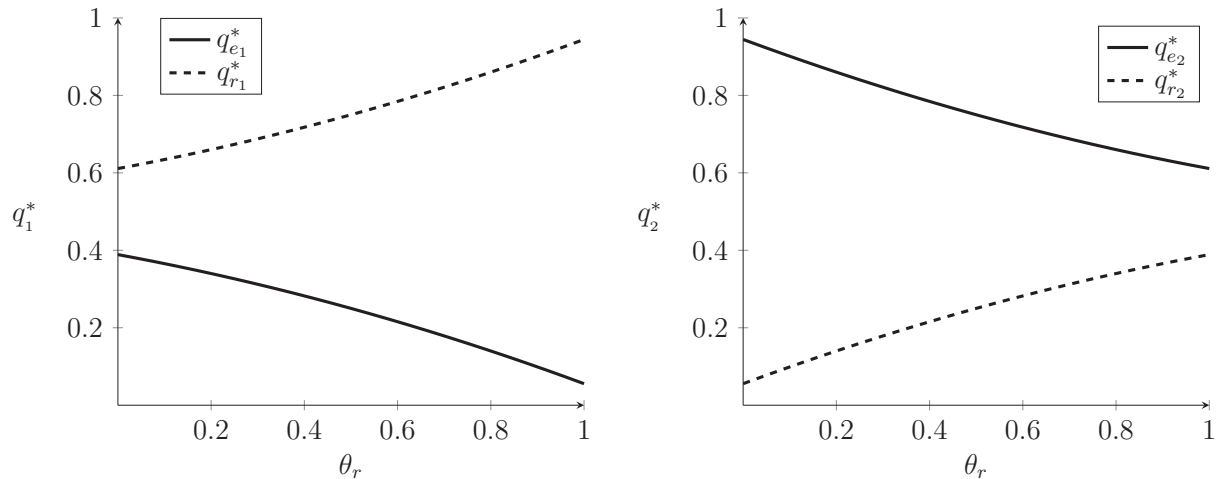


Figure 2.1: Optimal quantities of news

their edition¹⁴. But since they have a different editing strategy and target different audiences, their reaction to the same increase in $\mathbb{E}[v_e]$ is different. Because media 2 is focusing on readers with high preferences for environmental news, when $\mathbb{E}[v_e]$ increases (i.e. it is cheaper to produce environmental news) media 2 increase of environmental news is greater than the increase of environmental news of media 1. To summarize, the market equilibrium is as follow: there is differentiation in the editorial strategies of both media, one will specialize in environmental news while the other writes more non-environmental news. When there is a decrease in the cost of production of environmental news both media increase their quantities of environmental news, this increase is stronger for the media who initially writes more environmental news. Thus when environmental news is cheap to produce, the differentiation between the two media decreases because of the hypothesis of limited space for news. In the next section, we detail how the NGO can decrease the cost of producing environmental news.

¹⁴ $\frac{\partial q_{e1}^*}{\partial \mathbb{E}[v_e]} = \frac{-\frac{1}{\theta}(\theta+1)^2 + \frac{1}{R}}{E^2(\frac{1}{R} + \frac{1}{E})^2} \geq 0$ and $\frac{\partial q_{e2}^*}{\partial \mathbb{E}[v_e]} = \frac{\frac{1}{\theta}(\theta-2)^2 + \frac{1}{R}}{E^2(\frac{1}{R} + \frac{1}{E})^2} \geq 0$

NGO activities

The action space of the NGO is binary, that is she can either send the message $m = 0$ or $m = 1$. The first case we consider is the message $m = 0$. This case is straightforward because it fully reveals the type of the NGO who is sending it. Indeed, only a unbiased NGO will send this message in equilibrium. This is true because such signal drives the expectations of both medias of v_e down, which as shown in figure ??, leads to less quantities of environmental news. Such action would decrease the bad-cop/biased NGO payoff, therefore it should not send such message. Therefore medias know that when $m = 0$ the NGO is unbiased, therefore they assign probability $1 - \gamma$ to the state $v_e = \bar{v}_e$, because $1 - \gamma$ is the probability that the signal the NGO got is misleading. Therefore $\mathbb{E}[v_e|m = 0] = (1 - \gamma)\bar{v}_e$.

The message $m = \bar{v}_e$ does not reveal the type of the NGO. Thus medias update their beliefs using Bayes' rules

$$\mathbb{P}[v_e = \bar{v}_e|m = \bar{v}] = \frac{\alpha(\mu\gamma + (1 - \mu))}{\alpha(\mu\gamma + (1 - \mu)) + (1 - \alpha)(\mu(1 - \gamma) + (1 - \mu))}$$

Where α is their prior regarding $\mathbb{P}[v_e = \bar{v}_e]$, μ is the probability that the NGO's type is good-cop and γ is the precision of the signal of the NGO. If for simplicity we set $\alpha = 1/2$ then the posterior probability when the message received is $m = \bar{v}_e$ is the following:

$$\mathbb{P}[v_e = \bar{v}_e|m = \bar{v}_e] = \frac{\mu\gamma + 1 - \mu}{2 - \mu}$$

Which leads to an updated evaluation of the expected value of v_e :

$$\mathbb{E}[v_e|m = \bar{v}_e] = \bar{v}_e \frac{\mu\gamma + 1 - \mu}{2 - \mu} \quad (2.2)$$

Notice that as long, in this particular case, as $\gamma > 1/2$ then $\mathbb{P}[v_e = \bar{v}_e|m = \bar{v}_e] > 1/2$. Therefore, as long as the signal is correlated with the true state of nature, when receiving the message $m = \bar{v}_e$ the medias posteriors probabilities on the state of the world in environmental news being $v_e = \bar{v}_e$ are greater than their priors. Which means that the medias believe that some newsworthy event happens in the environmental domain, which leads to cheaper news production cost. Moreover, this

increase in the posterior probabilities is an increasing function of the precision of the signal of the NGO¹⁵.

Knowing how the media update their beliefs on the state of the world in environmental news with the NGO message, we now need to see how the medias change their quantities of environmental news. We focus on cases where both media fill all their available space. Therefore at any equilibrium we have $q_{e_i} + q_{r_i} = 1, \forall i \in \{1, 2\}$. The change of quantities when there is a change in the cost of producing environmental news is presented in figure ???. The figure shows that when $E[v_e]$ increases (environmental news is cheaper to produce) both media increase their quantities of environmental news and thus produce less non-environmental news. It also shows that the media which initially write more environmental news reacts more to a change in the production cost

Knowing how medias react to different messages, we can express the strategies of the two types of NGO. The bad cop type is straightforward as it only cares about the quantities of environmental news. It should therefore never send a message that would decrease the level of environmental news ($m = 0$). Thus this type of NGO is in a babbling equilibrium where its message is independent of the signal it receives. Its dominant strategy is to always send $m = \bar{v}_e$.

The good-cop type is more subtle as its objective function is more aligned with a representative reader since it not only cares about the quantities of environmental news, but also about the quantities of the other type of news. Therefore its message is dependent on the signal it receives. When the NGO receives the signal $s = 1$, it has no incentives to lie and send the message $m = 0$, because it would lead the medias to decrease their quantities of news while there are some newsworthy events happening. Thus its optimal strategy is $m^*(s = 1) = \bar{v}_e$. When the signal received is $s = 0$, the good-cop NGO faces two choices: its message can be truth-telling and reveals the true state of nature or it could lie and sends a message that's the oppo-

¹⁵ $\frac{\partial \mathbb{E}[v_e | m = \bar{v}_e]}{\partial \gamma} > 0$

site to the signal it receives in the first place. In the truth-telling case medias revise downward their prior on the state of the world on environmental news and therefore write less environmental news and fill this gap with more non-environmental news. In the lying case, the media revise upward their expectations on the state of the world in environmental news and therefore write more environmental news and thus less non-environmental news. The way the good-cop NGO value these changes in terms of utility determine which signal it sends when $s = 0$. The good-cop NGO sends a truth-telling message only if:

$$\theta_{e_g} \Delta \mathbf{q}_e \leq \theta_{r_g} \Delta \mathbf{q}_r^{16}$$

Since we know that $\Delta \mathbf{q}_e = -\Delta \mathbf{q}_r^{17}$, the choice of the message is determined by the weight the good-cop NGO put on each type of news. If it values more the environmental news, then it will lie and send a non truth-telling message: $m^*(s = 0) = \bar{v}_e$. On the contrary, if the NGO values more non environmental news than environmental news, then it will send a truth-telling message: $m^*(s = 0) = 0$. Therefore even the good-cop NGO has incentives to lie when it sends a message to medias. This incentive rely in the fact that when doing their updating when $m = 0$, medias decrease their quantities of environmental news and replace this available space in their edition by some other type of news. It is worth noting that this lying result hold because we assume no lying cost. However it is realistic to assume that sending a false message to media is a costly activity as it require to forge information (Dewatripont and Tirole (1999)). However, we do not account for this in this simple set up. In this simple set up we see that both type of NGO have an incentive to always send the message $m^* = \bar{v}_e$. Therefore both media would revise downward their priors about the cost of environmental news and increase their quantities of environmental news. Therefore a message $m = \bar{v}_e$ is followed by an increase in quantities of environmental news for both media.

¹⁶Where $\Delta \mathbf{q}_e = \mathbf{q}_e(m = \bar{v}_e) - \mathbf{q}_e(m = 0)$ and $\Delta \mathbf{q}_r = \mathbf{q}_r(m = \bar{v}_e) - \mathbf{q}_r(m = 0)$

¹⁷We do so because of the limited space assumption

Summary: Empirical Predictions

This simple model presented above generates a set of testable results that we present here. From this model we want to test the reaction of medias to NGO activity. The behavior we look at is the change in the quantity of environmental articles following an NGO activity. In our data, this behavior is whether or not an NGO is mentioned in an article. Therefore our dependent variable is the fact that an NGO i is featured in an article in media m at date t . Using a set of explanatory variables we want to investigate the results of the comparative statics that we summarize below

Media Reaction to NGO Activity: as shown in the subsection above, we should see that when the signal's precision of the NGO increases, the media coverage of the NGO should increase too. We use as a proxy for the signal's precision of the NGO the mention or not of the NGO in a Reuters dispatch. Because if an NGO is featured in a Reuters dispatch, this indicates that the NGO activity as real informativeness value and thus can be interpreted as a higher signal precision. Using a dummy variable for the presence or not of an NGO in Reuters dispatches we can test the impact of an increase in the NGOs signal's precision.

We should also see different reaction to such increase in signal's precision, as we see that there is complementarity between the signal's precision and the NGO's probability of being unbiased. Therefore, NGOs with high probability of being unbiased should be more covered when the precision of their signal increase. Combining NGOs fixed effect with their mention in Reuters dispatches we could see if there are different reactions.

In the next section, I describe how I created my dataset from french newspaper and french NGO activities and then test those hypothesis.

2.4 Empirics

The previous section emphasized that differentiation in media markets is a function of reader's taste and that when faced with a environmental newsworthy event, media will cover the story differently. In this empirical section, we use data from french NGOs and newspaper to verify whether or not the theoretical model leads to correct implications. All these data are public yet only accessible through web-scraping techniques, which allow to gather data from internet at a large scale (A short presentation is given in the appendix). To do so we focused on 2 french daily newspaper *Le Monde* and *Le Figaro*. Because of technical restrictions *Libération* was not included. Using webscraping technique we focus on their editorial choices and how they cover environmental NGO activities from the 1^{rst} January 2013 to the 31^{rst} December 2015. we focus on these 2 medias because they are among the biggest french daily newspapers (in terms of sale) and are distributed at the national level. This make them rather similar in terms of the size of their readership¹⁸. They are of interest because both have different ideological bias: *Le Monde* is usually considered as a relatively unbiased newspaper while *Le Figaro* is more right-oriented. We consider these medias as rather similar in terms of size and therefore in terms of capacity of writing articles. As they are big newspapers the choice to cover or not a story should not be the result of a lack of resource but rather an editorial choice. Therefore they should strategically choose which quantities of type of news they feature in their edition. We do not focus on the ideological content of the articles, just on their quantities. Facing a heterogeneous audience, we expect that they differ in their choice of quantity of environmental news, and thus in their coverage of NGO activities. The next subsections describe the variable I use in my estimations

¹⁸Although Le Figaro has more diffusion than Le Monde (see: www.acpm.fr/Support/le-figaro and www.acpm.fr/Support/le-monde)

Outcome variable: media coverage of NGO

What we consider as media coverage is simply whether or not the NGO's name is mentioned in an article. Using a finite sample of influential NGO (WWF France, Greenpeace France, Les Amis de la Terre, Réseau Action Climat and Sea Shepherd France) we conducted a web-search on the website of both media using the name of the NGO and scraped the results. These results were every articles in both media mentioning the name of the NGO. Sorting the results by date and by media allows us to have per day and per media the coverage of those environmental NGO by the 2 medias. Our outcome variable is therefore binary, so what in the model we called an increase of environmental articles here will be an increase in the probability that the NGO is featured in the newspaper.

Explanatory variables

Our set of control variables includes 2 sets of variables, one that is common to all, and one that is specific to each organizations.

The first set of variables tries to capture the activity that is not due to the NGOs. To control for media fixed effects, we construct a dummy variable for the newspaper *Le Monde*. To control for the input of all types of news, we scraped from Reuters website all dispatch that were issued during my time windows. To control for the apparition of environmental newsworthy events we also got the Reuters dispatches over that time period. Using keyword searches we could isolate the dispatches that where related to environmental issues (The procedure is presented in the appendix). we then construct a relative measure of the importance of other dispatches compared to environmental dispatches. To measure for institutional activity on environmental issues we used the activities that were posted on the website of the French ministry of environment as a proxy for environmental governmental environmental activity. We controlled for the presence of the french ministry of environment in both media. As over our period of study there were some important environmental and non-

environmental events (Paris attacks, 3 COP conferences,...) we controlled for these events using dummies.

The second set of variables describes the activities of the NGOs. We used the website of these organization as the source of information. More specifically we used the *Activity* section of their website and scraped the information these pages contain to get their activities. This allows us to have per day their activities. To control for the informativeness of their activities we look for their names in Reuters dispatches. Using the names of the NGO as term in keyword search we could extract the dispatches that mentioned each NGO. In the end, the equation we want to estimate is the following:

$$Y_{imt} = \beta_0 + \beta_1 Activ_{it} + \beta_2 Reuters_{it} + \beta_3 Media_m + \beta_4 Reuters_enviro_t + \beta_5 Gov_activ_t + \theta Fixed_effect_i + \varepsilon_{imt},$$

where i is an NGO, m a media, and t a day. $Activ_{it}$ is the activity of NGO i at day t , $Reuters_{it}$ is Reuters dispatch mentioning NGO i at day t . $Media_m$ is a dummy controlling for media fixed effect. $Reuters_enviro_t$ is the number of Reuters dispatch which mention environmental issues (minus the $Reuters_{it}$). $Fixed_effect_i$ is simply a dummy variable that control for any fixed effects related to each NGO. We use several regression methods in order to estimate the equation above. The first set of regression is simply a Logit regression in order to explicit the variables that have a significant impact on the fact that an NGO is mentioned in a newspaper or not. Due to the nature of the dependent variable Y_{imt} , I then turn to count regression method to confirm or not the results from the binary regressions. In both the Logit and Poisson regression I rely on heteroskedasticity-robust standard errors that are clustered at the NGO-level (Bertrand et al. (2002)). However, the statistical inference based on these standard error is incorrect as the number of cluster is too small. There are only 5 NGOs in my sample therefore I use the wild-t cluster bootstrap method of Cameron et al. (2011) to construct reliable p -values.

Results

In this section, I present the results from basic estimation of equation to be estimated. These results are presented in Table 2.3. Each column present a different regression results with more and more control being included.

In all regressions, I find that NGO internet activity is positively correlated with the probability that the NGO is covered in newspapers. This very intuitive result can be explained by the relative low heterogeneity in my NGO sample. Indeed my sample only covers 5 relatively well known french NGO. Thus because these NGO are well known, it is relatively normal to see that their activities are covered by newspaper. From column (3) to (6) I included lagged values of these activities in order to check the timing dimension of NGO coverage. The activity at $t - 1$ does positively influence the coverage of NGO at time t but not the activities at $t - 2$. This is evidence of that media report recent news. Thus if an activity goes unnoticed the day it happened, there are great chances that it remain uncovered.

The *Le Monde* coefficient stands for the differentiation parameter. If it would be not significant, then there would be no differences in NGO coverage between *Le Monde* and *Le Figaro*. However, this coefficient is significant in all regressions, thus indicating that there is difference that in the NGO coverage between *Le Monde* and *Le Figaro*. These regressions show is that *Le Monde* significantly covers more NGO activity than *Le Figaro*.

Another hypothesis to be tested is how an increase in the precision of the signal of the NGO influences its coverage. This increase in the signal precision is captured in the variable *Reuters NGO*. This coefficient is significant in all regressions, thus when an NGO is featured in a Reuters dispatch, this greatly raises the probability that it will be covered in both newspapers.

Then I control for the occurrence of environmental news using the Reuters Environment coefficient. Both present and lagged coefficients are significant, it means that environmental Reuters dispatches increase the likelihood that an NGO is featured

in a newspaper. A possible explanation for this result is that NGOs are present in medias when there are environmental newsworthy event because they ask for them to comment, give their opinion on these events. If this is true, this behavior is amplified because of the nature of the NGO covered in my sample. Because I cover few well known NGOs there are more likely to be feature in environmental news than any other NGO.

The fixed effects coefficients of the NGO are presented in table ???. The reference NGO is *Réseau Action Climat*, we see that the NGOs differ significantly in terms of coverage as Greenpeace and WWF are positively and significantly more covered than the other 3 NGOs in my sample while *Les Amis de la Terre* are significantly less covered than the reference NGO.

2.5 Conclusion

The theoretical model explicitly shows the difficulty for environmental NGO to be featured in the media. This feature comes from the fact that readers want to read not just environmental news, but also other types of news. And that all these news compete for getting into the media, which has a limited space. In this setting, NGOs are likely to be featured in the media if they provide extreme news (high v_e) and when other types of news do not have a newsworthy events (low v_r), This effect is stronger, the stronger are the preferences of the reader for environmental news. We show that when media compete on the market for news, NGO's action will be more reported in the media that initially publish more environmental stories rather than in the media that targets individuals with low valuation for environmental news. The empirical investigation shows that *Le Monde* and *Le Figaro* differentiate themselves on the environmental news segment and that they both react differently to NGO activities. I show that a great determinant of the coverage of NGO activities is to featured in a Reuters dispatch. That is that when the NGO activity is considered as a newsworthy event which significantly decreases the cost of producing environmental news. I also

NGO	Le Monde	Le Figaro	Reuters	Internet Activity
Amis de la Terre	0.038	0.015	0.001	0.263
Réseau Action Climat	0.06	0.014	0	0.111
Greenpeace Fr	0.376	0.045	0.025	0.307
WWF	0.148	0.045	0.006	0.166
Sea Shepherd Fr	0.051	0.024	0	0.326
<i>N</i>	972	972	972	972

Table 2.1: Mean articles/activity per day

show that there are differences in NGO coverage, as some NGO are significantly more covered than other. Further analysis on the different kind of activities (protest, press conference, study release,...) made by the NGOs is required to determine the reasons of these differences.

Appendix Keywords

Keywords used to isolate environmental dispatches from Reuters: "environnement", "pollution", "climat", "énergie", "forêt", "flore", "déchets", "recyclage", "planète", "renouvelable", "serre", "nucléaire", "diesel", "t". Each dispatch from the raw dataset which had a match with one of the keyword was marked. To ensure that the final dataset contains as little noise as possible, I only kept the dispatches which had at least 2 matches with the keyword list above, which gives a final sample of 383 dispatches from a raw set of 18020 dispatches.

	Ministry activity	Reuters environment	Reuters total
Mean	1.987	0.394	18.525
N	972	972	972

Table 2.2: Descriptive statistics

Appendix Tables

Appendix: Web-Scraping

In this section I present the tools I used in order to construct my dataset. All data are available on internet however I used web-scraping techniques that allowed me to select relevant information from the webpages.

I do so using a python script that select relevant information from the html page I am interested in. This information is figure 2.2 as it shows how the relevant information from WWF website can be found using the html code. From this I can easily get the date, title and text of the actuality. Repeating this procedure for all the actuality on the website allowed me to get the activity posted from the 1^{rst} of January 2013 to the 31th of December 2015. I then adapted my script to Greenpeace, Les Amis de la Terre, Sea Shepherd, Réseau Action Climat websites in order to get all the activities of these organizations.

In order to do have the media coverage of these organizations I used the media's website search engine (from *Le Monde* and *Le Figaro*). That is I wrote in their search bar the name of each organization. The website then provided me with the all the articles containing the organization's name in all their editions. Using the same tools as before I could get all the information needed about the coverage of these NGOs (date of article, title). I then applied the same technique to get Reuters dispatches over the time period I studied. Merging these data together and sort them by days allowed me to construct my final dataset. (Codes available upon re-

Table 2.3: Regression Table

<i>Dependent variable: Media Coverage or not</i>						
	(1)	(2)	(3)	(4)	(5)	(6)
Activity Internet	0.456*** (0.100)	0.439*** (0.035)	0.410*** (0.075)	0.406*** (0.038)	0.402*** (0.072)	0.396*** (0.037)
Reuters NGO	2.477*** (0.772)	1.848*** (0.600)	2.303*** (0.754)	1.767*** (0.573)	2.292*** (0.760)	1.754*** (0.583)
Le Monde	1.535*** (0.273)	1.585*** (0.299)	1.544*** (0.295)	1.592*** (0.303)	1.528*** (0.293)	1.575*** (0.298)
Reuters Environment	0.188** (0.077)	0.198** (0.077)	0.155** (0.076)	0.165** (0.078)	0.147* (0.075)	0.156** (0.077)
Activity Ministry	0.022** (0.010)	0.023** (0.011)	0.021** (0.010)	0.022 (0.014)	0.020** (0.010)	0.021 (0.014)
Activity Internet $t + 1$			0.124 (0.121)	0.086 (0.075)	0.121 (0.122)	0.082 (0.077)
Activity Internet $t - 1$			0.136* (0.077)	0.107*** (0.017)	0.130* (0.076)	0.099*** (0.019)
Activity Internet $t - 2$			0.182* (0.100)	0.156 (0.111)	0.182* (0.099)	0.156 (0.109)
Reuters NGO $t - 1$			1.048 (0.707)	0.526 (0.517)	1.063 (0.699)	0.542 (0.510)
Reuters Environment $t - 1$			0.141*** (0.048)	0.147*** (0.042)	0.138*** (0.049)	0.145*** (0.042)
Ministry Newspaper					0.024 (0.017)	0.026 (0.022)
Constant	-3.850*** (0.173)	-4.671*** (0.369)	-4.028*** (0.192)	-4.819*** (0.351)	-4.047*** (0.199)	-4.842*** (0.350)
NGO fixed effects	No	Yes	No	Yes	No	Yes

Note:

*p<0.1; **p<0.05; ***p<0.01

Table 2.4: Fixed Effects Coefficients

	(1)	(2)	(3)
Greenpeace	1.657*** (0.438)	1.620*** (0.439)	1.625*** (0.438)
WWF	1.060*** (0.175)	1.071*** (0.174)	1.071*** (0.173)
RAC	0.351*** (0.135)	0.394*** (0.130)	0.393*** (0.130)
Sea Shepherd	-0.060 (0.059)	-0.089* (0.046)	-0.083* (0.046)

Note:

*p<0.1; **p<0.05; ***p<0.01

Table 2.5: Interaction Activity*NGO Fixed Effect

	Estimate	Std. Error	z value	Pr(> z)
Activity Internet _{it}	0.395***	0.082	4.823	0.00000
Activity Internet _{it} *Greenpeace	-0.013	0.202	-0.062	0.951
Greenpeace	1.630***	0.373	4.370	0.00001
Activity Internet _{it}	0.429***	0.093	4.633	0.00000
Activity Internet _{it} *WWF	-0.169	0.246	-0.685	0.494
WWF	1.112***	0.246	4.528	0.00001
Activity Internet _{it}	0.379***	0.043	8.865	0
Activity Internet _{it} *RAC	0.157*	0.066	2.372	0.018
RAC	0.357**	0.122	2.928	0.003
Activity Internet _{it}	0.409***	0.044	9.384	0
Activity Internet _{it} *Sea Shepherd	-0.115	0.126	-0.915	0.360
Sea Shepherd	-0.033	0.093	-0.356	0.722

quest)



Figure 2.2: WWF actuality html

Chapter 3

Activism and Regulation

3.1 Introduction

In 2014 a dam project in Sivens faced an intense mobilization by environmental activists. The project, which was accepted by the local regulator, would create a water reserve for irrigation of 40 hectare. However, the construction would destroy 13 hectare of "*remarkable*" humid area. Already in 2011, an organization was created to oppose the project: Collectif pour la sauvegarde de la zone humide du TESTET. This NGO claimed that the project was oversized with high environmental and financial costs and was reserved to agricultural practices that are inappropriate for farmers as well as for society¹. Although the project planned compensatory environmental measures such as the creation of new 19.5 hectares of humid area and the moving of protected species, these measures were not considered satisfactory by the environmentalists who continued in their opposition to the project. In 2014 the opposition intensified with the occupation of the construction site by activists that led to multiple confrontation with police forces, eventually leading to the death of an activist. Facing such mobilization, the government mandated a report on the dam project. The authors of the report criticized multiple aspects of the project²: the fact that no alternative projects were really considered, the oversizing of the project, its financing,... Combined with the intense mobilization, this led the government to stop the project and finally to abandon it in December 2015³. It has been replaced by another dam twice as small as the initial one, and more environmental compensating measures are planned in order to counter balance the externalities from the construction of the dam.

The main component of this situation is the interaction between a regulator and

¹www.lemonde.fr/planete/article/2014/09/03/dans-le-tarn-l-opposition-se-renforce-contre-un-barrage-menacant-une-zone-humide_44813302_3244.html

²www.lemonde.fr/planete/article/2014/10/27/le-gouvernement-rattrape-par-le-barrage-de-sivens_4512985_3244.html

³www.lemonde.fr/planete/article/2015/12/27/le-projet-initial-du-barrage-de-sivens-definitivement-abandonne_4838386_3244.html

activists over a project. The following paper aims at analyzing such interaction. I propose a model that features such interaction between these two players. The regulator has to accept or refuse a project. This project provides profits for some industry but has environmental externalities. The regulator values the benefits for the industry and the environmental externalities with different weights. It is biased in the sense that the weight on the industry's profit is greater than the environmental externalities. This bias illustrates the tendency of the regulator to accept oversized projects as presented above. This bias causes it to accept non optimal projects. Activists observe the potential environmental externalities if the project is accepted and decide whether or not to mobilize against the project. Activists are heterogeneous strategic individuals who decide whether or not to join the mobilization against the project. The mobilization causes some damages to the industry and if they are too big the regulator withdraws the project. Thus the key element is whether or not enough activists participate to the mobilization.

Anticipating the mobilization and its consequences, the regulator's choice is to accept or not the project. It uses its biased welfare function to do so. This framework illustrates the double-edged sword characteristic of activists mobilization as their impact can either be welfare improving or welfare decreasing. Indeed if the mobilization is successful as it disciplines the biased regulator and forces it to refuse project with high externalities, then the activists are welfare improving. However, if the mobilization is not strong enough, then the activists decrease the welfare, as the project with environmental externalities is still accepted, and their mobilization caused some damages to the industry.

Moreover, this model shows that such mobilizations are more likely to occur when there is strong regulatory capture. Because a strongly captured regulator will be more likely to accept projects with strong environmental externalities, as it would put more weight on the industry benefits rather than on those losses. These choices would trigger mobilization, however, these mobilizations would be unlikely to be successful, because although they would cause damage to the industry, the regulator

still accepts the project. Another source of mobilization comes from the preference of the activists. This is the amount of environmental externalities that they are willing to experience before they feel aggrievement (the tolerance threshold). As this threshold gets lower, activists are more willing to mobilize. Thus, in settings with very sensible activists, mobilization is very likely to be successful because the environmental externalities of a project would create lots of aggrievement which ease the participation to the mobilization. Also this model shows that heterogeneity among activists slows down mobilization. Thus homogeneous activists are more likely to be successful than heterogeneous activists.

Regarding the welfare impact of mobilization, this model yields 2 opposite results as activism can be welfare improving or welfare decreasing. The reason why activism can be welfare improving is the following: the regulator choose to refuse the non optimal project in anticipation of the massive mobilization and its consequences, therefore it is preferable to refuse the project. When mobilization is not welfare improving, it means that the damages of the mobilization are not high enough so the project is accepted. The environmental externalities happen and the activists do some damages to the industry thus lowering even more the welfare.

3.2 Literature Review

This model relies on several previous studies. The first one is Daubanes and Rochet (2016), who also study the interaction between a biased regulator and a NGO. They discuss the cases where the NGO opposition to a project is socially-preferable or not. In their model, the industry can make lobbying expenditures in order to increase regulatory capture, a feature which I do not consider. Thus in their model, the industry can react to the mobilization whereas in my model, the industry is passive. However, they consider the NGO as a single entity which ensures that NGO mobilization is always effective. I release this hypothesis and consider a continuum

of heterogeneous activists instead of a single NGO. In order to model mobilization, I rely on the Passarelli and Tabellini (2013) framework. They model how a regulator adapts its policy when it faces several groups that can riot. In their model, each individual in a group individually decides whether or not to participate to the riot. A feature that is present in my model. Riots cause damages and in order to mitigate those damages, the regulator revises its policy so the groups who cause more damages do not riot. In this framework, activists riot because of the distance between their preferred policy and the actual policy. If the policy level is below the preferred one, then they feel aggrievement. However if the policy level is above the preferred one, then they do not feel aggrievement. This aggrievement mechanism is similar to how anger is formalized in games as in Battigalli et al. (2015). In this paper, this aggrievement mechanism is adapted to environmental externalities. Thus if the environmental externalities are below some tolerance level, the activists do not feel aggrievement or anger. However, if the externalities are above this threshold, then the activists will get angry or feel aggrievement which later fuels their participation to the mobilization. Aggrievement is not the only factor that motivate activists to participate to the mobilization, there is also the number of activists who participate. This model assumes there is complementarity between activists mobilization. Thus the benefit from joining mobilization is increasing in the number of activists who already take part to the mobilization. This hypothesis creates a dynamic among activists that help to overcome the collective action problem to participate to the mobilization. Empirically, this is supported by Klandermans (2002). It shows that if people identify to a group that they think is treated unjustly, then they are more likely to participate in protest. The unjustified treatment is modeled here as the environmental externalities since greater environmental externalities fuel mobilization participation. The group identity assumption is related to the complementarity between activists mobilization. As a greater sense of group identity ease mobilization. Here this is present with the complementarity between participation efforts. Although this paper uses theoretical tools, some papers have focused on the same

question using empirical investigation. Notably Madestam et al. (2013) which studies the impact of tea-party protests in the US. They unveil the causal relation of tea-party protests on policymaking and citizen political behavior. They show that incumbents in districts with large protests voted more conservatively in Congress. Moreover, greater tea-party protests were associated with greater number of republican votes. Thus protests had an effect on both incumbent behavior and election outcomes. Sociologists also have long focused on this matter: a review of most of these studies can be found in Amenta et al. (2010). Agnone (2007) focus on the environmental movement in the US, it shows that protests from the environmental movement had a positive impact on the number of environmental laws. This result was tempered by Olzak and Soule (2009) who showed that environmental protest only had an impact on environmental hearings.

Other models have focused on the relation between green lobbying and political decisions such as List and Sturm (2004), Yu (2005) or Conconi (2003). However my model depart from these on two points: I do not consider the environmental NGO as a single entity and do not consider that the polluting industry can lobby. The reason for this is that my focus is specifically on the relation between activists and a regulator and how activists decide to mobilize. This model differs from Passarelli and Tabellini (2013) because I consider the welfare impact of activism. It also differs from Daubanes and Rochet (2016) because I consider NGO opposition to a project as the sum of the actions of heterogeneous agents, therefore releasing the hypothesis of modeling an NGO as a single entity. I now present the baseline framework in which I develop these mechanisms.

3.3 Activism and Regulation: Set Up

We consider an economy composed of a regulator, activists and an industry represented by a single firm. Below we describe each actor's objective function and actions.

Regulator

We consider that the regulator values the utility of activists and the profit of the firm. He is faced with the choice of accepting or not a project that is proposed by the industry. If implemented, such project, which is characterized by its size b generates both a private value vb that is enjoyed by the industry alone and a total cost cb that is borne by the all society. However there is uncertainty regarding to the cost, either the project is good and either the project is bad as described below.

$$\left\{ \begin{array}{l} \text{With probability } p_L \text{ the project is good with } c = c_L < v \\ \text{With probability } p_H \text{ the project is bad with } c = c_H > v \end{array} \right.$$

Therefore the expected cost of a project is $\mathbb{E}[c] = b(p_L c_L + p_H c_H)$. We assume that the regulator observes the true value of the cost of the project⁴. Therefore the optimal choice would to accept the project if the benefits are greater than the costs. However, as stressed in the introduction, we focus on cases where the regulator does not pick the first option when faced with the choice of accepting or not a project. We focus on the case of regulatory capture that is when the regulator is biased in favor of the industry⁵, as in Daubanes and Rochet (2016). We model this bias by assuming that the regulator puts a greater weight on the industry benefits than on the rest of the society surplus. He thus pursue the following biased welfare function⁶

$$V = (1 + \alpha)\Pi + U = (1 + \alpha)vb - cb$$

Based on this welfare function and the information about c , the regulator accepts or not the project.

⁴In France, since 2013, public projects must have an *ex-ante* socio-economic evaluation which take into account various environmental externalities, see Quinet et al. (2014)

⁵In the Sivens case, it would mean being biased in favor of farmers

⁶The unbiased welfare function is given by $W = \Pi + U$

Activists and Industry

There is a mass 1 of heterogeneous activists. When the project is adopted by the regulator, each activist assesses his external cost and decides whether to oppose or not. The opposition to the project translates into a mobilization. It is characterized by a loss h that is inflicted to the industry and which is endogenously determined. Facing mobilization, the industry can always self-regulate. Anticipating an intensity of mobilization h the firm can decide whether to abandon or continue the project. If the firm abandons the project, nothing else happens. If the firm continues, then the activists protest and inflict some damages to the industry while the project is implemented.

Timeline

The timing of the game is follow:

1. The industry proposes a project to the regulator, the regulator observes the true cost of the project⁷ and decides to accept it or not
2. Activists use the expected cost to make their decision to mobilize or not
3. Anticipating the mobilization the industry can decide to abandon or continue the project
4. If the industry continue the project, then the mobilization takes place and the loss h is inflicted to the industry's profit

The timing of the game is pictured in figure 3.1. We proceed by backward induction, thus focusing first on the industry decision at the last stage of the game.

⁷It could learn it through expertise, cost benefit analysis

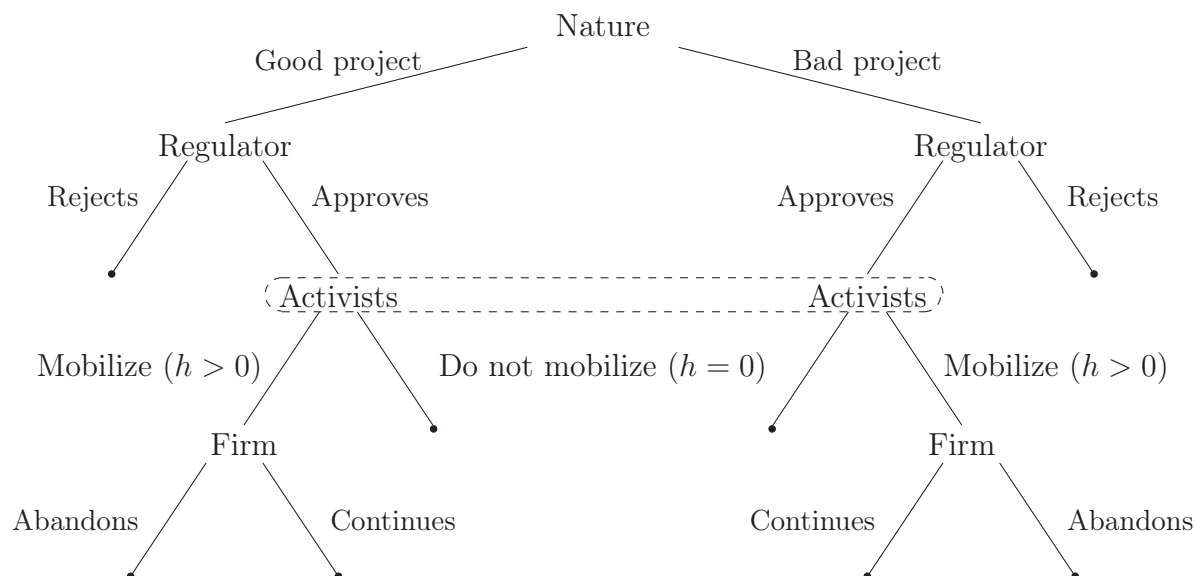


Figure 3.1: Game form

Solving the Model

The Industry Decision

Given that activists mobilize and provoke a specific damage h , the industry must decide whether or not it concedes to the campaign or not. To do so, it simply compares the two outcomes and chooses the best option for its profits. The outcomes are given below.

$$\max(vb - h; 0)$$

For the industry to concede to the campaign, the harm must be higher than a specific threshold $\bar{h} \equiv vb$

Thus if the activists mobilize such that their mobilization inflicts a damage $h > \bar{h}$, their mobilization would be successful as the firm would concede to them. However if their mobilization is not strong enough, the industry will forgo and launch its project. Thus the strategy of the industry here depends on the endogenous harm by the activists.

Therefore activist mobilization is not always successful which is a departure from Daubanes and Rochet (2016), as in their model they assume that activist mobilization is always successful, and thus the threat of mobilization is high enough for the industry to abandon the project. As it is shown below, the magnitude of the mobilization is due its endogenous mechanism and the heterogeneity among activists.

Activists

We focus now on the activist's decisions on the endogenous determination of the loss inflicted to the industry. We assume that each activists strategically decides to participate or not to the mobilization. We present below the mobilization mechanism and determine the equilibrium mobilization level.

We use is the same mobilization mechanism as described in Passarelli and Tabellini (2013). For simplicity, we consider the case where there is only one group of activists, and focus on the decision of an activist i . An activist receives a psychological benefit from joining the action denoted a . It captures the level of anger of the activists (aggravement). It is the same across all individuals and is formally presented later. Joining mobilization also entails costs. We model these as the sum of two components: $\mu + \varepsilon^i$. The parameter $\mu > 0$ is known and common to all groups and individuals. The term ε^i is a random variable that capture individual component of the cost or benefit of participation. I assume that ε^i is uniformly distributed with mean 0 over the support $[-x, x]$ ⁸. The spread of this random variable reflect the heterogeneity in opportunity cost of participating to the mobilization. It means that in the same group, some individuals experience additional benefit to participating to the mobilization while some pay a cost. I also assume there is complementarity in the participation of activists. This means that as more and more activists join the mobilization, their utility from doing so increase. This refers to a group identity utility bonus, as activists experience a greater level of utility when other

⁸Therefore it has density $\frac{1}{2x}$ over this support

activists join their mobilization. Evidences of this phenomenon among protest participants are presented in Klandermans (2002). Formally this means that the benefit of participation grows proportionately with the number of other group members also participating in the riot, p . Combining these assumptions, individual i chooses to join the action if benefits are larger than costs:

$$pa - \mu - \varepsilon^i \geq 0$$

A realization $\varepsilon^i < -\mu$, which occurs with probability $F(-\mu)$, which means that individual i draws positive utility from engaging in an action, even if nobody participates (i.e. $p = 0$). These are called extremists. The fraction of individuals who participate is thus given by:

$$p = Pr(\varepsilon^i \leq pa - \mu) \equiv F(pa - \mu) \quad (3.1)$$

The equilibrium participation rate, p^* is a fixed point of (3.1). As $\varepsilon \sim U[-x, x]$, where $x > 0$,⁹ we can express the equilibrium level of participation as follow:

$$p^* - F[p^*a - \mu] = 0 \Leftrightarrow p^* - \frac{p^*a - \mu + x}{2x} = 0$$

Which yields:

$$p^* = \frac{x - \mu}{2x - a} \quad (3.2)$$

In order to have $1 > p^* > 0$, we impose $x > Max[\mu, a - \mu]$. Equation (3.2) highlights that participation increases at an increasing rate with aggrivements¹⁰. Therefore we should observe stronger mobilization when projects create high levels of aggrivement among activists. The mechanism by which a project creates aggrivement is presented below. Knowing how participation evolves with aggrivement, we now want to see how participation evolves with population heterogeneity. A proxy for population heterogeneity is the domain of distribution of the random variable ε (x)

⁹We also assume that $x > \mu$, therefore there is always a positive mass of extreme activists who are willing to engage in mobilization even if no one does.

¹⁰ $\frac{\partial p^*}{\partial a} > 0$ and $\frac{\partial^2 p^*}{\partial a^2} > 0$

which captures individual component of the cost or benefit of participation to the mobilization. It turns out that heterogeneity have two opposite effects depending on the aggrivement level of the activists. We have that $\frac{\partial p^*}{\partial x} > 0$ if $a < 2\mu$ and $\frac{\partial p^*}{\partial x} < 0$ if $a > 2\mu$ ¹¹. Hence for groups with low levels of aggrivements, heterogeneity boots mobilization participation while for groups with greater levels of aggrivement, heterogeneity decreases participation. This result is due to the way heterogeneity is modeled. An increase in heterogeneity means that the support of ε is greater. Thus this creates activists profile with great utility from mobilization and some activists with great costs of mobilization. When aggrivement level is low, the former effect is stronger than the later on the equilibrium level of participation while the opposite happens when aggrivement level is high among activists. We next turn to the mechanism responsible for aggrivement, which is the principal reason why activists mobilize. We rely of the Passarelli and Tabellini (2013) mechanism framework and adapt it to our model. We keep the argument of Passarelli and Tabellini (2013) that aggrivements are created by some distance between a focal point of the activists and some variable. Here the distance that is responsible for aggrivement is the difference between the expected cost of the project and some focal point. This focal point is the maximum cost of the project that activists are willing to accept before they experience aggrivement. In the Sivens case, this limit would be the maximum level of environmental externalities that activists accept from the dam construction. The focal point is common to all individuals. If the cost of the project falls below this point, then activists do not feel aggrivement and there is no mobilization, however if the cost is above this threshold, then activists experience aggrivement and mobilization may occurs. This mechanism is formally presented below:

$$a = \begin{cases} 0 & \text{if } \mathbb{E}[c] \leq \bar{c} \\ \frac{1}{2}(\mathbb{E}[c] - \bar{c})^2 & \text{if } \mathbb{E}[c] > \bar{c} \end{cases}$$

Thus the industry affects activism and participation through the effect of the expected cost of the project on aggrivement. With this formulation, aggrivement

¹¹ $\frac{\partial p^*}{\partial x} = \frac{2\mu - a}{(2x - a)^2}$

increases at an increasing rate in the expected cost of the project. Hence projects with high probabilities of being bad¹² will be very likely to face mobilization. Our relationship between aggrievement and participation is very similar to the relationship between frustration and anger in Battigalli et al. (2015). That is that aggrievement fuels the participation of activists, as they feel aggrievement, they also have greater incentives to participate to the mobilization. Aggrievement also decreases in the threshold level of activists (\bar{c}). This threshold captures the level of damages activists are willing to tolerate before they start to feel anger. The lower this threshold, the quicker activists feel aggrievement. Having precised the way activists experience aggrievement, we now present the way mobilization is transformed into a loss for the industry. We assume a very simple relationship between mobilization and the harm made to the industry by activists which is the following:

$$h = p^* = \text{Max}\left[0, \frac{x - \mu}{2x - \frac{1}{2}(\mathbb{E}[c] - \bar{c})^2}\right]$$

Thus the harm made to the industry by activists is simply the proportion of individual who mobilize. As we have seen above, this harm is increasing or decreasing in heterogeneity depending on the level of aggrievement. It is decreasing in the fixed cost of mobilization. It increases in aggrievement, which itself increases in the expected cost of the project and decrease in \bar{c} . Since we expressed the equilibrium level of participation and the loss made to the industry from the mobilization, we can move back to the first stage of the game, where the regulator accepts or not the project.

Public regulation with activists opposition

We now consider the regulator's decision whether to reject the project when it is bad. If it does, the activists will not mobilize. The activists know the bias of the regulator and the two values that c can take, thus when the regulator accepts a project the activists know that $(1 + \alpha)v - c_H > 0$ or $(1 + \alpha)v - c_L > 0$, therefore

¹²High expected value of the cost

the choice of acceptance or not of a project conveys no information for the activist regarding the probabilities that the project is high or low. Therefore they do not revise their priors and keep their assessment of the expected cost of the project $\mathbb{E}[c]$. Therefore accepting a project as no informational content for the activists and the regulator anticipate that the damage done by the mobilization would be h . Thus the welfare in case of acceptance of a bad project is

$$V = (1 + \alpha)[vb - h] - c_H b \quad (3.3)$$

While if the project is good the activists may still mobilize resulting in the total damage h for the industry. Therefore the welfare in case of acceptance of a good project is

$$V = (1 + \alpha)[vb - h] - c_L b \quad (3.4)$$

In order to illustrate the impact of activists, we derive the behavior of a biased regulator in the case where there are no activists and compare it to the case where there are. If there were no activists, the regulator accepts a bad project if its bias is above the following threshold

$$(1 + \alpha)vb - c_H b \geq 0$$

$$\alpha \geq \tilde{\alpha} \equiv \frac{c_H}{v} - 1$$

When there are no activists, the threshold at which the regulator accepts any project does not depend on the size of the project (b). However, in the presence of activists, the regulator must account for their potential damages on the firm's profit. It thus uses equation 3.3 in its choice of accepting or not the project. The minimum bias above which the regulator accepts a bad project becomes

$$\alpha \geq \tilde{\alpha}_{act} \equiv \frac{c_H b}{vb - h} - 1 \quad (3.5)$$

Where h is the endogenously determined level of harm the activists inflict to the firm in case of acceptance of a bad project. This threshold can be rewritten as follows:

$$\tilde{\alpha}_{act} \equiv \frac{c_H b (2x - \frac{1}{2}(\mathbb{E}[c] - \bar{c})^2)}{vb(2x - \frac{1}{2}(\mathbb{E}[c] - \bar{c})^2) - x + \mu} - 1$$

Equation 3.5 fully characterizes the activists impact on the regulator. For any $h \geq 0$, we have $\tilde{\alpha}_{act} \geq \tilde{\alpha}$. Thus when there are activists, the regulator with level of bias $\alpha \in [\tilde{\alpha}, \tilde{\alpha}_{act}]$ switch his behavior. Because of the activists and their mobilization, the regulator decides to refuse the bad project while it would have accept it if there were no activists. Therefore, the higher this threshold, the bigger is the influence of activists.

The impact of the damage done by the activists on this threshold is straightforward as it increases it at an increasing rate. The findings on the impact of the relation between participation and activists characteristics also apply for the relation between activists characteristics and their impact on the regulator's switching threshold. Thus, the switching threshold is increasing in activists aggrievement and decreasing in the cost of mobilization (μ). Activists with high levels of aggrievement are thus more effective, but their effectiveness decreases in the fixed cost of mobilization.

The impact of the activists can be stated as follow: their presence counterbalance the bias of the regulator if the latter falls below $\tilde{\alpha}_{act}$. In this case, because their mobilization would create too much damage to the industry, the regulator decides to refuse the bad project and thus choose the first best option. Therefore, activists being successful imply that they do not mobilize. It is the threat of their mobilization that makes them successful. However, when the regulator have a bias above $\tilde{\alpha}_{act}$, then the activists have no impact on the regulator's decision. The threat of their mobilization not being high enough, the regulator accepts the bad project. The activists mobilize against it but the firm implements the project anyway. In this scenario, the activists actually end up decreasing the welfare. An impact which is detailed in the following subsection.

Welfare impact of activists

We now study the welfare impact of the activists mobilization. And specifically see if their mobilization is welfare improving or not. We consider first the case of a

bad project and compare the situations with and without activists. If there were no activists, the welfare would be $(1 + \alpha)vb - c_H b < 0$. If there are activists, we must consider 2 alternatives: in the first case, the activists are not powerful enough to change the regulator's decision (i.e $\alpha > \tilde{\alpha}_{act}$) while in the second case, the activists mobilization succeed (i.e $\alpha \leq \tilde{\alpha}_{act}$). In the first case the welfare is the following:

$$V = (1 + \alpha)(vb - h) - c_H b$$

The case of an unsuccessful mobilization against a bad project is the worst outcome of the game. The regulator already took a non optimal decision because the bad project is accepted and the activists mobilize which harm the industry even though it has no impact on the decision to continue or abandons the project. On the other hand, if the threat of mobilization is high enough ($\alpha > \tilde{\alpha}_{act}$), then the regulator chooses to reject the project and the first best outcome is realized. Therefore, the impact of activists on welfare depends on both the harm they can inflict on the firm's profit and how biased is the regulator. As we have seen above, more aggrieved, homogeneous activists are able to mobilize more, this moves upward $\tilde{\alpha}_{act}$ and thus improve the likelihood that the activists are welfare improving. On the other hand, high costs of mobilization and heterogeneous activists are more likely to be unsuccessful and thus are more likely to be welfare decreasing.

We now consider the case of a good project. A good project should always be accepted by the regulator because it yields a positive welfare. However, activists may still mobilize because they feel aggrievement or because of the heterogeneity in their costs of mobilization some activists feel positive utility from mobilizing. In this case, their mobilization is welfare decreasing because they inflict harm to the firm and thus reduce the first-best welfare level.

Summary

In this simple model we modeled mobilizations against a project as the sum of individual decisions. We did so in order to specify the mechanism by which the activists mobilize against a project. Contrary to Daubanes and Rochet (2016) we do not have a lobbying process, that means the weight the regulator puts on the industry profit (α) is fixed. However we can have unsuccessful mobilization, that is the activist threat is not strong enough to force the industry to abandon the project. We show that the activists mobilization is effective (the regulator does not accept the project) if the regulator's bias is below some threshold which depends on activists mobilisation. Then the activist do not mobilize as the project is refused because of their threat. However if the regulator's bias is above the threshold, the project is accepted and activists mobilize. We show that in the latter situation, activism is welfare decreasing, while when they do not mobilize, they are welfare improving.

Extensions

Endogenous project size

In this extension, we allow for the project size b to be endogenous. This introduces a new stage in the game which takes place at its very beginning. In this stage, the firm will be allowed to choose the size of the project b . Once the project size is selected the game that follows is the same as presented in the previous section. Thus the regulator will accept or not the project and the activists mobilize or not. The size of the project impacts two features of the model: the profit of the industry is greater as the project size increases. But also the expected cost that the project imposes on the society ($\mathbb{E}[c] = b(p_H c_H + p_L c_L)$). The problem of the industry is the following

$$\text{Max}_b \Pi = \mathbf{1}_{\text{accept}}(b)(vb - h(b)) + \mathbf{1}_{\text{reject}}0$$

Where $\mathbf{1}_{\text{accept}}$ takes the value 1 if the project is accepted and 0 if it is not. We know that the mobilization of activists is a function of the expected cost of the project,

which in this case depends on the size of the project ($\mathbb{E}[c] = b(p_H c_H + p_L c_L)$). Thus by deciding the size of the project, the firm can also anticipate the level of mobilization ($h = (\mathbb{E}[c](b))$). If the project is good, the industry knows that it will be accepted regardless of its pro industry bias, however if the project is bad, then it may be rejected. The industry knows that the regulator will accept a bad project if

$$(1 + \alpha)(vb - h(b)) - c_H b \geq 0$$

When choosing the size of the project, the firm maximize its expected profit

$$\Pi = p_L(vb - h(b)) + p_H \mathbf{1}_{vb-h(b) \geq \frac{c_H h(b)}{1+\alpha}}(vb - h(b))$$

$$\Pi = (vb - h(b))[p_L + p_H \mathbf{1}_{vb-h(b) \geq \frac{c_H h(b)}{1+\alpha}}]$$

Derivating this expression with respect to b yields

$$\frac{\partial \Pi}{\partial b} = (b - h'(b))[p_L + p_H \mathbf{1}_{vb-h(b) \geq \frac{c_H h(b)}{1+\alpha}}] = 0$$

Since the second term of this product is always positive, we have that $b = h'(b)$. The the optimal size of the project the size that equals the marginal gain of the industry to the marginal loss that the activists cause to the industry. However, the industry is constrained in its choice as it must not set the size b too high because it would trigger the mobilization and force the regulator to refuse the project. Therefore the industry must choose between profit maximization and the threat of the project being refused because it would generate a great mobilization.

Inter-group complementarity

We now allow for the population to be composed by more than one group. For simplicity we allow for the existence of two groups. The reason for this is that we want to seek the impact of inter-group complementarity on participation to the mobilization. To do this assume that group's i participation is influenced by the participation of group k and thus exhibits inter-group complementarity. To formally

implement this type of complementarity we use a CES function, which transform the participation decision for an individual j in group i into the following equation:

$$[(p^i \lambda^i a^i)^{1-\sigma} + (p^k \lambda^k a^i)^{1-\sigma}]^{\frac{1}{1-\sigma}} - \mu - \varepsilon^{ij} \geq 0$$

Here not only the participation level of group i influences the decision of individual j , but also the participation level of group k . Where $\sigma \in \{[0, 1) \cup (1, +\infty)\}$ measures the degree of complementarity between the two group's participation rate. The equilibrium participation rate in group i is then¹³

$$p^i = Pr(\varepsilon^{ij} \leq [(p^i \lambda^i a^i)^{1-\sigma} + (p^k \lambda^k)^{1-\sigma}]^{\frac{1}{1-\sigma}} - \mu) \equiv F^i([(p^i \lambda^i a^i)^{1-\sigma} + (p^k \lambda^k)^{1-\sigma}]^{\frac{1}{1-\sigma}} - \mu) \quad (3.6)$$

However, with this formulation we can't obtain a closed form solution for p^{i*} , therefore the equilibrium participation rate is approached by simulations¹⁴ and its evolution with respect to the complementarity parameter σ is presented in figure 3.2¹⁵. This figure show how ceteris paribus, the equilibrium participation rate evolves when the complementarity between groups increases. The relationship between the equilibrium participation rate and the complementarity parameter is non monotonous as there is a strong positive relationship between σ and p^{i*} on the $[0, 1)$ segment. On this segment, any value of σ imply a higher participation in group i than if there were no inter-group complementarity. We then see a jump downward when σ reaches 1. Then the positive relationship between σ and p^{i*} restart on the $(1, +\infty)$ segment but it is much weaker than on the previous segment and the resulting participation rate in group i is lower than if there were no inter-group complementarity. This implies that using this formulation, inter-group complementarity can be powerful tool for mobilizing activists from different groups, for values of $\sigma \in [0, 1)$. But it can also lead to lower levels of mobilization, for values of $\sigma \in (1, +\infty)$

¹³The equilibrium exist, as the function $F(p^i) : [0, 1] \rightarrow [0, 1]$ and is continuous, then by the Brouwer fixed point theorem, a fixed point exists.

¹⁴with 10^{-3} precision

¹⁵The equilibrium participation rate is obtained using $\lambda^i = \lambda^k = 0.5$, $\mu = 1$, $a^i = a^k = 0.5$ and $\varepsilon^{ij} \sim U[-1, 1]$

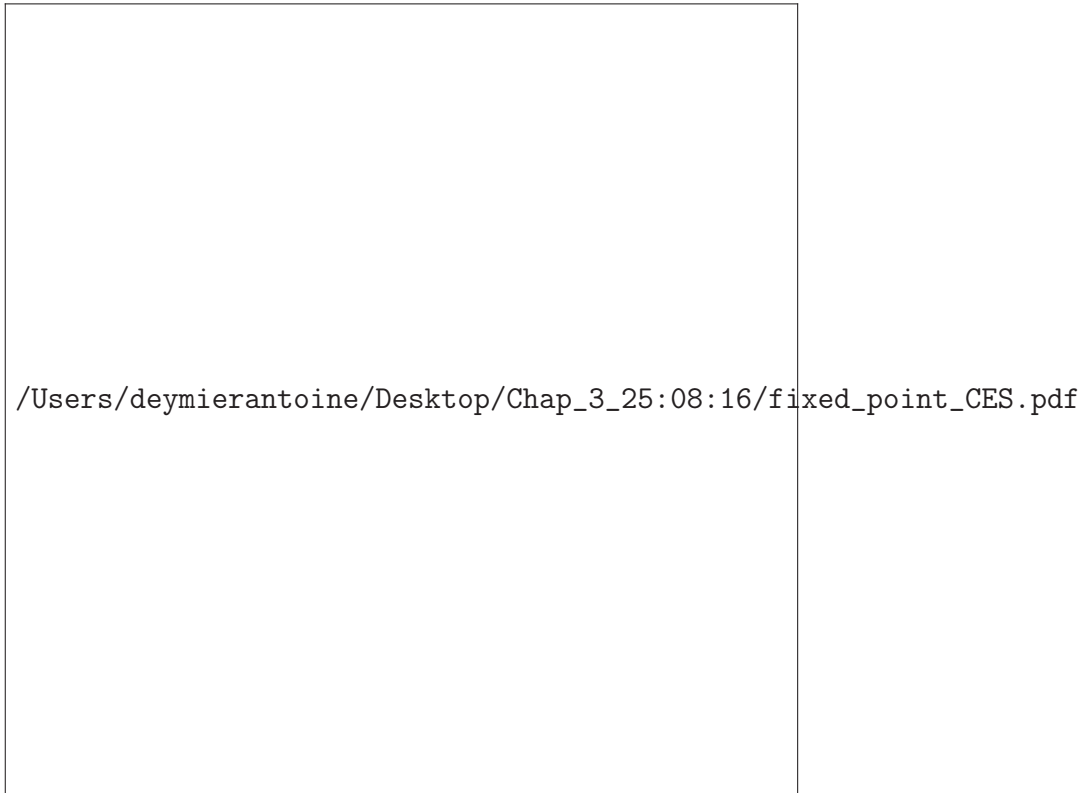


Figure 3.2: participation rate with inter-group complementarity

3.4 Conclusion

In this paper I took the Daubanes and Rochet (2016) framework of NGO activism and extended the NGO side of their model. Instead of considering an NGO as a single entity, I considered that it is the sum of many individuals who each take the decision to participate or not in a mobilization. The mobilization mechanism relies on Passarelli and Tabellini (2013) framework. Doing so allows us to revise the result of Daubanes and Rochet (2016) that NGO mobilization is always successful, as our model can have unsuccessful mobilizations. These unsuccessful mobilizations are the result of low levels of aggrievement, great heterogeneity among activists and highly biased regulator.

Conclusion générale

Conclusion générale

Dans le monde entier, les enjeux environnementaux se font de plus en plus pressant. Pollution de l'air, de l'eau, extinction d'espèces, changement climatique... sont autant de problèmes qui remettent en question notre mode de vie actuel. Les ONG environnementales ont été parmi les premiers acteurs qui ont mis en évidence l'urgence de ces problèmes.

Celles-ci ont pris une autre dimension à la suite des années 60 dans les pays occidentaux. Porté par l'esprit de révolte de l'époque, le mouvement environnemental moderne s'est structuré autour d'organisations, de penseurs, de scientifiques qui ont fait de la protection de l'environnement le combat de leurs vies. Au travers de trois essais, nous avons analysé trois situations dans lesquelles des ONG interagissaient avec des acteurs devant prendre des décisions concernant l'environnement. Dans trois cadres différents nous avons exploré par quels moyens les ONG pouvaient mettre l'environnement au coeur des décisions d'acteurs institutionnels ou privés malgré leur éloignement du pouvoir décisionnel. Nous avons mis en évidence ces interactions entre ces acteurs et les ONG à l'aide d'outils théoriques et empiriques.

Le sujet de cette thèse étant l'étude d'acteurs prenant part à un mouvement social, le parti pris a été de ne pas restreindre la littérature de base aux seules études économiques s'étant penchées sur la question mais plutôt de l'enrichir à partir d'études provenant d'autres sciences sociales. Le but étant de synthétiser l'ensemble des résultats dans une analyse économique. L'utilisation de nouvelles méthodes pour la récolte de données participe aussi à l'originalité de ce travail.

L'influence des ONG

La question centrale de cette thèse est de mettre en évidence l'impact des ONG. Dresser une liste exhaustive de leurs impacts est au-delà de la portée de cette thèse, tant celle-ci est vaste et multidimensionnelle. Nous nous sommes donc concentré sur des situations particulières dans lesquelles des acteurs interagissent avec des ONG. Nous avons analysé l'impact des ONG comme le changement de comportement de ces acteurs lorsqu'ils interagissent avec ces ONG.

Dans un premier temps nous nous sommes intéressés à l'impact des ONG sur le niveau d'attention d'un gouvernement à l'aide d'un modèle et d'un travail empirique portant sur les Etats-Unis sur la deuxième partie du XX^{me} siècle. Nous montrons que les ONG, de part leurs activités parviennent à augmenter l'attention d'un gouvernement aux questions environnementales, mesurée ici par le nombre de propositions de lois par années. Ce constat se fait à partir de données issues d'articles de journaux rapportant les activités d'ONG environnementales. C'est alors posé la question de la relation entre activité des ONG et couverture médiatique.

C'est cette relation que nous avons exploré à l'aide d'un modèle théorique prenant en compte le contexte concurrentiel des médias. Nous montrons que la concurrence entre médias pousse les journaux à se différencier sur leur stratégie de couverture médiatique des événements environnementaux et donc des activités des ONG. Ainsi, par le jeu de la concurrence, un média se spécialise dans l'écriture de nouvelles environnementales tandis que l'autre média se concentre sur d'autres types d'articles. La vérification empirique de cette prédiction a demandé la construction d'une base de données originale sur les activités de plusieurs ONG françaises et leurs couvertures médiatique dans deux quotidiens nationaux du 1^{er} Janvier 2013 au 31 Décembre 2016. Grâce à cette base de données nous avons confirmé les implications du modèle théorique. Nous montrons que la couverture médiatique des ONG diffère grandement selon les médias, selon le profil de l'ONG et selon la valeur informative de leurs activités. De même nous montrons que certaines périodes sont plus propices à

la présence d'ONG dans les médias, notamment en fin d'année lors des conférences COP.

Lors de cette période d'étude, deux évènements impliquant des ONG ont particulièrement été relayé dans les médias français, les cas des contestations de l'aéroport de Notre-Dames-des-Landes (2013) et du barrage de Sivens (2013). Ces deux cas présentent de fortes similitudes: deux constestations d'activistes environnementaux face à des projets publics ne prenant pas assez en compte leurs externalités environnementales. Nous avons analysé l'impact de ces mobilisations sur le comportement du régulateur ainsi que les propriétés en termes de bien-être de la société. Nous montrons que par leur mobilisation, les activistes peuvent compenser le manque d'attention du régulateur aux externalités environnementales et le pousser à choisir l'option du first-best. Ce résultat repose sur la condition que la mobilisation des activistes soit suffisamment forte pour pousser le régulateur à changer son comportement. Dans le cas contraire, la mobilisation fait diminuer le bien-être de la société puisqu'elle inflige des pertes et ne fait pas changer le comportement du régulateur. Cette thèse participe à la littérature grandissante en économie sur l'influence des ONG environnementales, nous avons montré dans trois essais de quelle manière des ONG peuvent influencer des acteurs à prendre en compte l'environnement dans leurs actions et ainsi changer leurs comportement.

De manière générale, cette thèse met en avant l'influence dite *indirecte* des ONG, c'est à dire celle qui ne provient pas de dons monétaires (Grossman and Helpman (1994)). Cette influence a été modélisée par des manifestations de citoyens (chapitre 1 et 3) ou plus généralement par une activité de communication (chapitre 2). En revanche, un aspect non étudié dans ce travail concerne la relation entre activité des ONG et préférences des individus pour l'environnement. Or cet aspect est crucial si l'on veut avoir une compréhension globale de l'impact de ces organisations. Une importante contribution dans ce domaine est Yu (2005). En revanche ce dernier fait l'hypothèse que la population a une réaction homogène face à une information émise par une ONG environnementale. Cependant de nombreuses études tendent

à montrer que des individus peuvent avoir des réactions opposées face à une même information, particulièrement pour des informations touchant à l'environnement ¹⁶. La présence de ces mécanismes comportementaux rendent les approches expérimentales et comportementales d'autant plus pertinentes pour affiner les résultats sur les impacts des ONG environnementales

¹⁶voir par exemple McCright and Dunlap (2011) et Gauchat (2012)

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Résumé chapitre

Chapitre 1

Ce premier chapitre explore la concurrence entre ONG qui défendent différentes causes (environnement, droit des femmes,...) dans le but d'obtenir l'attention du régulateur. Le modèle met en évidence les différentes stratégies adoptées par les ONG dans le but d'obtenir cette attention. Nous montrons que si la cause défendue est soutenue par la population (niveau de préférence élevé) alors l'ONG va investir la majeure partie de ses efforts dans l'organisation de manifestations auxquelles la population peut prendre part. Si dans le cas contraire, la cause défendue n'est pas populaire parmi la population, alors l'ONG va investir une plus grande partie de ses efforts dans la sensibilisation de la population. L'estimation empirique montre que la visibilité des problèmes environnementaux aux Etats-Unis est une des variables déterminant le niveau d'attention du gouvernement aux problèmes environnementaux.

Chapitre 2

Le deuxième chapitre explore la relation entre activité des ONG et leurs couverture médiatique. Il considère les médias comme des acteurs opérant dans un environnement concurrentiel et les ONG comme créateurs d'évènements environnementaux. La concurrence entre les médias les force à différencier leurs produits de sorte que un média va écrire plus d'articles traitant de sujets environnementaux que l'autre. Cela a pour conséquence que les activités des ONG seront couvertes de manières bien différentes suivant le média. Les ONG peuvent néanmoins influencer leur couverture médiatique lorsqu'elles ont une bonne réputation et lorsqu'elles effectuent des activités à forte valeur informationnelle. Ces prédictions empiriques sont confirmées sur un échantillon d'ONG et de médias français.

Chapitre 3

Le troisième chapitre porte sur la mobilisation d'activistes contre un projet profitant à une industrie mais ayant des externalités environnementales. Il considère cette mobilisation comme la somme de décisions d'individus hétérogènes et explore les mécanismes derrière ces décisions et notamment l'impact de la mobilisation sur le comportement du régulateur qui accepte ou non la mise en place du projet. Cette mobilisation, si elle est suffisamment forte, permet d'éviter aux projets ayant un effet net négatif sur le bien-être de la société d'être acceptés par le régulateur. Il met aussi en évidence l'impact des activistes sur le bien-être de la société, ainsi si ces derniers sont efficaces alors ils permettent une amélioration du bien-être car ils empêchent les mauvais projets d'être mis en place. En revanche s'ils ne sont pas efficaces, alors leurs actions font diminuer le bien-être.

Résumé

Cette thèse aborde la question de l'influence des ONG environnementales à l'aide de l'analyse économique. Elle étudie des situations dans lesquelles ces organisations interagissent avec d'autres acteurs dans le but d'influencer leurs décisions. Un premier chapitre s'intéresse à la concurrence entre différentes ONG pour obtenir le soutien de la population et l'attention du régulateur. Un deuxième chapitre étudie la relation entre activité des ONG et leurs couverture médiatique. Il met en avant les mécanismes de concurrence entre médias qui aboutissent sur différentes stratégies de couverture médiatique des activités des ONG suivant les médias. Le dernier chapitre porte sur la mobilisation d'activistes contre un projet public présentant des externalités environnementales.